

**U.S. Army Research Institute
for the Behavioral and Social Sciences**

Bibliography of Publications

**Fiscal Years
2000-2015**



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Fiscal Years 2000-2015

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Introduction

The primary responsibility of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is to maximize Soldier effectiveness. ARI accomplishes its mission through research and development in the acquisition, training, utilization, and retention of Army personnel. ARI research and products affect every Army mission with a human performance component.

The means of dissemination of the results of ARI's research and development studies and analysis program vary widely depending on the type of research, the subject matter, and the sponsor or proponent. Typically, major findings with immediate policy and procedural implications are briefed to sponsors and proponents in order to enable timely implementation. This is followed up with complete documentation in the form of research and technical publications. In many cases, these documents represent the actual item handed off to the sponsor or proponent; this is particularly true of the Research Product category. In other cases, results are published in order to provide a complete record of the research accomplished and for future reference by researchers doing research in the same or similar areas.

This bibliography provides an idea of both the depth and scope of the ARI FY00-FY15, (October 1, 1999 to September 30, 2015), research efforts, and is a valuable resource for anyone interested in military psychology from either a scientific or operational perspective.

The abstracts were written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is often used to effectively communicate the details of research conducted. The bibliography includes a title listing, bibliographic citations with abstracts, and author indexing.

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Technical Report (TR). A report of completed research intended primarily for dissemination to researchers. Technical Reports published by ARI are intended for sponsors of research and development tasks and for other research and military agencies.

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Special Report (S). A published report on a topic of special interest or in-house research intended primarily for dissemination to a select audience.

Study Report (SR). A published report briefly documenting studies and analyses.

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Research Note (RN). An interim or final report typically of limited interest outside of ARI. Research Notes may contain material related to a Research Report or Technical Report (e.g., detailed tables, graphs, charts, sample forms, and sample training and testing materials) published as a Research Note.

Contractor Report (CR). An interim or final report by a contractor that meets contractual obligations but is not defined by the other report categories.

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Special Reports

S 40	ARI's Stakeholder Analysis: Findings, Issues, and Recommendations
S 41	Matching Recruits to Jobs: The Enlisted Personnel Allocation System
S 42	Foundations of the After Action Review Process
S 43	ARI Survey Programs: An Outside Look
S 44	Shooting Straight: 20 Years of Rifle Marksmanship Research
S 45	Training for Performance: The Structured Training Approach
S 46	Human Relations Update 2000. Volumes 1 & 2
S 47	Training Challenges for Digitization
S 48	Women in the Army: An Annotated Bibliography
S 49	Distance Learning: The Soldier's Perspective
S 50	Cancelled
S 51	What We Know About AWOL and Desertion: A Review of the Professional Literature
S 52	Selection for Leadership: Transforming NCO Promotion
S 53	Training for Future Operations: Digital Leaders' Transformation Insights
S 54	U.S. Army Research Institute: FY 2003 Program
S 55	U.S. Army Research Institute Program in Basic Research: FY 2002 & FY 2003
S 56	Enhancing U.S. Army Aircrew Coordination Training
S 57	Project Train Mod: Modernizing Soldier Training Through Research
S 58	Digital Skills Training for Net-Centric Operations
S 59	Virtual Environments for Infantry Soldiers
S 60	U.S. Army Research Institute: FY 2004 Program
S 61	Planning for the Future: Progress Toward an NCO Competency Assessment Program
S 62	U.S. Army Research Institute Program in Basic Research: FY 2004
S 63	Distance Learning: A Way of Life-Long Learning
S 64	U.S. Army Research Institute: FY 2006 Program
S 65	U.S. Army Research Institute Program in Basic Research: FY 2005 & FY 2006
S 66	U.S. Army Research Institute Program in Basic Research: FY 2007
S 67	Cancelled
S 68	Training Small Unit Leaders and Teams
S 69	U.S. Army Research Institute Program in Basic Research: FY 2010
S 70	Select for Success: A Toolset for Enhancing Soldier Accessioning
S 71	Cross-Cultural Competence in the Department of Defense: An Annotated Bibliography
S 72	Army Sociocultural Performance Requirements
S 73	Foundational Research in Behavioral and Social Sciences: Marching Towards the Future

Technical Reports

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TR 1099	Identifying Conceptual Skills of Future Battle Commanders
TR 1100	An Annotated Bibliography of Recruiting Research Conducted by ARI
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TR 1103	Training Dismounted Soldiers in Virtual Environments
TR 1104	Platoon Readiness as a Function of Leadership, Platoon, and Company Cultures
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TR 1106	Predicting Marksmanship Performance with the Laser Marksmanship Training System
TR 1107	Applying Collaborative and E-Learning Tools to Military Distance Learning
TR 1108	Specifications for a Two-Tiered Classification System for the Army: Volume 1
TR 1109	An Annotated Bibliography of Recruiting Research Conducted by Foreign Services
TR 1110	Instructional Strategies for Training Teams in Virtual Environments
TR 1111	Leadership Development: A Review of Industry Best Practices
TR 1112	Effect of Viewing Conditions on Sickness & Distance Estimation in a Virtual Environment
TR 1113	Cognitive Behaviors for Computer Generated Forces
TR 1114	Enhancing the Efficiency of Tank Gunnery Evaluation: A Strategy Revisited
TR 1115	Applying Digital Technologies to Evaluation: A Focus on Command and Control
TR 1116	Assessing and Measuring Training Performance: 2000 Workshop
TR 1117	Defining Digital Proficiency Measurement Targets for U.S. Army Units
TR 1118	Team Performance in Distributed Virtual Environments
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TR 1122	Evaluating an Approach to Military Operations in Urban Terrain Decision Skills Training
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TR 1126	Analog Scales as Temperament Measures in the Baseline Officer Longitudinal Data Set
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TR 1128	Development of Predictor and Criterion Measures for the NCO ²¹ Research Program
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TR 1148	Competency Based Future Leadership Requirements
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TR 1151	Army Enlisted Personnel Competency Assessment Program. Phase 1: Volume 1
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TR 1177	Evaluation and Refinement of a Screening Instrument for U.S. Army Recruiters
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TR 1345	Identifying Dynamic Environments for Cross-Cultural Competencies
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RR 1746	A Trial Program for Selection to Infantry Training Brigade Company Command
RR 1747	The Changing U.S. Army: A Summary of Future Focused Reports
RR 1748	Force XXI Training Program Digital Project
RR 1749	Lessons Learned on Sights & Devices in the Land Warrior Weapon Subsystem
RR 1750	Attrition in the Army from the Signing the Contract through 180 Days of Service
RR 1751	The Computer Background of Infantrymen: FY 1999
RR 1752	Operational Assessment of Force XXI Training Products
RR 1753	Modeling and Measuring Situation Awareness in the Infantry Operational Environment
RR 1754	Analysis of Mission Based Scenarios for Training in Virtual Environments
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RR 1759	Commanders' Integrated Training Tool for the Close Combat Tactical: Trainer 2
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RR 1762	The Computer Background of Soldiers in Infantry Courses: FY 1999 – FY 2000
RR 1763	Refinement of Prototype Staff Training Methods for Future Forces
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RR 1769	Analysis of the USAREC Recruiting Incentive, Partnership for Youth Success
RR 1770	Measures of Platoon Leader Situation Awareness in Virtual Decision Making Exercises
RR 1771	Commanders' Survey: Armor Captains' Career Course: Distance Learning
RR 1772	Assessing and Managing User Produced Training Support Packages
RR 1773	Cognitive Psychology Principles for Digital Systems Training
RR 1774	Six Myths About Digital Skills Training
RR 1775	Assessment of Initial Delivery of the Armor Captains' Career Course
RR 1776	Decision Centered Military Operations in Urban Terrain Training for Small Unit Leaders
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SR 2003-07	Assessment of the Basic Officer Leader Course. Phase 1: FY 2001
SR 2003-08	Off Line Field Test Design for Evaluating Two Approaches to Person Job Matching
SR 2004-01	Applying a Multi-Skilled Soldier Concept to the Stryker Brigade Combat Team
SR 2004-02	Basic Officer Leader Course: Recommendations on the Phase 2 Program
SR 2004-03	Linguist Training and Performance
SR 2004-04	Method for Estimating Army Aptitude Area Composites
SR 2004-05	Attrition from Technical Training School Data: Method and Simulation Results
SR 2005-01	Alternative Aptitude Area Composites and Job Families for Army Classification
SR 2005-02	Reenlistment Behavior: The Effects of Army's Selective Reenlistment Bonus
SR 2005-03	Summative Evaluation of Helicopter Gunnery Training
SR 2005-04	Sergeants as Drill Sergeants: Returning Sergeants to Drill Sergeant Duty
SR 2006-01	A Self-Assessment Program in Support of Soldier Competency Assessment
SR 2006-02	The Army Training and Leader Development Panel Report: Consolidation Phase
SR 2006-03	Advanced Individual Training Command and Cadre Perceptions and Attitudes
SR 2006-04	Evaluating the Contributions of Virtual Simulations to Combat Effectiveness
SR 2006-05	Evaluation of the U.S. Army Training & Doctrine Command Warrior Transition Course
SR 2006-06	Pilot Study to Examine Training Eligibility Standards
SR 2006-07	Effects of Motion on Skill Acquisition in Future Simulators
SR 2006-08	Incorporating Lessons Learned into the Army Competency Assessment Prototype
SR 2006-09	Assessment of the Basic Officer Leader Course. Phase 2: FY 2005
SR 2007-01	Immersive Simulation Training for the Dismounted Soldier
SR 2007-02	Increasing the Enlistment Bonus Cap and MOS Channeling Effects
SR 2007-03	Assessment of the Basic Officer Leader Course. Phase 2: FY 2006
SR 2007-04	Assessing Knowledge, Skills, and Attributes for Future Force Soldiers
SR 2007-05	U.S. Army Classification Research Panel: Conclusions and Recommendations
SR 2007-06	Assessment of the New Basic Combat Training Program of Instruction
SR 2008-01	Cross-Cultural Competence in Army Leaders: A Conceptual and Empirical Foundation
SR 2008-02	Longitudinal Junior Noncommissioned Officer Promotion Analysis
SR 2008-03	Attitudes and Career Intentions of Active Army Soldiers Without a GWOT Deployment
SR 2008-04	Building Cultural Capability for Full Spectrum Operations
SR 2008-05	Program Evaluation Metrics for U.S. Army Lifelong Learning Centers:
SR 2008-06	Transfer and Generalizability of Foreign Language Learning
SR 2008-07	Drill Sergeant Candidates' Experience and Training with Warrior Tasks
SR 2009-01	Investigation of the Ten Week Basic Combat Training Pilot Program: FY 2008
SR 2009-02	Mobile Training Teams to Deliver Noncommissioned Officer Education Courses

SR 2009-03	Warrior Task Skills Retention Assessment
SR 2009-04	The Impact of Basic Noncommissioned Officer Course Attendance on Promotion Timing
SR 2009-05	Noncommissioned Officer Education System: Considerations for Testing-Out
SR 2009-06	Predicting Disenrollment of Four-Year Scholarship Recipients from ROTC
SR 2009-07	Evaluating the Enlisted Aides Selection Assessment: Final Report
SR 2009-08	Identifying Incentives to Increase the Retention of Army Medical Department Clinicians
SR 2009-09	Influences on the Decision-Making Process of Noncommissioned Officers
SR 2010-03	Impact of Game-Based Training on Classroom Learning Outcomes
SR 2010-02	Game-based training effectiveness evaluation in an operational setting
SR 2010-03	Distributed Learning in Foreign Language Education
SR 2011-01	Identification and Accessioning of Individuals for the Officer Candidate School
SR 2011-02	Identification of Brigade Command Competencies
SR 2014-01	Collective Leadership Measurement for the U.S. Army

Study Notes

SN 2000-01	Factors for Determining the Army's Role in MSO Design / Redesign
SN 2001-01	The Effect of Reducing the Number of Tests in the ASVAB
SN 2002-01	Update of ARI's Officer Personnel Research Databases: 1999 – 2000
SN 2002-02	Investigations Related to the Implementation of the Assessment of Individual Motivation
SN 2003-01	Evaluation of the Buddy Team Assignment Program
SN 2003-02	Determining Composite Validity Coefficients for Army Jobs and Job Families
SN 2003-03	Determining Mean Predicted Performance for Army Job Families
SN 2003-04	Cancelled
SN 2003-05	Impact of the ACES on Soldier Retention and Performance: Database Development
SN 2003-06	Impact of the ACES on Soldier Retention and Performance. Plan Development
SN 2004-01	Assessing Knowledge, Skills, and Attributes for Objective Force Soldiers
SN 2004-02	Principles for Defining Multi-Skilled Jobs Based on Mission Requirements
SN 2004-03	Understanding and Improving the AIM in the Army's GED Plus Program
SN 2004-04	Fairness of Army ASVAB Test Composites for MOS and Job Families
SN 2004-05	Update of ARI's Officer Personnel Research Databases: 2001 – 2002
SN 2004-06	Comparison of Alternative Methods of Measuring ASVAB Test Composite Fairness
SN 2004-07	Examining the ASVAB Renorming upon Selection and Classification in the Army
SN 2005-01	Examining Training Eligibility Standards: Four Case Studies
SN 2005-02	Results and Recommendations from a Survey of Army Deserters and Leaders
SN 2005-03	A Strategy to Produce Realistic, Cost-Effective Measures of Job Performance
SN 2005-04	Army Selective Reenlistment Bonus Management System
SN 2006-01	Concurrent Validation of the NLSI for U.S. Army Drill Sergeants
SN 2006-02	Cancelled
SN 2006-03	Alternative Aptitude Area Composites and Job Families for Army Classification
SN 2006-04	Update of ARI's Officer Personnel Research Databases: 2003 – 2004
SN 2006-05	The value of ACES Programs and Services to the Army's Current and Future Force
SN 2007-01	Modeling Army Applicants' Job Choices
SN 2007-02	Army SRB Program: Estimates on Retention and Length of Reenlistment
SN 2007-03	Econometric Estimates of Army Retention
SN 2007-04	Updating ARI's Educational Benefits Usage Databases: 2005 – 2006
SN 2009-01	Updating ARI's Educational Benefits Usage Databases: 2006 – 2007
SN 2009-02	Findings & Recommendations of the Warrior Task Skills Retention Assessment
SN 2009-03	Identifying Incentives to Increase the Retention of Army Medical Clinicians: Appendices
SN 2009-04	Updating ARI's Educational Benefits Usage Databases: 2007 – 2009
SN 2009-05	The Relationship between Enlisted Deployment and Retention
SN 2010-01	Usability of Wearable and Desktop Game-Based Simulations: A Heuristic Evaluation
SN 2011-01	Updating ARI's Educational Benefits Usage Databases: 2009 – 2010
SN 2011-02	Development and Validation of Measures for Selecting Soldiers for OCS
SN 2014-01	Identification and Accessioning of Individuals for OCS

Contractor Reports

CR 2004-01	Development of Officer Leadership for the Army: Preliminary Results
CR 2004-02	Working Memory Influences on Long Term Memory and Comprehension
CR 2004-03	Perspectives on Studying Collaboration in Distributed Networks
CR 2004-04	Situational Awareness, Simulation Training and Assessment Toolset
CR 2004-05	Dismounted Infantry Situational Awareness Tool
CR 2004-06	Automated Communications Analysis System
CR 2004-07	New Measures of Situation Awareness for VE Based Training of Small Infantry Squads
CR 2004-08	Enlistment Propensities of University Students
CR 2005-01	Best Practices in Sexual Harassment Policy and Assessment
CR 2005-02	Fielded Agent Based Geo-Analysis Network
CR 2005-03	Intelligent Terrain Analysis and Tactical Support System for Unmanned Ground Vehicles
CR 2005-04	Terrain Analysis for Human Robot Interaction: Enabling Terrain Understanding
CR 2005-05	Applying Technology to Train Visualization Skills
CR 2005-06	Meta-Information Visualization to Enhance the Common Operational Picture
CR 2005-07	Multi-Tasking Assessment for Personnel Selection and Development
CR 2005-08	Adaptive Instructional Systems
CR 2005-09	An Intelligent Tutoring System Approach to Adaptive Instructional Systems
CR 2005-10	Skill Training Using Adaptive Technology: A Better Way to Hover
CR 2005-11	Adaptive Instructional Systems
CR 2006-01	Assessment of Unit Focused Stability in the 172nd Stryker Brigade Combat Team
CR 2006-02	MAVEN-SA: Model-Based Automated Visualization for Enhanced Situation Awareness
CR 2006-03	Proceedings from the ETS and ARI Emotional Intelligence Workshop
CR 2006-04	Electronic Performance Support for Future Trainers: A Conceptual Framework
CR 2006-05	Battle Captain Advanced Team Training Development and Assessment
CR 2006-06	Scenario-based Leadership Training for Unit Task Force Staff Officers
CR 2007-01	Training Cognitive Leadership Skills in a Joint Task Force Context
CR 2007-02	Improving and Broadening SHIELD Utility
CR 2007-03	Adaptive Role-Play Exercises for a Leader Development Center
CR 2007-04	Training a Joint and Expeditionary Mindset
CR 2007-05	An Analysis of a Joint and Expeditionary Mindset
CR 2007-06	Computer Mediated Training Tools to Enhance Cognitive Leadership Skills
CR 2007-07	Virtual Observer Controller for Small Unit Infantry Leader Simulation Training
CR 2007-08	Training a Joint and Expeditionary Mindset
CR 2007-09	Enhancing Joint Task Force Cognitive Leadership Skills
CR 2007-10	The Leadership Formula: Potential, Motivation, Development
CR 2008-01	Feasibility of Developing a Common Army Helicopter Pilot Candidate Selection System
CR 2008-02	Measuring Learning and Performance in Collective Training Exercises
CR 2008-03	Tools for Creating Objects and Behaviors for Distributed Simulations
CR 2008-04	Tools for Creating Skill Training Content in Distributed Simulations
CR 2008-05	Tools for Inserting Deep Cultural Context into Mission Training Simulations
CR 2008-06	Cultural Behavior Generation
CR 2009-01	Survey Software Evaluation
CR 2009-02	Talent Maturity Assessment for the United States Army Civilian Corps
CR 2009-03	Review of Online Data Collection and Data Storage Procedures
CR 2009-04	Special Operations 360 Degree Feedback Programs: Data Analysis Plan and Results
CR 2009-05	The Impact of Knowledge on Team Development
CR 2009-06	Linguistic Geometry Techniques for Distributed Interactive Training
CR 2009-07	Automated Support for After Action Review Presentation
CR 2010-01	Measuring Organizational Learning: A Preliminary Progress Report
CR 2010-02	A Computer Mediated Learning Environment for a Joint and Expeditionary Mindset
CR 2011-01	Joint Measurement Operations Controller
CR 2011-02	Rapid Authoring of Demonstrations for eXperience
CR 2012-01	Game-based Training Research Facility
CR 2013-01	Rapid Simulation Development Processes and Tools for Job Performance Assessment

Special Reports

S 40

U.S. Army Research Institute's Stakeholder Analysis: Findings, Issues, and Recommendations. (2000). Hitchcock, R.R., & Davenport, B.A. (DTIC No. ADA376151).

The U.S. Army Research Institute (ARI) contracted with Booz-Allen & Hamilton to conduct an analysis of key issues that define the relationship between ARI and its stakeholders. There were four objectives; (1) Assess stakeholders' awareness of ARI's mission, roles, and capabilities; (2) Determine if ARI is providing the products and services needed by its stakeholders; (3) Evaluate stakeholders' satisfaction with ARI products and services; (4) Derive insights from the stakeholders to help ARI craft a proactive, long-term operational strategy. This report summarizes the methodology, findings, issues and recommendations resulting from the stakeholder's analysis. Results were used as the baseline to develop a charter and agenda for the ARI Stakeholders Advisory Board comprised of Army military and civilian leaders.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA376151>

S 41

Matching Recruits to Jobs: The Enlisted Personnel Allocation System. (2000). Lightfoot, M.A., & Ramsberger, P.F. (DTIC No. ADA382909).

This U.S. Army Research Institute (ARI) Special Report on the Enlisted Personnel Allocation System (EPAS) presents the history and current status of the Army's enlisted personnel selection and classification system. It is written for policy-makers, managers, and human resources personnel. The report includes a discussion of the theoretical and practical aspects of selection and classification testing in the context of Army operations dating back to World War I. EPAS, the optimal person-job matching software developed by ARI, is described along with its potential to improve the effectiveness of the Army's classification system.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA382909>

S 42

Foundations of the After Action Review Process. (1999). Morrison, J.E., & Meliza, L.L. (DTIC No. ADA368651).

The U.S. Army has adopted the After Action Review (AAR) as its primary method of providing feedback after unit collective training exercises. The AAR is an interactive discussion in which unit members decide what happened, why it happened, and how to improve or sustain collective performance in future exercises. Other services and organizations outside the military are also beginning to employ the AAR as a feedback tool. This report describes the twenty-five year history of AAR research and development and the major behavioral research areas contributing to AAR development and refinement. In addition, this report defines goals for future AAR research.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA368651>

S 43

U.S. Army Research Institute's Survey Programs: An Outside Look. (1999). Tourangeau, R., & Miller-Steiger, D. (DTIC No. ADA369106).

The aim of this project was to assess the quality of ARI's current survey programs, make recommendations for improving them, and to draft regulations that incorporated these recommendations and brought the regulations up to date. Information was gathered about ARI's current attitudinal, command climate, and occupational analysis studies by examining survey documentation and speaking with the staff who carry out the studies. Information was also collected about a number of comparable surveys done by the other services, academic survey organizations, and private firms, and the users of the ARI surveys were queried to assess their satisfaction with ARI's services. ARI was found to use sound methods, comparable to those used by other survey organizations and it achieved similar response rates, and ARI customers expressed a high level of satisfaction. Recommendations are made for continuing enhancement of ARI survey programs.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA369106>

S 44

Shooting Straight: 20 Years of Rifle Marksmanship Research. (2000). Evans, K.L., Dyer, J.L., & Hagman, J.D. (DTIC No. ADA384197).

The U.S. Army Research Institute (ARI) has developed numerous research products for rifle marksmanship training over the past 20 years. This report highlights ARI marksmanship research efforts during this period of time, focusing on those contributions that continue to influence Soldier training today. ARI marksmanship contributions have included program evaluation, instructional development, the design of training materials for students and instructors, systems research, training device development, and training device evaluation. Future marksmanship research questions are discussed in the areas of system integration, new systems training, and simulation training strategies.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA384197>

S 45

Training for Performance: The Structured Training Approach. (2000). Campbell, C.H., Quinkert, K.A., & Burnside, B.L. (DTIC No. ADA382969).

This report summarizes ARI's work in conducting research and development on structured training programs, discusses the uses for structured training, and presents an overview of the lessons learned and recommendations for future work. Structured training programs are characterized by a focus on selected tasks, emphasis on task performance feedback, realistic context involving simulation, documentation in the form of a training support package (TSP), and linkage to other training in a broader strategy for training. Eight of ARI's recently developed structured training programs are described as examples of the various ways the approach can be used. The report presents the design, development, and implementation processes, and discusses seven challenges to design and implementation (e.g., exportability, personnel support requirements, maintaining currency). Findings on the acceptability and effectiveness of structured training are summarized, along with first-hand comments from users in various settings. The report briefly describes six key opportunities for using structured training (e.g., refresher training for deployed units, preparation for Combat Training Center rotations, sustainment training). Finally, a summary of the lessons learned and recommendations is included. These focus on leader education, use of surge teams for training support, training flexibility, performance measurement and feedback, and links to other initiatives.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA382969>

S 46

Human Relations Update 2000. Volume 1: Findings, Conclusions, and Implications. (2001). (DTIC No. ADB291807 / Restricted).

Human Relations Update 2000. Volume 2: Appendices. (2001). (DTIC No. ADB291808 / Restricted).

S 47

Training Challenges for Digitization. (2001). Moses, F.L. (DTIC No. ADA395401).

This report outlines challenges about how best to train computer-based digital skills for future battlefield operations. It explains the foundation of Army needs, the state of current knowledge, suggests research to address the most pressing needs, and the potential benefits to the Army. Five training challenges for digitization are identified and discussed: (1) Determine digital task training requirements, (2) Train adaptability, (3) Prepare digitally-linked teams, (4) Assess skill levels of digital Soldiers, and (5) Strategies for training on demand. The report's purpose is to communicate with training managers and leaders who have to make informed decisions about how to support training for the Objective Force and the future Army.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA395401>

S 48

Women in the Army: An Annotated Bibliography. (2002). Harris, B.C., Simutis, Z.M., & Gantz, M.M. (DTIC No. ADA407786).

This report provides an overview of research, studies, and analyses performed by the U.S. Army Research Institute on the utilization and training of women in the Army. As numbers and roles of women have expanded since the All Volunteer Force began in the early '70s, a number of research projects have been completed to address both the utilization and integration of women in Army units and the training of women, particularly in the Initial Entry Training program for combat support and combat

service support Soldiers. The report also provides an annotated bibliography of research and studies conducted during the 1990s on a wide variety of issues related to women in the Army.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA407786>

S 49

Distance Learning: The Soldier's Perspective. (2002). Wisher, R.A., Sabol, M.A., Moses, F.L., & Ramsberger, P.F. (DTIC No. ADA407336).

The primary purpose of this report is to examine distance learning (DL) from the perspective of the Soldier. A summary of the history of DL describes its applications in the Army and plans for additional uses. Findings from research and comments from surveys are examined to reveal how well Soldiers accept DL as an effective teaching method within different types of training courses (e.g., small unit training versus individual professional development). The strengths and weaknesses of DL are discussed, leading to a list of recommendations to help trainers produce effective DL courses.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA407336>

S 50 — Cancelled

S 51

What We Know About AWOL and Desertion: A Review of the Professional Literature for Policy Makers and Commanders. (2002). Ramsberger, P.F., & Bell, D.B. (DTIC No. ADA407801).

Enlisted desertion rates in the U.S. Army have been increasing in recent years. A study has been undertaken to examine this issue to shed light on why desert Soldiers and what can be done to intervene and lessen its occurrence. As a first step, the literature on desertion was reviewed and summarized. The topics covered in this report include how desertion is defined and handled currently, how deserters differ from other Soldiers, the reasons for desertion found in previous research, the consequences of desertion, steps that can be taken to prevent this outcome, and what needs to be learned to assist Army decision makers and commanders as they seek to deal with this problem.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA407801>

S 52

Selection for Leadership: Transforming NCO Promotion. (2002). Campbell, R.C., & Knapp, D.J. (DTIC No. ADA407790).

The NCO21 research program was undertaken to help the U.S. Army plan for the impact of future demands on the noncommissioned officer (NCO) corps. The performance requirements and associated knowledge, skills, and aptitudes (KSAs) expected of future successful NCOs were used as a basis for developing tools that could be incorporated into an NCO performance management system geared to 21st-century job demands. This report provides a user-oriented overview of the "NCO21" project and the tools that it has produced.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA407790>

S 53

Training for Future Operations: Digital Leaders' Transformation Insights. (2003). Johnston, J.C., Leibrecht, B.C., Holder, L.D., Coffey, R.S., & Quinkert, K.A. (DTIC No. ADA412717).

This report results from a study of key factors that are likely to shape the training environment of the future force. The study aimed to translate lessons learned by digitization leaders into high-payoff recommendations for training the Objective Force. The study team interviewed senior leaders in the Army's First Digital Division and I Corps, capturing previously undocumented knowledge acquired through practical experience. Digital training experts, including two retired General Officers, then analyzed the interview transcripts to generate implications for training the future force. In the process, the experts injected their own knowledge and insights to expand the understanding of issues and requirements. Finally, the team developed specific recommendations intended to give transformation leaders a distinctive training advantage. The practical insights and recommendations point to initiatives the Army can take to establish Objective Force training as a decision combat multiplier.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA412717>

S 54

U.S. Army Research Institute: FY 2003 Program. (2002). (DTIC No. ADA412547).

The mission of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is to maximize individual and unit performance and readiness to meet the full range of world-wide Army missions through advances in the behavioral and social sciences. The purpose of this document is to describe the work that ARI will accomplish in its Fiscal Year 2003 program.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA412547>

S 55

U.S. Army Research Institute Program in Basic Research: FY 2002 & FY 2003. (2002). (DTIC No. ADA409096).

The purpose of this document is to communicate the annual progress for each individual research project in the Research and Advanced Concepts Office (RACO) basic research program at the Army Research Institute for the Behavioral and Social Sciences (ARI). The summaries contained herein are written by the scientists who are performing the work and provide a snapshot of their continuing efforts. In addition, RACO conducts a more detailed in-progress review of each project each year. If successful, the projects within RACO's basic research program will lay the foundations for many of ARI's future applied behavioral research efforts. These summaries serve as guideposts for ensuring that our basic research results transition to ARI's applied research programs.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA409096>

S 56

Enhancing U.S. Army Aircrew Coordination Training. (2003). Katz, L.C., & Grubb, G.N. (DTIC No. ADA415767).

This report summarizes the objectives and outcomes of ongoing team training research and development under the guidance of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI). The Aircrew Coordination Training Enhancement (ACTE) program is an applied research project that applies experience, innovation, and technology to research the operational issue, "Can interactive multimedia courseware using web-based distribution provide the realism and relevance necessary for effective behavior-based team training and evaluation?" The report briefly describes prototype products from the first phase of research as two interactive multimedia courses of instruction with supporting training materials for usability assessment, evaluation, and validation testing by aviation units in the field. User testing and validation results indicate high levels of acceptance for both the training and performance evaluation components. Initial testing of the prototype courseware on the Army's distance learning suite supports both the web-based and instructor facilitated delivery strategies. The final prototype courseware and support materials are ready for refinements to meet certification requirements and subsequent fielding. Training effectiveness results suggest research into applying the ACTE courseware design and delivery model to accelerate the fielding of priority training systems to meet the Army's critical training needs.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415767>

S 57

Project Train Mod: Modernizing Soldier Training Through Research. (2003). Evans, K.L. (DTIC No. ADA416475).

This report summarizes and highlights the major findings of 11 separate lines of investigation across four general areas of applied training research: training modernization (5), decision making (2), situation awareness (2), and computer-based training for digital systems. The training modernization section focuses on training research for a variety of new systems and technologies, including the Land Warrior System and the M2A3 Bradley Fighting Vehicle. The section on decision making describes the development of new computer-based training tools for learning the Military Decision-Making Process (MDMP). It also provides an overview of research aimed at teaching platoon leaders to make better decisions during urban operations. The situation awareness (SA) section highlights the creation of a comprehensive infantry SA model, as well as the development and field testing of three new SA measures. Finally, the section on computer-based training presents survey research findings on the computer backgrounds of different groups of Soldiers, as well as the results of a series of learning experiments that assessed the effectiveness of different computer-based instructional design features.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA416475>

S 58

Digital Skills Training for Net-Centric Operations. (2004). Schaab, B.B., Dressel, J.D., & Moses, F.L. (DTIC No. ADA421861).

Multiple research activities identified training methods that enhance Army net-centric operations where Soldiers use sophisticated digital systems that interact over an electronic network. Researchers collected information from Soldiers over five years, from 1999 to 2003, to understand how "going digital" changes responsibilities and training needs. Soldiers documented training preferences and shared frustrations and successes as their understanding and expertise evolved over time. This special report presents principles and recommendations, including supporting evidence from extensive experimentation and field surveys, for training Soldiers to maximize their use of digital systems. Results should help Soldiers to increase the speed and the ease of transformation to net-centric operations. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA421861>

S 59

Virtual Environments for Infantry Soldiers. (2004). Campbell, C.H., Knerr, B.W., & Lampton, D.R. (DTIC No. ADA425082).

Environments for Dismounted Soldier Simulation, Training and Mission Rehearsal. The four-year (Fiscal Years FY 99-FY 02) STO effort was proposed to address a range of U.S. Army future operational capabilities described in U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-66 (U.S. Army Training and Doctrine Command, 1997). The STO activities and goals were focused on overcoming critical technological challenges that prevented effective Infantry Soldier simulation. The U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) led a team of both government and industry developers in examining simulation capabilities for Infantry. The other government partners were the U.S. Army Simulation, Training, and Instrumentation Command (STRICOM) and the U.S. Army Research Laboratory Human Research and Engineering Directorate (ARL-HRED) and Computational and Information Sciences Directorate (ARL-CISD). Each of the major players had a particular area of interest, but all worked together to explore concepts and systems and to recommend directions for further work on training, concept development, and mission rehearsal. The overall goal for the STO was to develop a demonstration Infantry leader trainer at the fire team, squad, and platoon level. The envisioned system would include a variety of capabilities: for leader trainees to execute a series of realistic training scenarios (combat operations and support operations) in the simulator; for subordinates, other friendly forces, enemy forces, and civilians to be represented by computer-controlled or semi-automated agents; and for repeated practice, enhanced by training features, coaching, and AARs, that would build decision-making and coordination skills. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA425082>

S 60

U.S. Army Research Institute: FY 2004 Program. (2004). (DTIC No. ADA429941).

The mission of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is to maximize individual and unit performance and readiness to meet the Army operational requirements through advances in the behavioral and social sciences. The purpose of this document is to describe the work that ARI will accomplish in its Fiscal Year 2004 program. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA429941>

S 61

Planning for the Future: Progress Toward an NCO Competency Assessment Program. (2005). Campbell, R.C., Heffner, T.S., & Knapp, D.J. (DTIC No. ADA444464).

In the early 1990s, the Department of the Army abandoned its Skill Qualification Test (SQT) program due primarily to maintenance, development, and administration costs. This left a void in the Army's capabilities for assessing job performance qualification. To meet this need, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) instituted a 3-year program of feasibility research related to development of a Soldier assessment system that is both effective and affordable. The PerformM21 program has two mutually supporting tracks. The first focuses on the design of a testing program and identification of issues related to its implementation. The second track is a demonstration of concept – starting with a prototype core assessment targeted to all Soldiers eligible for promotion to Sergeant, followed by job-specific prototype assessments for several Military Occupational Specialties (MOS). <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA444464>

S 62

U.S. Army Research Institute Program in Basic Research: FY 2004. (2005). (DTIC No. ADA443858).

This document provides a listing and brief synopsis of ongoing and recently completed research efforts. Project listings are organized into the three aforementioned research objectives. It is important to note, however, that basic research is but one of many programs for which RACO has responsibility. Other programs in RACO include:

- Small Business Innovative Research (SBIR) Program,
- Small Business Technology Transfer (STTR) Program,
- International Behavioral Science and Technology Watch,
- Graduate student apprenticeship program - Consortium Research Fellows Program – with the Consortium of Metropolitan Washington Universities,
- Outreach efforts to Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs), and
- Research support in behavioral science for the U.S. Military Academy.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA443858>

S 63

Distance Learning: A Way of Life-Long Learning. (2005). Belanich, J., Moses, F.L., & Orvis, K.L. (DTIC No. ADA440146).

The instructional approach of distance learning (DL) has many benefits but has yet to reach its full potential. This report critically examines how new DL technologies and methodologies are increasing instructional opportunities. These improvements are presented as an extension of an instructional evolution beginning with Aristotle tutoring Alexander the Great, progressing through the mass education method of the industrial revolution, and continuing today with DL and individualized instruction. Summaries of ARI's research highlight progress in three areas: 1) making instruction more applicable to real-world tasks; 2) making instruction more engaging; and 3) providing improved availability and support from instructors without overloading them. The report concludes by presenting a framework for developing more effective DL with a look at the promise of future benefits.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA440146>

S 64

U.S. Army Research Institute: FY 2006 Program. (2006). (DTIC No. ADA470700).

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) conducts the Army's personnel, training, and leader development research and development (R&D) program. This program is part of the Department of Defense (DoD) Human Systems Technology Area. ARI is under the operational control of the Headquarters Department of the Army, Deputy Chief of Staff, G-1, but responds to broad Army requirements. We are the only Army behavioral and social science laboratory whose mission is personnel, training, and leader development research, technology development, and analysis. As such, ARI provides critical non-materiel solutions to improve Soldier, leader, and unit performance. To achieve organizational transformation, the Army is making major changes and more are planned over the next few years such as shifting from a division-based, heavy force to a brigade-based, modular force that is more powerful, flexible, and maneuverable; changing personnel procedures to stabilize units for longer periods of time; rapidly changing operational requirements to meet mission demands; and changing the process and procedures for training and education that will be more responsive to the pace of change and the availability of resources. The full success of these changes, in a volatile, high threat environment will require innovative personnel, training, and leader development knowledge products and technologies to improve human performance and to streamline the way the Army trains and educates the force. Currently, Soldiers and leaders are experiencing a very high operational tempo. The stress of fighting the global war on terrorism while simultaneously dealing with transformational changes in organizational structure and procedures, operational requirements, accelerating fielding of new systems and technologies, and a growing range and complexity of missions are challenging individual Soldiers, units, and their leaders. ARI's R&D program is providing the scientific basis to meet these challenges.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA470700>

S 65

U.S. Army Research Institute Program in Basic Research: FY 2005 & FY 2006. (2007). (DTIC No. ADA475117).

This document contains detailed summaries for each of the U.S. Army Research Institute's basic research contracts for the fiscal years 2005-2006. These summaries are grouped according to three Basic Research Office program objectives: Providing fundamental knowledge to improve training in complex environments; providing fundamental knowledge to improving leader and team performance; and providing fundamental knowledge for identifying and measuring the attributes and skills that are critical to Soldier recruiting, assignment, performance, and retention in the transforming Army. In addition to summarizing what was done or is being done, each summary also describes the contributions of that research effort to basic behavioral science and suggests how the findings might benefit the Army and other military services.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA475117>

S 66

U.S. Army Research Institute Program in Basic Research: FY 2007. (2008). (DTIC No. ADA483383).

This document contains detailed summaries for each of the U.S. Army Research Institute's basic research contracts for the fiscal year 2007. These summaries are grouped according to four Basic Research Unit program objectives: Providing fundamental knowledge to improve training in complex environments; providing fundamental knowledge to improving leader and team performance; providing fundamental knowledge for identifying and measuring the attributes and skills that are critical to Soldier recruiting, assignment, performance, and retention in the transforming Army; and providing fundamental knowledge for organizational behavior and network science research. In addition to summarizing what was done or is being done, each summary also describes the contributions of that research effort to basic behavioral science and suggests how the findings might benefit the Army and other military services.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA483383>

S 67 — Cancelled**S 68**

Training Small Unit Leaders and Teams. (2009). Evans, K.L., Knerr, B.W., & Gesselman, A.N. (DTIC No. ADA508029).

The Special Report summarizes a recently completed ARI research program in the area of small unit leader and team training. The program involved 27 separate lines of investigation organized into five broad research areas: new and emerging systems, desktop simulation, automated tools, simulation technology assessment, and high performance tasks. While highlighting the major findings from this body of research, the report also illustrates the various ways the research program has benefitted the Army, from providing timely information in support of project and system manager decision making to the development of new automated training tools and improved software for simulation training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA508029>

S 69

U.S. Army Research Institute Program in Basic Research: FY 2010. (2010). (DTIC No. ADA532364).

This document contains detailed summaries for each of the U.S. Army Research Institute's basic research contracts for the fiscal year 2010. These summaries are grouped according to four Basic Research Unit program objectives: providing fundamental knowledge to improve training in complex environments; providing fundamental knowledge to improving leader and team performance; providing fundamental knowledge for identifying and measuring the attributes and skills that are critical to Soldier recruiting, assignment, performance, and retention in the transforming Army; and providing fundamental knowledge for organizational behavior and network science research. In addition to summarizing what was done or is being done, each summary describes the contributions of that research effort to basic behavioral science and suggests how the findings might benefit the Army and other military services.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA532364>

S 70

Select for Success: A Toolset for Enhancing Soldier Accessioning. (2011). Heffner, T.S., Campbell, R.C., & Drasgow, F. (DTIC No. ADA554057).

The Army needs the best personnel available to meet the emerging demands of the 21st Century. Accordingly, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is conducting research to support implementing non-cognitive predictor measures (e.g. interests, values, temperament) to enhance entry-level Soldier selection and classification decisions. Based on this research, Army leadership has approved an operational test and evaluation (IOT&E) of the Tailored Adaptive Personality Assessment System (TAPAS) to supplement the Armed Services Vocational Aptitude Battery (ASVAB) in evaluating applicants for selection into the Army. This report provides background to the TOPS IOT&E and discusses how this initiative represents a significant improvement in the way the Army accesses new Soldiers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA554057>

S 71

Cross-Cultural Competence in the Department of Defense: An Annotated Bibliography. (2014). Gallus, J.A., Gouge, M.C., Antolic, E., Fosher, K., Jasparro, V., Coleman, S., Selmeski, B., Klafehn, J.L. (DTIC No. ADA599260).

Given the current operational context, research both inside and outside the DoD has increasingly focused its efforts on better understanding the factors that contribute to effective cross-cultural performance. Of particular interest is the role cross-cultural competence (3C) plays in Service members' ability to navigate cultural environments, as well as the specific knowledge, skills, and abilities that military training should be targeting to improve performance-related outcomes. Over the past ten years, numerous studies and theoretical pieces have been developed that explore these issues as they relate to both military and general populations. This annotated bibliography represents an initial attempt to gather this collection of work into a single, comprehensive review to be used as a reference for those conducting research in this domain. Annotations hail from a number of different disciplines, including military psychology, organizational psychology, anthropology, and sociology, and range in content from theoretical to empirical studies, efforts at model building and computer technologies for understanding, and various methods for teaching and assessing 3C.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA599260>

S 72

Army Sociocultural Performance Requirements. (2014). Wisecarver, M.M., Foldes, H., Adis, C., Gallus, J.A., & Klafehn, J.L. (DTIC No. ADA606000).

This report provides information regarding the cultural performance requirements for a sample of Soldiers who deployed or held a position outside of the continental U.S. within the past five years. Cultural performance requirements are actions Soldiers must take on their jobs to work effectively with people who hold different cultural values, beliefs, and norms in order to achieve the goals of their mission. Data were collected from a sample of 4,157 active duty Soldiers of varying ranks and Branches regarding the importance and frequency with which they engaged in 13 specific performance dimensions. Results found that for each of the dimensions, between one-fifth and one-half of the sample did not perform activities related to that dimension. For those who did perform activities in the dimension, however, they rated each of the dimensions as being moderate to very critical in successfully performing their mission. As a group, officers were more likely to engage in the cultural performance activities than were enlisted or warrant officers. Patterns also emerged based on whether a Soldier was in a combat or support Branch. Recommendations are presented for the training and education related to these sociocultural performance dimensions.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA606000>

S 73

Foundational Research in Behavioral and Social Sciences: Marching Towards the Future. (2014). Goodwin, G.F., & Keith, K.L. (DTIC No. ADA604807).

This document contains detailed summaries for each of the U.S. Army Research Institute's basic research contracts for the fiscal year 2012. These summaries are grouped according to six research portfolios: Personnel Testing and Performance, Learning in Formal and Informal Environments, Leader Development, Organizational Effectiveness, Socio-Cultural Capabilities, and Psychophysiology of Individual Differences. In addition to summarizing what was done or is being done, each summary

describes the contributions of that research effort to basic behavioral science and suggests how the findings might benefit the Army and other military services.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA604807>

Technical Reports

TR 1098

Defining Dimensions of Performance for Special Forces Soldiers. (1999). Zazanis, M.M., Carpenter, T.D., & Kilcullen, R.N. (DTIC No. ADB250535 / Restricted).

TR 1099

Identifying Conceptual Skills of Future Battle Commanders. (2000). Noble, S.A., & Fallesen, J.J. (DTIC No. ADA374875).

This research was conducted to support the U.S. Army Research Institute-Fort Leavenworth Research Unit's ongoing DEVCOM program (Developing Commanders for the Future Battlefield). Specifically, this research was designed to supplement previous work done in the development of battle commanders' conceptual thinking (Fallesen, in preparation). The overall goal of this research was to identify, organize, and clarify examples of the conceptual skills that are important to the development of future battle commanders. Three data collections helped to develop a conceptual skills model called the S (3) (Situation Understanding, Simulation, Self-regulation). The S (3) Model helped to filter previous lists by separating task specific Conceptual Skills (what to think) from those conceptual skills centered on general aspects of thinking (how to think). Of all the data collected, the most useful information was found by considering the inconsistencies between importance ratings and personal, historical examples. Inconsistencies were found where officers would rate non-traditional conceptual skills low on importance, yet they would provide an example of where possessing such a skill was essential. In general, officers were unfamiliar with conceptual skills that are directly represented in tactical decision-making procedures or the estimate of the situation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA374875>

TR 1100

An Annotated Bibliography of Recruiting Research Conducted by the U.S. Army Research Institute for the Behavioral and Social Sciences. (2000). Penney, L.M., Horgen, K.E., & Borman, W.C. (DTIC No. ADA376109).

This is an annotated bibliography of research by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) on Army recruiting. Most of the research covered in this report was conducted during the period 1980 and 1999. To provide a framework for this work the research summaries are organized around a model of Army recruitment showing the important factors contributing to successful recruiting. In the model, recruiter production is conceptualized as a joint function of recruiter performance and youths' propensity to enlist. Propensity to enlist is linked to advertising effects and several other environmental factors. Recruiters' performance, in turn, is influenced by their personal characteristics, the training and mentoring they receive, and the level of technical and organizational Support provided to them. The ARI research relating to each of these major components in the recruitment model is documented in this report.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA376109>

TR 1101

Leadership for Change. (2000). Harries-Jenkins, G. (DTIC No. ADA385569).

Western military establishments in a period of detente encounter a number of uncertainties in their quest for the most appropriate leadership styles and strategies. The pace and scale of change in modern day armed forces is such that traditional situational leadership associated with well-established means and objectives may no longer be sufficient. At a time when the nature of primary goals, long-term norms and societal preferences makes it difficult to identify and prioritize individual organizational strategies it is useful to review the overall experience of national military establishments. Such a review is most effectively carried out through a comparative approach which through it may not produce prescriptive solutions, provides a greater understanding of the challenges to be faced.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA385569>

TR 1102

21st Century Soldiers and Noncommissioned Officers: Critical Predictors of Performance. (2000). Ford, L.A., Campbell, R.C., Campbell, J.P., Knapp, D.J., & Walker, C.B. (DTIC No. ADA380044).

The goal of the Soldier21 and NCO21 projects was to conduct a comprehensive analysis of future conditions and future job demands in order to identify critical performance predictors or knowledges, skills, and abilities (KSAs) that may eventually be developed into selection (Soldier21) and promotion (NCO21) criteria. Three eras were examined: the Army of Excellence (1990-2000), Army XXI (2000-2010), and the Army After 2010 (2010-2025). The specific objectives for Soldier21 were to (a) identify and describe the nature and type of changes that are expected to occur in these eras, (b) forecast future job requirements and the critical individual characteristics of Soldiers who will perform proficiently, and (c) identify selection measures that might be used to assess individual characteristics. For NCO21, the objectives were to (a) provide a description of forecasted conditions affecting future NCO performance, (b) describe the future job requirements, and (c) provide a descriptive list of the main qualities needed for effective noncommissioned officer performance. This report documents the methodology and findings of this effort.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA380044>

TR 1103

Training Dismounted Soldiers in Virtual Environments: Enhancing Configuration Learning. (2000). Witmer, B.G., Sadowski, W.J., & Finkelstein, N.M. (DTIC No. ADA381715).

For nearly a decade the U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) has conducted research in using virtual environments (VE) to train dismounted Soldiers. While showing that some dismounted Soldiers skills can be trained in VE, the research has also identified problems in using VE for Soldier training. Spatial performance deficiencies caused by disorientation and perceptual distortion have been found. This paper describes research investigating the effectiveness of various VE navigation aids in overcoming inherent VE deficiencies, thereby enhancing VE spatial learning. Sixty-four participants received a guided tour of the third floor of a virtual building, freely explored the environment visiting six named destinations along the way, and then practiced finding each destination in turn. After training, participants were asked to estimate the distance and direction to destinations not in their line of sight, to locate each destination by traveling to it after having been teleported to another destination, and to place room cut-outs on a map outline of the third floor. The only navigation aid that improved performance on these tasks was providing an aerial view of the VE. The effectiveness of the aerial view depended on how the participants used it.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA381715>

TR 1104

Platoon Readiness as a Function of Leadership, Platoon, and Company Cultures. (2000). Bass, B.M., & Avolio, B.J. (DTIC No. ADA382244).

The ultimate criterion of Army light infantry unit readiness is its performance in combat. A second criterion is the unit's readiness in peacekeeping missions. A close representation of requirements for peacekeeping is reflected in the unit's effectiveness in home station. A modified military version of the Multifactor leadership Questionnaire (MLQ) was used to profile the individual leadership style of platoon leaders (PLs) and platoon sergeants (PSGs). The Team Multifactor Leadership Questionnaire (TMLQ) was used to describe the platoon and company culture. Results for the MLQ were in line with expectations derived from Bass and Avolio's full range model of leadership. If leaders, particularly PLs, were transformational according to their superiors, peers, and subordinates, their platoons were seen by raters in home station as more effective both in home station and in simulated combat arenas. The most accurate predictions were made by the company cadres; the least accurate were made by the platoon members.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA382244>

TR 1105

Tacit Knowledge for Military Leadership: Seeking Insight into the Acquisition and Use of Practical Knowledge. (2000). Hedlund, J., Sternberg, R.J., and Psotka, J. (DTIC No. ADA383927).

The goal of the project was to provide preliminary insight into the process of tacit knowledge acquisition and to support the development of tools to assess the use of various knowledge-acquisition processes in solving practical leadership problems. These requirements were met by (a) reviewing relevant theory and research on tacit knowledge, leadership, and knowledge acquisition; (b) reporting results of

analyses performed on free text responses provided by Army officers to tacit- knowledge scenarios; and (c) discussing the implications of this research for ongoing efforts to identify and assess the processes associated with tacit-knowledge acquisition. Over the course of the multi-year project evidence was discovered that tacit knowledge from the stories and advice leaders shared about their experiences could be used to developed tools for measuring the possession of tacit knowledge and evidence was obtained that tacit knowledge relates to effective leadership. Relationships were found between rank and tacit-knowledge scores on the company and battalion inventories, providing support for the relationship between experience and tacit knowledge.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA383927>

TR 1106

Predicting Rifle and Pistol Marksmanship Performance with the Laser Marksmanship Training System. (2000). Smith, M.D., & Hagman, J.D. (DTIC No. ADA384045).

To develop an LMTS-based tool for predicting small arms, live-fire marksmanship qualification performance, Idaho Reserve Component (RC) Soldiers fired for qualification on LMTS and on the live-fire range with either the M16A2 rifle (N =95) or M9 pistol (N =81). A statistically significant relation between LMTS and live-fire qualification scores was found and validated for both rifle ($r = .55$) and pistol ($r = .47$) and then used to develop weapon-specific tools for RC trainers to use in predicting the probability of individual Soldier, first-run, live-fire, rifle and pistol qualification based on scores fired on LMTS. Use of these prediction tools will enable RC marksmanship trainers to schedule LMTS-based training more efficiently by targeting only those Soldiers in need of remediation (i.e., those predicted to be unlikely live-fire qualifiers), as well as to identify when enough training has been provided (i.e., when the predicted likelihood of live-fire qualification is good). These tools also provide the RC unit commander with a set of LMTS-based, empirically derived live-fire performance standards to support (a) implementation of a competency-based rifle, as well as pistol, sustainment training program of instruction using LMTS, and (b) use of LMTS-based qualification firing in place of live-fire qualification firing when outdoor range facilities are not readily available.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA384045>

TR 1107

Applying Collaborative and E-Learning Tools to Military Distance Learning: A Research Framework. (2000). Bonk, C.J., & Wisher, R.A. (DTIC No. ADA389681).

This report is a resource guide for those concerned with using collaborative and e-learning environments; those that use the Internet in a military training setting. The report is intended for training developers and planners, instructional designers, and program evaluators. The report offers a broad examination of findings from the educational literature, where the preponderance of research on e-learning tools and collaborative learning (i.e., groups of learners who have a common goal) has been conducted. Reviewed first are the emergence of e-learning tools and constructivism, the role of the instructor in such approaches, and the increasing importance of learner-centered approaches to instruction. Appropriate quantitative and qualitative research methodologies are then described. A summary of relevant findings on collaborative tools, individual differences, and learning communities is also provided. Suggestions are made for experiments that test the adaptability to military training environments of e-learning and collaborative learning methods emanating from education. Ten primary and 17 secondary experiments are devised that derive from current psychological principles in cognition, motivation, social factors, and individual differences as applied to Internet-enabled learning.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA389681>

TR 1108

Specifications for an Operational Two-Tiered Classification System for the Army. Volume 1: Report. (2000). Zeidner, J., Johnson, C., Vladimirovsky, Y., & Weldon, S. (DTIC No. ADA385535).

The broad objective of the present study is to design an improved two-tiered classification system and to compare its classification efficiency to the current operational aptitude area (AA) system. The total data set includes about 260,000 recruits serving in 170 different entry-level MOS during 1987-1989. The set includes all available ASVAB/Skill Qualification Test (SQT) data for MOS with adequate sample sizes collected by ARI during this time frame. The proposed system to be evaluated in this study would use an invisible or black-box first tier in which separate assignment variables (AVs) are computed for up to 150 job families. The first tier AVs are to be used in assigning recruits to entry-level MOS. The second tier is used in recruiting, counseling and administration. The proposed system to be evaluated in the visible second tier uses up to 17 families. It is proposed that the aptitude area scores of the visible system be

recorded on each Soldier's personnel record. The principal finding of the present study is that the unbiased overall mean predicted performance (MPP) of the 150 job family structure is .195 compared to the MPP for the existing operational system of .023, a gain of more than eight fold. The unbiased overall MPP for the 17 job families is .146. The 17 family system is obtained by shredding the existing AA families within the boundaries of the operational classification families to maximize the Horst index. Findings continue to support an early differential assignment theory (DAT) principle that maximum MPP is obtainable by using AVs for all jobs having adequate or stable validity data. The results clearly demonstrate that considerable classification efficiency is potentially obtainable from the existing ASVAB if it is used in accordance with DAT principles.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA385535>

TR 1109

An Annotated Bibliography of Recruiting Research Conducted in the U.S. Armed Services and in Foreign Services. (2001). Penney, L.M., Sutton, M.J., & Borman, W.C. (DTIC No. ADA389679).

This is an annotated bibliography of research conducted on military recruiting by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), the other U.S. military services, and foreign military organizations. To provide a framework for the research summaries, they are organized around a model of military recruitment showing the important factors contributing to successful recruiting. The model contains the following factors: (1) personnel selection and assessment; (2) training and development; (3) recruiting management and organization; (4) recruiter performance; (3) marketing; (6) youth supply, characteristics, and influencers; (7) propensity; (8) enlistment decisions; and (9) delayed entry programs. One hundred fifty-one reports are summarized, describing recruiting research most relevant to the current U.S. military recruiting environment. It is hoped that the review provides a comprehensive yet concise picture of the research results generated by the U.S. Army, Navy, Marine Corps, Air Force, and Foreign Service recruiting research communities.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA389679>

TR 1110

Instructional Strategies for Training Teams in Virtual Environments. (2001). Lampton, D.R., McDonald, D.P., Rodriguez, M.E., Morris, C.S., Parsons, J., & Martin, G.A. (DTIC No. ADA389674).

This report describes the design and implementation of the Fully Immersive Team Training (FITT) research system, and the first experiment conducted with that system. FITT was developed to support research on the use of distributed Virtual Environments (VEs) for training dismounted infantry. The hardware and software functional requirements included: locomotion, object manipulation and aiming, communication among participants, design of avatars for participants and computer generated forces, data capture and playback, as well as a host of networking issues. The first experiment examined instructional strategies involving how and when to give guidance during team training with VEs. Ninety-four college students participated in the experiment. Two person teams engaged in search missions in VEs depicting building interiors. Teams were given guidance either before (demonstration), during (coaching), or after (replay) the first practice mission, or not given any guidance at all (control group). Performance measures included: speed and accuracy of search, communications, and security procedures. Results indicated that the FITT interface worked well in enabling the participants to move in and interact with the VEs, and to act as a team. The feasibility of implementing and administering each of the instructional strategies in a VE training context was demonstrated.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA389674>

TR 1111

Leadership Development: A Review of Industry Best Practices. (2001). Day, D.V., & Halpin, S.M. (DTIC No. ADA391440).

A review of leadership development best practices in for-profit organizations was conducted. Practices discussed in this report include formal development programs, 360-degree feedback, executive coaching, job assignments, mentoring, networks, reflection, action learning and outdoor challenges. Additionally, five organizations that are popularly recognized for their leadership development practices are highlighted in this report. Highlights include information regarding the organizational philosophy, values, and mission as well as information on how various leadership development practices are implemented and integrated. Best practice principles are drawn from this research and implications for their use within the U.S. Army are discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA391440>

TR 1112

Effect of Viewing Conditions on Sickness and Distance Estimation in a Virtual Environment. (2000). Ehrlich, J.A. (DTIC No. ADA390448).

Previous research indicates that Helmet Mounted Displays (HMDs) using stereoscopic presentation techniques induce greater Simulator Sickness symptomology than a biocular presentation. However, neither of these presentation methods takes into account the different perspective each eye normally receives as a result of each eye turning to fixate on objects in different depth planes, referred to as vergence movements. The present study examined the effects of a vergence algorithm moderating the stereoscopic display in an HMD in a within subjects comparison to standard stereoscopic and biocular presentations. The experiment used a distance estimation task and the other major variable was incidence of simulator sickness. The experiment task required moving through rooms in a virtual environment and providing distance estimates to different objects. The findings suggest that most participants would recover more easily from simulator sickness symptoms with a vergence viewing condition. However, because this study shows a wide range of individual differences, a vergence adjustment to stereoscopic presentation should not be expected to eliminate the number of participants withdrawing, but only to reduce their number when repeated exposures are involved. Also, the range of individual differences indicates a need for multiple measures of symptomology not only to help identify individuals who are under duress, but to better assess when they have adapted. One candidate measure of duress is dark vergence, based on its objective scaling, its relevance to adaptation, and its correlation with 55 sub-scale scores.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA390448>

TR 1113

Cognitive Behaviors for Computer Generated Forces. (2000). Gillis, P.D., Sweetman, B., Ehrlich, J.A., Hursh, S., & Guest, M.A. (DTIC No. ADA390351).

The basic problem addressed by this research concerns the need for more intelligent and realistic behavior by Computer Generated Forces (CGF) Command Entities (CEs) in Advanced Distributed Simulation (ADS) through the utilization of better human performance and cognitive modeling (HPCM) R&D. Realistic cognitive modeling class specifications for CGF have yet to be developed, especially for large scale simulations; hence this is a needed research and development area. The lack of existing research impacts the accurate behavior of CGF CEs, and it also affects the human resources required for CGF scenario development and exercise control in ADS. They are inappropriately demanding and may be off-loaded by more intelligent and realistic CGF behaviors. In addition, the development of human performance cognitive models (HPCM) for CGF entities and consequent CE behaviors needs to be validated in a realistic simulation setting. To meet this need, the U.S. Army Research Institute for the Behavioral and Social Sciences has developed and used a constructive simulation testbed, the Command, Control, and Communications Simulation (C3SIM), and has also used National Training Center data as a means to validate HPCM-driven CE behavior.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA390351>

TR 1114

Enhancing the Efficiency of Tank Gunnery Evaluation: A Strategy Revisited. (2001). Hagman, J.D. (DTIC No. ADA391096).

Based on the analysis of gunnery scores fired by 171 M1A2 tank crews, an easy-to-use strategy was developed for predicting which crews will, and will not, first-run qualify on Tank Table VIII before all of the typically required ten engagements have been fired. Scores are added as each engagement is fired and the resulting sum is compared to tabular formatted cutoff scores established to support accurate qualification predictions. Adherence to this strategy will help Active Army armor unit commanders to maximize the efficiency of tank gunnery evaluation by reducing the number of first-run engagements fired, as well as the range time and operational tempo (OPTEMPO) resources spent in doing so, by roughly 20% without sacrificing the purpose and intent of the crew-level gunnery certification process.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA391096>

TR 1115

Applying Digital Technologies to Evaluation: A Focus on Command and Control. (2001). Lickteig, C.W., & Quinkert, K.A. (DTIC No. ADA392994).

The Army's growing reliance on digital technologies reinforces and extends concerns about training and evaluation, particularly in the area of command and control. Digital technology represents a new and

powerful weapon for attacking evaluation requirements, but is a double-edged sword that poses challenge and opportunity. This report examines how digital technologies can help solve many evaluation challenges, including the ones they create. The Background chapter reviews basic issues confronting conventional command and control performance and evaluation. Two key issues considered are manually burdened methods and measures, and the limitations imposed by analog media. The Findings chapter examines how digital technologies might improve evaluations of command and control performance. This examination begins by identifying many of the new challenges introduced by digital command and control systems. Next, opportunities for overcoming evaluation challenges through the application of digital technologies are considered, including automated measures of versus about performance, more precise and comprehensive measures, and less burdened measurement methods. Finally, examples of digital measurement methods illustrate the potential for improving command and control evaluation through digital data integration, data mining, and data visualization. The report's conclusions identify some key research and development efforts required for applying digital technology to improve command and control performance and evaluation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA392994>

TR 1116

Assessing and Measuring Training Performance: 2000 Workshop. (2001). Hiller, J.H., & Wampler, R.L. (DTIC No. ADA395940).

This report provides documentation of the papers and briefings presented to workshop participants. The goals of the workshop were to provide key Army leaders with: 1). A review of current state-of-the-art methods for training performance measurement 2. Identification and clarification of measurement and assessment issues 3. Recommended solutions and identification of essential research and development. Eighty-five individuals from government agencies (both military and civilian), academia, and contractors attended the workshop held in Newport News, VA.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA395940>

TR 1117

Defining Digital Proficiency Measurement Targets for U.S. Army Units. (2001). Barnett, J.S., Meliza, L.L., & McCluskey, M.R. (DTIC No. ADA396899).

The U.S. Army is exploring the advantages of networked computer systems to enhance battlefield situation awareness and command and control, a program known as digitization. The long-term goal of the present effort is to develop measures of the skills needed to exploit the advantages of digitization. The initial challenge was to identify candidate digital skills, since there was no listing of digital skills available to use as a starting point. This report focuses on the approach used to identify candidate digital skills. First, data from the Center for Army Lessons Learned (CALL) were analyzed to identify long-term, high-profile problems likely to be addressed by the effective use of digital systems. Next, digital procedures that units might employ to address these problems, and the cognitive capabilities Soldiers would need to implement these solutions, were described. Through this process, twenty-two candidate skills were identified which could be used to identify measures of skill performance. The findings of this report will be used to help define performance standards and develop after action review aids.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA396899>

TR 1118

Team Performance in Distributed Virtual Environments. (2001). Singer, M.J., Grant, S.C., Commarford, P.M., Kring, J.P., & Zavod, M. (DTIC No. ADA396489).

The U.S. Army is using virtual simulations for mission planning, training, rehearsal, and concept development virtual environment (VE) technology can provide simulated real world activities for dismounted Soldiers. One issue in the use of distributed simulations is whether team members learn, perform, and transfer their skills in distributed situations in the same ways as individuals in local situations. In this experiment, local and distributed teams completed a series of mission rehearsals in a VE over two days. Eighteen, two-person teams of college students performed synthetic tasks representative of tasks performed by police, emergency response, and military teams. All participants were trained to criterion in a VE before being assigned to a team. Biographical information and subjective self-report questionnaires were administered before, during, and after training and mission sessions. Local teams interacted face-to-face between mission rehearsal sessions, while distributed teams only interacted by phone during the after action review session following each mission. Local teams performed significantly better than distributed teams on several collective task measures over the

repeated missions. Simulator sickness and presence during the mission rehearsals were also investigated.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA396489>

TR 1119 — Replaced by RN 2001-04

TR 1120 — Replaced by RN 2001-03

TR 1121

Question Generation as a Learning Multiplier in Distributed Learning Environments. (2001).

Graesser, A.C., & Wisher, R.A. (DTIC No. ADA399456).

This report provides a rationale for question generation as a workable learning multiplier in distributed learning environments. The rationale was derived from a thorough review of recent research on questioning from multiple perspectives: psychology, cognitive science, computational linguistics, and information systems design. Based on this review, nine practices were identified for immediate use in both the conventional classroom and distributed learning settings. If employed properly, question generation strategies in distributed learning can increase a Soldier's depth of understanding about the workings of a complex system. The strategy is particularly useful for asynchronous distance learning, where the instructor is not necessarily available to answer questions promptly.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA399456>

TR 1122

Evaluating an Approach to Military Operations in Urban Terrain Decision Skills Training. (2001).

Pliske, R.M., Militello, L.G., Phillips, J., & Battaglia, D.A. (DTIC No. ADA399392).

An experimental training program was developed to improve the battlefield decision skills of platoon leaders during Military Operations in Urban Terrain (MOUT). The program was implemented in the form of a multimedia, train-the-trainer CD-ROM titled "IMproving Performance through Applied Cognitive Training" (IMPACT). This report describes an evaluation of the usability of IMPACT, including an exploration of methodological issues associated with evaluating the effectiveness of training programs to improve decision-making skills. The evaluation was conducted at the U.S. Military Academy with cadets and U.S. Army captains participating as students and instructors, respectively. Participants were randomly assigned to either IMPACT or traditional after-action review (AAR) conditions. Instructors conducted two training sessions with cadets using either IMPACT or traditional AAR methods. Cadets then participated in a final session where they were tested on their MOUT decision-making skill and knowledge. Although we found few statistically significant differences between cadets in the two conditions, instructors reported IMPACT to be a valuable and highly usable training tool. Furthermore, we were able to develop an objective test to measure decision quality, as well as a process that resulted in reliable ratings of decision quality from subject matter experts.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA399392>

TR 1123

Analysis of Infantry Situation Awareness Training Requirements. (2001). Strater, L.D., Jones, D., &

Endsley, M.R. (DTIC No. ADA399391).

The application of emerging digital technologies promises to revolutionize information acquisition and distribution on the battlefield of the near future. With more rapid information flow, even minimally experienced officers will be pushed to achieve faster decision-action cycles, reducing the time to make and implement decisions. With this advent, officers will increasingly require robust abilities to rapidly develop and maintain high levels of situation awareness (SA) in the harsh, dynamic, and confusing environment of Infantry combat. To date, no training programs have been developed specifically for the purpose of enhancing SA in Infantry forces. This study focused on identifying areas of low and high SA, especially those areas where training can be employed to reduce deficits in SA among less experienced officers. A literature review was conducted to explore research into SA, with an emphasis on the Infantry domain. In addition, data from a prior study were examined to explore the relationships between SA and decision-making. Finally, trainers were surveyed to solicit their input on specific strengths and weaknesses in the SA of new platoon leaders. Results of the investigation include recommendations for training programs to improve SA in Infantry forces.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA399391>

TR 1124

Intelligent Tutoring System for Teaching Battlefield Command Reasoning Skills: Phase1. (2002). Domeshek, E.A. (DTIC No. ADA400494).

Report developed under a Small Business Innovation Research Program 2000.2 contract for topic OSD00-CR02. The research reported here aimed at the design of a Socratic Intelligent Tutoring System (ITS) for high-level battlefield command reasoning skills. The ultimate goal of this research is to develop new ITS techniques and technology for teaching skills that cannot be taught as simple methods and procedures to be followed. Achieving expert levels of proficiency in high-level command reasoning skills—whether for battlefield commanders or for executives in industry—requires extensive practice, coaching, and feedback. Learners must be given a chance to drill on detailed and situation-specific knowledge, as well as high-level thinking habits and skills applicable across diverse situations. We studied exemplary command reasoning mentoring by observing tutoring sessions centered on Tactical Decision Games (TDGs). We analyzed those sessions to produce a first draft general model of tutoring actions. We also built a limited proof-of-concept prototype that exhibited many of the key behaviors identified. Taken together, the conduct and products of our Phase I work, along with our proven strong team of collaborators, position us well to carry through on the ambitious work plan outlined here for Phase II.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400494>

TR 1125

Automated Tutoring Environment for Command: Using an Intelligent Tutor to Model Expert Mentor Interactions. (2002). Ryder, J.M., DePaul, J.L., Zachary, W.W., & Iordanov, V. (DTIC No. ADA400648).

This report developed under a Small Business Innovation Research Program 2000.2 contract for topic OSD00-CR02. The report discusses the feasibility of developing an intelligent tutoring system (ITS) for the interactive training of thinking skills, such as battlefield command reasoning. This ITS will operate within the deliberate practice framework. An "Automated Tutoring Environment for Command" (ATEC) system was designed and a limited prototype was developed to automate the Think Like a Commander (TLAC) materials. The ATEC system is comprised of: (a) a dialog management capability from the AutoTutor system, (b) an instructional agent that replicates the knowledge and role of the human TLAC tutor, and (c) a web-based personalized interface that manages the interaction between instructional agent and trainee. The Phase I research effort reported here has defined the architecture for ATEC. This effort has also demonstrated a proof-of-concept prototype, and has provided a detailed design for a full-scale Phase II system development by 2003.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400648>

TR 1126

Analog Scales as Temperament Measures in the Baseline Officer Longitudinal Data Set. (2002). Milan, L.M. (DTIC No. ADA400570).

The Baseline Officer Longitudinal Data Set (BOLDS) was developed jointly by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) and the U.S. Military Academy (USMA) to enable researchers to study the development of leader performance over time. Currently, BOLDS consists of data accumulated on USMA cadets from the Class of 1998. Because no personality inventories were administered to cadets, analog scales were developed to represent the scales of the Assessment of Background and Life Experiences (ABLE) and the NEO Personality Inventory (NEO-PI). This report examines these empirically derived analog scales to ensure they measure within BOLDS what they were intended to measure. Two replication exercises were performed: (1) rerunning analyses Evans (1997) ran when creating the analog scales and (2) comparing results produced using the analog scales with those that emerged from actual ABLE scales. Results indicate the analogs perform in a manner consistent with previous analyses, suggesting they suffice as veridical temperament measures and may be used as such in future BOLDS analyses.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400570>

TR 1127

Measures Collected on the USMA Class of 1998 as Part of the Baseline Officer Longitudinal Data Set. (2002). Milan, L.M., Bourne, D.R., Zazanis, M.M., & Bartone, P.T. (DTIC No. ADA400567).

The Baseline Officer Longitudinal Data Set (BOLDS) was developed jointly by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) and the US Military Academy (USMA) to enable researchers to study the development of leader performance over time. Currently, BOLDS consists of

data accumulated on USMA cadets from the Class of 1998. The measures in the database represent ten broad dimensions relevant to leader development: cognitive aptitude, complex problem-solving skills, tacit knowledge of military leadership, temperament, motivation, leadership style, leadership performance, physical fitness, cognitive-emotional identity development, and developmental experiences. This report identifies all of the measures included in BOLDs and describes their psychometric properties. Such documentation is essential to facilitate utilization of the database and to inform future data collections, which are scheduled to track this officer cohort throughout their military careers and to expand BOLDs to officers from other commissioning sources.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400567>

TR 1128

Development of Predictor and Criterion Measures for the NCO²¹ Research Program. (2002). Knapp, D.J., Burnfield, J.L., Sager, C.E., Waugh, G.W., Campbell, J.P., Reeve, C.L., Campbell, R.C., White, L.A., & Heffner, T.S. (DTIC No. ADA405458).

The NCO²¹ research program was undertaken to help the U.S. Army plan for the impact of future demands on the noncommissioned officer (NCO) corps. The performance requirements and associated knowledge, skills, and aptitudes (KSAs) expected of future successful NCOs were used as a basis for developing tools that could be incorporated into an NCO performance management system geared to 21st-century job demands. This report documents the design and development of predictor and criterion measures that will be used in a criterion-related validation data collection. The predictor measures include the Armed Services Vocational Aptitude Battery (ASVAB), Assessment of Individual Motivation (AIM), and Biographical Information Questionnaire (BIQ), which are operational tests already used in the Army for other purposes. A written Situational Judgement Test (SJT), the Experience and Activities Record (ExAct), Personnel File Form (PFF21), and a semi-structured interview were developed for this project. Two types of rating scale instruments were developed for gathering criterion data. The Observed Performance Rating Scales ask supervisors to rate Soldiers on how well they perform in their current jobs. The Expected Future Performance Rating Scales ask supervisors to predict how their Soldiers would perform in specific sets of conditions expected to be characteristic of future Army requirements.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA405458>

TR 1129

Virtual Environments for Dismounted Soldier Simulation, Training, and Mission Rehearsal: Results of the FY 2001 Culminating Event. (2002). Knerr, B.W., Lampton, D.R., Crowell, H.P., Thomas, M., Comer, B.D., Grosse, J.R., Centric, J.H., Garfield, K.A., Martin, G.A., & Washburn, D.A. (DTIC No. ADA403147).

This report describes the activities and results of the third year culminating event (CE) of the "Virtual Environments for Dismounted Soldier Simulation, Training and Mission Rehearsal" Science and Technology Objective (STO). This STO is being conducted jointly by the U.S. Army Research Institute, the U.S. Army Simulation, Training, and Instrumentation Command (STRICOM), and the U.S. Army Research Laboratory. This four-year effort (FY99-FY02) is focused on overcoming critical technological challenges that currently prevent high fidelity dismounted Soldier simulation. The objectives of the CE were to integrate and evaluate the technologies developed during the year. The key technologies included: a Dismounted Infantry Virtual After Action Review (AAR) System; new behaviors and improved operator control for Dismounted Infantry Semi-Automated Forces (DISAF); Soldier control of DISAF through Voice Recognition and Synthesis; enhancements to the Soldier simulator, the Soldier Visualization Station (SVS); an improved locomotion device, the Omni-Directional Treadmill (ODT); a dynamic terrain server; and a Mission Planning and Training Tool (MPTT). The CE provided a realistic and challenging test of the systems and capabilities under development. The results identified both accomplishments and areas in which improvements and corrections are required.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA403147>

TR 1130

Assessing Decision Making Skills in Virtual Environments. (2002). Gately, M.T., Watts, S.M., & Pleban, R.J. (DTIC No. ADA405079).

Members of small dismounted units will face growing responsibilities and increasing challenges in combined arms combat and contingency operations on the battlefield of the future. Many of these missions will take place in urban settings. Training for military operations on urbanized terrain is limited by time, cost, and safety factors. Virtual environment technologies have the potential to provide the

Army with a training capability to meet these new demands. An automated training and after action review support tool (Virtual Soldier Skills Assessor – ViSSA) is described. The ViSSA system will allow trainers to effectively assess Soldier and small unit leader tactical and decision-making skills in virtual urban environments. The system tracks mission-related factors linked to Soldier decisions, movements, fire, radio, traffic, and contact with virtual entities and trigger lines under an intricate web of overlays designed to capture and store these specific pieces of data during a training scenario. The system provides automated output displays for an effective after-action review following the virtual exercise. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA405079>

TR 1131

Radio Communications and Situation Awareness of Infantry Squads During Urban Operations. (2002). Christ, R.E., & Evans, K.L. (DTIC No. ADA405850).

This research evaluated the frequency and content of squad radio communications, and reevaluated situation awareness (SA) data collected by others. Both sets of data were collected using 14 Ranger squads executing urban operations driven by scripted vignettes. The radio communications data highlighted factors that influence and determine the consequences of squad radio communications. These data were differentially sensitive to communications about friendly and threat conditions as well as mission and visibility conditions. Important moderating factors for these results were differences found for downward- and upward-directed communications and conflicting requirements for processing information under conditions of information overload. The reanalysis of the SA data yielded separate measures of SA for squad leaders and their subordinates, and for top-down and bottom-up sources of knowledge about battlefield conditions. The fine-grain reanalysis of SA data showed effects not previously reported and clarified some that were. The data emphasize the need to consider echelon differences in estimating the criticality of battlefield information, as well as the impact on SA of visibility and information overload conditions. Taken together, the results underscore the fact that reliable explanations of the relationship between squad radio usage and squad SA rely on detailed analyses of both factors.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA405850>

TR 1132

Improving Soldier Factors in Prediction Models. (2002). Archer, R., Walters, B., Oster, A., & Van Voast, A. (DTIC No. ADA408867).

This report was developed under SBIR contract for topic A98-163. A key decision made at the highest levels of any military is the trade-off between allocating resources to system acquisition versus allocating resources to maintain force readiness through training. Advanced Distributed Simulations (ADS) provide a mechanism for tactical combat training through man-in-the-loop simulators and Computer Generated Forces (CGF). The potential for using ADS to address the trade-offs for allocating resources is dampened by the unrealistic behavior of CGF. Phase I of this project produced algorithms, data structures, and a methodology for incorporating the effects of training and environmental stressors to improve CGF behavioral realism. In Phase II, we expanded and enhanced the technical feasibility for including these effects in CGF entities on simulated battlefields. The resulting product is called the Training Effects and STressor Integration Module (TESTIM). It can provide the Army with the ability to improve the realism of CGF entities in ADS and other human performance models. TESTIM can also be used to assess the expected payoff of training in terms of improved performance.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA408867>

TR 1133

Web-Based Collaborative Learning: An Assessment of a Question Generation Approach. (2003). Belanich, J., Wisher, R.A., & Orvis, K.L. (DTIC No. ADA410956).

Students linked into a learning environment over the Internet may learn topics better by collaborating to create questions and answers. In research reported here, students used a learning aid for collaborative question generation called Army TEAMThink, a commercial program modified for Army use under a TRADOC Delivery Order contract. Research was done at three U.S. Army schools to assess the quality or doctrinal correctness of questions and answers generated by students and to measure any learning benefit. Students first completed a tutorial on how to write effective multiple-choice questions. Next, students wrote questions and reviewed questions written by other students. Based on the feedback from the reviews, authors were allowed to modify their own questions. Finally, students took a test of the questions that had been developed by students using the learning aid. Army subject matter experts judged that most of the questions developed were considered acceptable and could be repurposed for

use in course exams. A majority of the question feedback was constructive, indicating that the collaborative process was helpful. Students who went through the process scored higher on a test of novel questions than those who did not use Army TEAMThink. They also scored higher than students who went through the process on a different topic from the test topic, demonstrating a moderate learning effect. The general finding of this research about a collaborative question-generation approach is that instructors can accumulate quality multiple-choice questions and monitor student comprehension, and students have an additional opportunity for better learning.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA410956>

TR 1134

Cooperative Interface Agents for Networked Command, Control, and Communications: Phase 1. (2003). Wood, S.D. (DTIC No. ADA414232).

This report was developed under a Small Business Innovation Research Program 2000.2 contract for topic A02-024. The research reported here explored methods for effectively controlling FCS units containing mixed human and robotic elements. The objective was to determine whether an agent framework built around three specified agent types (Tasking, Coordinating, and Monitoring) could be constructed to add an intelligent abstraction layer between human commanders and battlefield elements. The focus was to identify human-system interaction issues, design potential solutions, and create software that supports the commander's tasks and mitigates inherent human performance limitations. A prototype interface agent architecture was designed, and a framework was implemented. Interface agents were created to perform in a simple, simulated battle scenario. The work conducted during Phase I lays the foundation for a Phase II plan to create more realistic scenarios and test the utility of interface agents in a variety of experimental settings.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA414232>

TR 1135

Utility of Game Instructions. (2003). Chen, J.Y. (DTIC No. ADA414105).

Due to the increasing usage of computer games for military training purposes, it is more important than ever to understand how computer games can be utilized in an effective and efficient manner. One important issue facing the military training community is that training time is at a premium and trainees need to be able to play the game within as short a time as possible so they can start using the game to train the skills of interest. This report describes an experiment that examined various game-related performance measures and concluded that the two different instructional techniques (i.e., computer-based tutorials and game tips) appeared to be effective in different ways, and players with access to both learned the game most effectively. To be more specific, computer-based tutorials appeared to be more beneficial for motor elements such as maneuvering and actions. On the other hand, those who had access to game tips performed better in cognitive segments of the game such as setting up game plans and familiarity with the game interface. These results can be incorporated in military training programs where computer games are part of the curriculum. Future military game development can also utilize these results to determine which type of instructional material to be included in the games.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA414105>

TR 1136

Distant Leadership Under Stress. (2003). Xiao, Y., Seagull, F.J., Mackenzie, C.F., Klein, K.J., Ziegert, J., & Scalea, T. (DTIC No. ADA417104).

This project was initiated to develop a phenomenology of team leadership and distant leadership in a highly dynamic, potentially extremely stressful domain: trauma patient resuscitation. A series of five studies were conducted to understand team leadership in trauma teams. One of the studies was a field experiment in which the location of the team leader was assigned to a distant location connected to the rest of the team through telecommunication linkages. The studies used a variety of qualitative and quantitative methods. In contrast to previous frameworks of leadership, the current project depicted detailed team leadership processes and structures critical to the success of action teams. These processes include adaptation of team structures in response to task urgency, team experience, and distance; the fluidity of leadership functions performed by various members of a team; and a multitude of leadership functions. The contribution of the project should be mainly in its depiction of the complex and fluid nature of team leadership for teams that are multi-disciplinary, highly learning oriented, and the hypothetical impacts of distance.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA417104>

TR 1137

Lessons Learned On Collective Efficacy in Multinational Teams. (2003). Karrasch, A.I. (DTIC No. ADA414109).

This report documents a focused look at the dynamically integrated beliefs a team develops concerning their capabilities (collective efficacy) in multinational teams. The results of this research indicated that the level of collective efficacy for the Stabilization Force in Bosnia-Herzegovina appears relatively strong, as would be expected, given their history of success. Efficacy at the organizational level was not as strong and not as homogenous as compared to primary team level, indicating that primary teams have more of a shared sense of capability. A discussion of the situational and individual level variables expected to impact the formation of efficacy is included. Finally, this report highlights some lessons learned about conducting research with multinational teams.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA414109>

TR 1138

Virtual Environments for Dismounted Soldier Simulation, Training, and Mission Rehearsal: Results of the FY 2002 Culminating Event. (2003). Knerr, B.W., Lampton, D.R., Thomas, M., Comer, B.D., Grosse, J.R., Centric, J.H., Blankenbeckler, P.N., Dlubac, M.D., Wampler, R.L., Siddon, D., Garfield, K.A., Martin, G.A., & Washburn, D.A. (DTIC No. ADA417360).

This report describes the activities and results of the final year culminating event (CE) of the "Virtual Environments for Dismounted Soldier Simulation, Training and Mission Rehearsal" Science and Technology Objective (STO). This STO was conducted jointly by the U.S. Army Research Institute, the U.S. Army Simulation, Training, and Instrumentation Command (STRICOM), and the U.S. Army Research Laboratory. This four-year effort (FY99-FY02) was focused on overcoming critical technological challenges that prevented high fidelity dismounted Soldier simulation. The objectives of the CE were to integrate and evaluate the technologies developed during the year. The key technologies included: a Dismounted Infantry Virtual After Action Review (AAR) System; new behaviors and improved operator control for Dismounted Infantry Semi-Automated Forces (DISAF); Soldier control of DISAF through Voice Recognition and Synthesis; enhancements to the Soldier simulator, the Soldier Visualization Station (SVS); and a dynamic terrain server. The CE provided a realistic and challenging test of the systems and capabilities under development. The results include lessons learned, feedback from Soldiers obtained by questionnaires and group interviews, and observer rating of leader and squad performance.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA417360>

TR 1139

Predicting Rapid Decision Making Processes Required by the Dismounted Objective Force Warrior. (2003). Littleton, E.B., & Freeman, J.T. (DTIC No. ADA419472).

This report was developed under a Small Business Innovation Research Program, Phase I. The technology of the Objective Force Warrior (OFW), though still in the conceptual stage, promises to revolutionize warfare by providing information in unprecedented volume, particularly about the locations of threats and other human participants. Ensuring that Soldiers employ OFW technologies well may require a second revolution that focuses on training decision-making skills of war fighters. Predicting the effects of conceptual OFW technologies on decision makers is challenging. This research addresses this problem by laying the groundwork for a simulator that will accommodate a full research program—from discovering and validating requirements to building training—and enable the Army to observe future technology effects. The work triangulated a series of methods—knowledge elicitation methods, analyses, and exercises on a simulation test bed—to systematically examine and test hypotheses concerning decision making with future battle technologies. Our exercise of the test bed suggests there will be positive effects of the technology, as well as unintended negative effects. For example, we observed that threat-sensing technology simulated in this test bed simplified and focused the operation, but may have lulled players into a false sense of confidence in the technology's capabilities.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419472>

TR 1140

Training Effectiveness Evaluation of the Full Spectrum Command Game. (2004). Beal, S.A., & Christ, R.E. (DTIC No. ADA419670).

Fifty-four officers in the Infantry Captains Career Course at Fort Benning, Georgia, participated in a training effectiveness evaluation of a video game named Full Spectrum Command (FSC). Half were

assigned to play FSC and participate in normal course work for commanding a light Infantry company in urban offensive operations; the other half did only the normal course work. Pre-FSC measures were for military experience, general cognitive ability, and decision-making style. A questionnaire administered to officers who played FSC documented their sense of personal involvement in the FSC environment, their perception of the training value of the game, and their opinions of FSC strengths and weaknesses. Officers in both groups were assessed individually for the adaptiveness of their decision-making behavior as the commander of a light Infantry company during a tactical exercise using the Janus simulation. Shortcomings in experimental procedures confounded between-groups comparisons for adaptive decision-making behaviors, but other results suggest FSC can provide tactical experiences with potential training value. Prior military experience was related to personal involvement with FSC, perceived training value of FSC, adaptive decision-making behavior in Janus, and decision-making style. Officers who played FSC identified its strengths and changes desired in future versions of the game.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419670>

TR 1141

Coding Verbal Interactions in a Prototype Future Force Command and Control Simulation. (2004). Durlach, P.J., Bowens, L.D., Neumann, J.L., & Carnahan, T.J. (DTIC No. ADA421089).

As the U.S. Army undergoes transformation, it will need reliable means of measuring and training complex new skills. Acquiring those will require analysis of human behavior in the context of human-in-the-loop simulations of Future Combat Systems (FCS) still in the concept exploration phase. The goal of the present effort was to establish and measure command group behavior observed in such a human-in-the-loop simulation via analysis of the verbal interactions of the command group. A coding scheme for command group verbal interactions was devised and applied to several simulation runs in which a command group of 4 experienced Army Lt. Col.'s controlled an array of simulated unmanned air and ground platforms to accomplish a deliberate attack mission. This report documents the development of the coding scheme, the analysis results, and considers various other approaches for analyzing verbal data.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA421089>

TR 1142

How Formal Training Affects Soldier Attitudes and Behaviors Towards Digitization. (2004). Barnett, J.S. (DTIC No. ADA421864).

This research measured how formal training affects Soldier patterns of behavior and attitudes towards digitization. A set of questionnaires was administered to 24 enlisted Soldiers and 12 officers attending formal classroom training for the Force XXI Battle Command, Brigade and Below (FBCB2) digital system. One questionnaire was administered before training, and a second after training was complete. The questionnaires assessed Soldier opinions of FBCB2 usefulness and also their attitudes associated with using the system. Soldier responses before and after training were compared to assess how training affected their attitudes and behaviors towards digitization. Results showed Soldiers generally feel FBCB2 is useful and worth the additional effort required to learn the systems. It also indicated that formal training in digital systems has a significant positive effect on Soldiers' attitudes and behaviors towards digital systems. The results also seem to indicate that training may help Soldiers avoid maladaptive behavior patterns that have been identified in other areas. Behaviors such as disuse or over-reliance on automated systems, a significant problem in other areas, were relatively rare for Soldiers attending formal training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA421864>

TR 1143

Intelligent Tutoring System for Teaching Battlefield Command Reasoning Skills: Phase 2. (2004). Domeshek, E.A. (DTIC No. ADA421970).

This report documents Phase II efforts to develop a Socratic Intelligent Tutoring System (ITS) for Teaching Battlefield Command Reasoning Skills. The ultimate goal of this research program is to develop new ITS techniques and technology for teaching skills that cannot be taught as simple methods and procedures to be followed. Achieving expert levels of proficiency in professional-level reasoning skills—whether for battlefield commanders or for professionals in a wide range of other fields—requires extensive practice, coaching, and feedback. Students must be given a chance to drill on detailed and situation-specific knowledge, as well as high-level thinking habits and skills applicable across diverse situations. We studied exemplary coaching by observing tutoring sessions centered on Tactical Decision Games. We analyzed those sessions to identify behaviors that could be enacted and controlled by an

automated Socratic tutor. We explored techniques and ultimately built an operational prototype exhibiting many of the key behaviors identified. We also built extensive tools to support authoring of the prototype's knowledge and behavior. This work has produced extensive data, analysis, and implementation, advancing our understanding of, and ability to model, professional-level Socratic tutoring.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA421970>

TR 1144

Identifying and Validating a Model of Interpersonal Performance Dimensions. (2004). Carpenter, T.D., & Wisecarver, M.M. (DTIC No. ADA421920).

Current models of job performance recognize its multidimensional nature but do not provide a comprehensive picture of the interpersonal requirements of jobs. As a first step toward developing a more cogent and comprehensive understanding of interpersonal performance, a taxonomy of the interpersonal requirements of jobs was developed and validated. An extensive literature review of interpersonal performance behaviors was conducted to develop a proposed taxonomy of interpersonal performance. Two studies were then completed to validate the proposed taxonomy. In the first study empirical evidence for the taxonomy was gathered using a content analysis of critical incidents taken from a job analysis. In the second study, confirmatory factor analysis was used to recreate the model based on ratings of the importance of and time spent on each interpersonal performance behavior identified in the model. Raters represented a variety of Army jobs and ranks. Confirmatory factor analyses supported the proposed taxonomy. Results also indicated that the criticality of several dimensions of interpersonal performance increased with increasing enlisted ranks. The importance of the results toward the identification of predictors of interpersonal performance is discussed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA421920>

TR 1145

Validation of Measures Designed to Maximize 21st Century Army NCO Performance. (2004). Knapp, D.J., McCloy, R.A., & Heffner, T.S. (DTIC No. ADA423602).

The NCO21 research program was undertaken to help the U.S. Army plan for the impact of future demands on the noncommissioned officer (NCO) corps. The performance requirements and associated knowledges, skills, and aptitudes (KSAs) expected of future successful NCOs were used as a basis for developing tools that could be incorporated into an NCO performance management system geared to 21st-century job demands. This report documents the concurrent criterion-related validation of the predictor measures. The predictor measures include the Armed Services Vocational Aptitude Battery (ASVAB), Assessment of Individual Motivation (AIM), and Biographical Information Questionnaire (BIQ), which are already used in the Army for other purposes. A written Situational Judgement Test (SJT), the Experience and Activities Record (ExAct), Personnel File Form (PFF21), and a semi-structured interview were developed for this project. Two types of rating scale instruments were developed for gathering criterion data. The Observed Performance Rating Scales ask supervisors to rate how well Soldiers perform in their current jobs and the Expected Future Performance Rating Scales have them predict how their Soldiers would perform in future conditions. All of the predictors yielded one or more scores that were significantly correlated with the performance ratings. The SJT, interview, and some scores from the AIM and BIQ showed the most incremental validity over the current system. In this concurrent validation, the predictors were more highly correlated with performance at the E5 level compared to the E6 level.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA423602>

TR 1146

PC-Based Training to Improve Infantry Situation Awareness. (2004). Strater, L.D., Reynolds, J.P., Faulkner, L.A., Birch, D.K., Hyatt, J.R., Swetnam, S., Metzdorf, S., & Endsley, M.R. (DTIC No. ADA425351).

It is widely recognized that Situation Awareness, SA, provides the foundation for decision-making and action for Infantry warfighters. Recent research has investigated differences in SA between experienced and inexperienced officers, as well as areas of SA deficits. This Infantry Situation Awareness Training research program marks an initial effort to train Infantry warfighters in the skills necessary for developing superior battlefield SA. A two-module training program targeted at Infantry Platoon Leaders was developed. The SA Planner teaches time management and task prioritization skills, while the SA Trainer focuses more globally on developing knowledge bases and understanding the information requirements necessary to develop SA. Validation testing was conducted by giving the SA Trainer to a group of Royal Norwegian Naval cadets prior to combat fatigue exercises. Results show that trained

cadets were more likely to correctly refuse to attack a civilian refugee camp than untrained cadets. In addition, trained cadets indicated that they had to spend more mental effort developing higher-order SA and determining how to best meet their goals. Even with minimal time, some training effects were found. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA425351>

TR 1147

A Dialog Based Intelligent Tutoring System for Practicing Battle Command Reasoning. (2004). Ryder, J.M., Graesser, A.C., Le Mentec, J.C., Louwerse, M.M., Karnavat, A., Popp, E.A., & Hu, X. (DTIC No. ADA425430).

This Phase II Small Business Innovation Research (SBIR) developed a dialog-based intelligent tutoring system (ITS) for interactive self-training of battle command reasoning. The system, called "Automated Tutoring Environment for Command" (ATEC), adapted the dialog management capability from AutoTutor (a dialog-based tutor developed by Graesser and colleagues at the University of Memphis) and integrated it with a cognitive model-based instructional agent (using CHI Systems' iGEN cognitive agent framework). The ATEC system presents a battlefield situation and then initiates a dialog between a virtual mentor (instructional agent) and a student as they collaboratively discuss the situation. The virtual mentor poses questions, evaluates student responses, determines the sequence of questions, and ultimately assesses performance on the basis of the specificity of questioning and the depth of probing and hinting that is needed to adequately answer the questions. The results of the ATEC development effort showed some of the capabilities and limitations of tutorial dialog systems, and indicated areas for additional research and development.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA425430>

TR 1148

Competency Based Future Leadership Requirements. (2004). Horey, J., Fallesen, J.J., Morath, R.A., Cronin, B., Cassella, R., Franks, W., & Smith, J. (DTIC No. ADA426059).

The purpose of this research was to develop leadership requirements for the future Army. A competency framework that is used consistently throughout the force and that focuses on the functions of leadership will help align training, development, and performance management processes and better convey what leaders need to do. Numerous considerations were combined to generate the framework including: identification of the future of technological, geopolitical, and demographic factors; review of leadership theory; review of the evolution of Army leadership doctrine; identification of literature sources of leadership requirements; specification of the relationships leaders have with others; and comparisons of competency frameworks from the other military services. Through an iterative process, analysts developed competencies, components, and sample actions that were then reviewed by subject matter experts. A core leadership competency framework was developed that includes eight competencies and 55 components. The proposed core leadership competency framework serves to provide an analytically based description of leader requirements for the future. The incorporation of the framework into leader development processes is discussed as well as how the framework can be presented in doctrine.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA426059>

TR 1149

Emotional Synthetic Forces. (2004). Henninger, A.E., Chown, E., & Jones, R. (DTIC No. ADA426234).

Report developed under a STTR contract number DASW01-99-C-0037 entitled Emotional Synthetic Forces. The objective of this research was to make the decision-making process of complex agents less predictable and more realistic, by incorporating emotional factors that affect humans. To this end, researchers adopted an approach that promotes the emergence of behavior as a result of complex interactions between factors affecting emotions, integrated in a connectionist-style model, and factors affecting decision-making, represented in a symbolic model. This report explains the model sub-components, integration, and testing, which includes a description of the behaviors we used in the development of prototype, the design of experiments, a representative set of behavior patterns that emerged as a result of exercising the model over the design space, and recommendations for future work. Results of prototype suggest an effective means of increasing the variability of computer-generated forces (CGF) behavior in manner consistent with modern day emotional theories.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA426234>

TR 1150

Assessment of the Unit Focused Stability Manning: Year 1. (2004). Smith, M.D., & Hagman, J.D. (DTIC No. ADA428049).

The U.S. Army Alaska's 172nd Stryker Brigade Combat Team (SBCT) is currently serving as the test unit for implementation of the newly developed Unit Focused Stability (UFS) manning system. Under UFS, combat forces are formed, trained, and deployed as intact units, with resulting stability and opportunity for accretive training serving to increase combat skills and cohesion above levels normally achieved in conventionally manned units. During the 172nd SBCT's anticipated operational cycle, the impact of UFS will be formatively assessed to determine (a) the long-term impact of personnel stabilization on unit cohesion, (b) factors/conditions that enhance or detract from this cohesion, and (c) stabilization-related lessons learned for improving future UFS implementation. Assessment methods will include the use of surveys, interviews, and focus group discussions. Results from this first year revealed robust levels of cohesion and unit climate variables in spite of widespread concerns that UFS might negatively impact senior NCO and junior officer career progression. Major recommendations for improvement of UFS implementation included: (a) proactive distribution of comprehensive UFS ground rules, and (b) mitigation of UFS' perceived negative impact on career progression. Next year's assessment efforts will focus on platoon-level measurement of personnel external (i.e., unprogrammed losses/gains) and internal (i.e., duty position changes) turbulence and determination of the relation between turbulence and unit cohesion.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA428049>

TR 1151

Army Enlisted Personnel Competency Assessment Program. Phase 1: Volume 1. (2004). Knapp, D.J., & Campbell, R.C. (DTIC No. ADA427949).

In the early 1990s, the Department of the Army abandoned its Skill Qualification Test (SQT) program due primarily to maintenance, development, and administration costs. Cancellation of the SQT program left a void in the Army's capabilities for assessing job performance qualification. To meet this need, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) instituted a 3-year program of feasibility research related to development of a Soldier assessment system that is both effective and affordable. The PerformM21 program has two mutually supporting tracks. The first is a needs analysis that will result in design recommendations and identification of issues related to implementation of a competency assessment program. The second track is a demonstration of concept – starting with a prototype core assessment targeted to all Soldiers eligible for promotion to Sergeant, followed by job-specific prototype assessments for several Military Occupational Specialties. Experience with the prototype assessments will influence elaboration of the operational program design recommendations. The present report describes the needs analysis work and subsequent Army competency assessment program design recommendations as they stand at the end of the first year of the PerformM21 effort. A variety of areas are discussed, including program goals and policies as well as test content, design, development, and administration considerations.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA427949>

TR 1152

Army Enlisted Personnel Competency Assessment Program. Phase 1: Volume 2. (2004). Campbell, R.C., Keenan, P.A., Moriarty, K.O., & Knapp, D.J. (DTIC No. ADA428294).

This report documents and summarizes the activities in developing a prototype test as part of a Demonstration Competency Assessment Program (DCAP) targeted for use as a promotion tool for advancement of Army Soldiers from pay grade E4 to E5. The test consists of four Army wide core content areas: Leadership, Training, Army History and Values, and Basic Soldiering Tasks (Common Tasks). The report outlines the role of the advisory NCO Council (Army Test Program Advisory Team – ATPAT), the development of the test blueprint, and item development and review. It outlines the plans for Phase II: Pilot testing.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA428294>

TR 1153

Applying Consensus Based Measurement to the Assessment of Emerging Domains. (2005). Legree, P.J., Psotka, J., Tremble, T.R., & Bourne, D.R. (DTIC No. ADA430810).

Situational judgement tests have been developed in the fields of Industrial/Organizational and Cognitive Psychology to predict performance and to evaluate theories of cognition. Production of these scales has

usually required the opinions of subject matter experts to produce scoring keys or criterion data to compute empirically based standards. A simple, elegant procedure is considered that allows examinee responses to be scored as deviations from the consensus defined by the response distributions of the examinee sample. This approach is termed "Consensus Based Measurement" and has been applied to validate scales in domains, such as Emotional Intelligence, that lack certified experts and well-specified, objective knowledge. Data are summarized demonstrating substantial convergence between situational judgement test scores computed using expert and examinee based scoring standards for which substantial expert and examinee data are available. The convergence indicates that examinee response distributions may be used to score situational judgement tests when expert responses are not available. Validity data for situational judgement scales that are scored with this approach are summarized. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA430810>

TR 1154

Interactivity, Communication, and Trust: Further Studies of Leadership in the Electronic Age. (2005). Burgoon, J.K., Weisband, S., & Bonito, J. (DTIC No. ADA433229).

Successful leadership and team performance are built on a foundation of trust and effective communication between and among leaders and team members. A broad range of new communication technologies, now ubiquitous in today's military, allow leaders and their teams to work remotely from one another. Our current research program, consisting of 11 laboratory and field experiments, seeks to answer the question of how these technologies affect leaders' ability to foster high trust, morale, and performance with their team by testing the principle of interactivity: whether messages sent and received are coherently and tightly linked, create coordinated communication, and are marked by involvement, mutuality (sense of connection, receptivity, common ground, mutual understanding), and individuation (clear and detailed knowledge of sender and receiver identities). Proximal, real-time, and multi-sensory message exchange technologies promote interactivity. We have continued to investigate which forms of electronic communication help or hinder interactivity, as well as whether task load—the degree to which a task is cognitively and/or physically effortful and demanding—alters interactivity and trust. Our results offer best communication practices that will help leaders maximize trust when needed, dampen interactivity and trust when skepticism is needed, and prevent unintended negative consequences when using electronic media. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA433229>

TR 1155

Dismounted Infantry Decision Skills Assessment in the Virtual Training Environment. (2005). Gately, M.T., Watts, S.M., Jaxtheimer, J.W., & Pleban, R.J. (DTIC No. ADA432164).

This report was developed under a Small Business Innovation Research Program, Phase II. The Virtual Soldier Skills Assessment (ViSSA) is a software system that operates in a DIS/HLA-based virtual environment. ViSSA can automatically detect significant events in virtual exercises. It also has a logger/playback module to allow to assist the trainer or Observer/Controller (O/C) in highlighting these significant events during the after action review (AAR). The system is designed to assess warfighter skills, decision-making, and situational awareness. Event/Condition/Action rules are designed by experts for consistent assessment against Doctrine. ViSSA can reduce training and assessment costs by minimizing the burden on the O/C and assisting in orchestrating an effective AAR by providing the rapid replay of significant events, summary statistics, and critical decision points during the exercise. Training for urban operation missions is limited by time, cost, and safety factors. Virtual environment technologies like ViSSA have the potential to provide the Army with a training capability to meet these demands to optimize human performance by enhancing Soldier decision-making skills. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA432164>

TR 1156

Surrogates for Future Force Warrior Training Research. (2005). Livingston, S.C., Root, J.T., Mast, R.L., & Gilbert, P.A. (DTIC No. ADA433353).

This report describes the design, organization, and capabilities of a new U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) Warfighting Experimentation Lab at Fort Benning, Georgia. It was developed to provide the ARI staff with a reach forward ability in training research. As the DoD Training Transformation (T2) gets underway, the Army is now working on its transformation as an ongoing perpetual function. Because of the flux inherent in perpetual transformation, many of its proposed future developments are and will continue to be abstract with varying kinds and amounts of related empirical data. Thus there was a need for the Warfighting Experimentation Lab to provide a

flexible simulation environment in which researchers can examine proposed and evolving tactical technologies and innovations. A major design consideration for the ARI facility was to mirror the equipment in the Infantry School's own Simulation Center, using parallel surrogate equipment.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA433353>

TR 1157

Personnel Turnover and Team Performance. (2005). Levine, J.M., Moreland, R.L., Argote, L., & Carley, K.M. (DTIC No. ADA433897).

This project was designed to provide information about personnel turnover in work teams. Two tasks (production, decision making) and two methodologies (laboratory experimentation, computer simulation) were employed. Experimental studies using the production task investigated how newcomers affect a team's transactive memory system -- a shared mental model about how task competencies are distributed across members. Experimental studies using the decision-making task investigated conditions under which newcomers can produce innovation by altering the team's task strategy. Simulation studies extended the laboratory work in various ways (e.g., by investigating turnover effects in larger social units and over longer time periods). Results indicated that providing team members with information about a newcomer's skills prior to turnover eliminated the negative impact of turnover on both transactive memory and team performance. Newcomers who sought to change the team's task strategy were more effective when the team was assigned (rather than chose) its initial strategy and failed (rather than succeeded) prior to newcomers' arrival. Simulation studies showed, among other things, that the value of transactive memory varies as a function of group size and task difficulty. This project demonstrates the utility of multi-method research on personnel turnover and suggests a number of questions for future research.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA433897>

TR 1158

The Interactive Effect of Feedback Sign and Task Type on Motivation and Performance. (2005). Kluger, A.N., & Van-Dijk, D. (DTIC No. ADA433894).

Providing personnel with feedback is like gambling in the stock exchange: on average, you gain, yet the variance is such that you have a 40% chance of a (performance) loss following feedback (Kluger & DeNisi, 1996). The obvious question is then when feedback leads to gain. A hunch is that the sign (positive or negative) of feedback matters. Yet, the vast literature has no clear specifications regarding when and how feedback sign influences motivation (e.g. Kluger & DeNisi, 1996). This research, following Van-Dijk and Kluger (2004), suggests that feedback sign effects can be explained by self-regulation theory (Higgins, 1997, 1998) which distinguishes between two regulatory foci: prevention versus promotion. They proposed that positive (negative) feedback motivates more under promotion (prevention) focus. Here, we suggest that the nature of the task determines regulatory focus. Prevention-inducing tasks are tasks that require vigilance and cautiousness (e.g. a guarding duty, a safety task), while promotion-inducing tasks are tasks that require openness and creativeness (e.g. planning a battle's strategy, developing a new training program). Consistent with our prediction, the results of two experiments showed that negative feedback is most effective for prevention tasks, while positive feedback is most effective for promotion tasks.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA433894>

TR 1159

Cohesion in Sports and Organizational Psychology: An Annotated Bibliography and Suggestions for U.S. Army Aviation (1993 — 2003). (2005). Grice, R.L., & Katz, L.C. (DTIC No. ADA434528).

Cohesion has long been a core concept in psychology and sociology, and has garnered a great deal of attention by both Organizational and Sports Psychology in the past decade. Although the U.S. Army has increasingly viewed cohesion as a key to the success of combat operations, a comprehensive review of the cohesion literature yielded few studies specifically addressing the construct in military rotary-wing aircrews. The purpose of this review was to examine the Organizational and Sports Psychology bodies of literature from the past decade to identify a set of characteristics associated with cohesive teams that can readily be applied to the Army rotary-wing aviation environment. The primary characteristics gleaned from this research are summarized, and a 4-dimension description of cohesion is presented. Suggestions for building cohesive Army aviation units are offered. In addition, an annotated bibliography of the key studies from which these dimensions emerged is provided.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA434528>

TR 1160

Optimizing the Speed, Durability, and Transferability of Training. (2005). Healy, A.F., Kole, J.A., Wohldmann, E.L., Buck-Gengler, C.J., Parker, J.T., & Bourne, L.E. (DTIC No. ADA434564).

Our research program aims to develop principles that optimize simultaneously all three characteristics of training – speed, durability, and transferability of learned knowledge and skills. Such simultaneous optimization would not necessarily optimize any one characteristic alone but would require instead a balanced consideration of all three characteristics. The balance of the characteristics of training is not fixed across tasks or even within a given task but rather can depend on a variety of external factors, such as fatigue and information load, that can change over time. Two studies in our program are summarized to illustrate our work. The first part of this research involves a data entry task, focusing on initiation and execution of response components under fatigue produced by prolonged work. This research demonstrates that prolonged work affects the component cognitive and motoric processes of data entry differentially and at different points in time. The second part of this research involves a duration estimation task which is in some cases coupled with a secondary articulatory suppression task. It focuses on ways to promote transfer of training. This research demonstrates that learning how to estimate durations is highly specific to the conditions of training and critically depends on whether or not a secondary task is required.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA434564>

TR 1161

Developing Effective Military Leaders: Facilitating the Acquisition of Experience Based Tacit Knowledge. (2005). Matthew, C.T., Cianciolo, A.T., & Sternberg, R.J. (DTIC No. ADA434486).

This investigation tested methods derived from Sternberg's theory of practical intelligence (Sternberg et al., 2000) that were designed to enhance experience-based (tacit) knowledge in military leadership. Two experimental studies were conducted that built on prior research. The first research effort was a quasi-experiment, in which 101 Army officers participated in theory-based reflection interventions or a no-reflection control. Results showed a strong effect of reflection condition on tacit knowledge post-test scores ($F(3, 91) = 3.743, p = .01$). In the second experiment, 235 college students participated in a theory-based reflection intervention or reflection control. Results showed a marginally significant effect of reflection condition on tacit knowledge post-test performance (Hotellings $T(1, 233) = .015, p = .06$). This investigation suggests that individual reflection interventions based on cognitive theory may promote experiential learning as measured by domain-specific, practical problem-solving.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA434486>

TR 1162

Exploring the Interaction of Implicit and Explicit Processes to Facilitate Individual Skill Learning. (2005). Sun, R., & Mathews, R.C. (DTIC No. ADA435130).

This work advances basic research in the areas of learning and training. One product is a conceptual framework, which addresses the ways explicit and implicit knowledge interact to produce skills. This framework suggests that human performance may be controlled by either a sub-conceptual knowledge base (the implicit mode) or application of a symbolic conceptual model (the explicit mode). A computational cognitive architecture, CLARION, significantly different from other existing cognitive architectures, is developed in this work to capture a range of data related to the interaction. It helps us to explain (and eventually to predict) training and learning processes. The results of the experiments support the theory of the interactions of implicit and explicit learning processes during skill acquisition. The outcomes (data, models, and theories) provide a more detailed, clearer and more comprehensive perspective on skill learning.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA435130>

TR 1163

An Assessment of the Virtual Integrated Military Operations in Urban Terrain Training System. (2005). Knerr, B.W., & Lampton, D.R. (DTIC No. ADA438315).

This report describes an assessment of the Virtual Integrated Military Operations in Urban Terrain (MOUT) Training System (V-IMTS). V-IMTS was a short-term project to speed the transition to field use of virtual simulation technology that specifically considered the integration of live and virtual training. A deployable shelter containing simulators for an Infantry squad was installed at a live MOUT site. Twenty-seven Soldiers from three squads completed two live scenarios separated by two, three, or six virtual scenarios. They then completed questionnaires to indicate how well they could perform combat activities

in the simulators, and the extent of their skill improvement. Higher rated activities included outdoor movement, identification of types of people and tactically significant areas, and individual weapons use. Lower rated activities included maneuver indoors and identifying the source and type of fire. The Soldiers and their platoon leadership believed that they received effective training. Precision movement, capture and transmission of voice communications and representation of battlefield sounds were identified as the highest priority items for improvement. It was concluded that virtual simulation technology can provide additional practice in urban operations to supplement the use of a live MOUT site. It appears to be best suited for training mission planning, situation assessment, and communication and coordination.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA438315>

TR 1164

The Influence of Trainee Gaming Experience and Computer Self-Efficacy on Learner Outcomes of Videogame Based Learning Environments. (2005). Orvis, K.A., Orvis, K.L., Belanich, J., & Mullin, L.N. (DTIC No. ADA437016).

Videogame-based environments are an increasingly popular choice to facilitate training. The purpose of the current research was to investigate the influence of two trainee characteristics, prior videogame experience and computer self-efficacy, on learner outcomes of a videogame-based training environment. In this research, 413 participants played a first-person-perspective videogame that began with a single-player section to introduce game-specific tasks, followed by a multi-player section where participants formed small teams to conduct several collaborative missions. Results indicated that computer self-efficacy and prior videogame experience were predictive of several learner outcomes such that trainees with greater computer self-efficacy and prior videogame experience reported less difficulty using the game interface and greater team cohesion, training satisfaction, and training motivation. Further, a videogame genre-specific effect was demonstrated in that only specific prior game experiences that share similar characteristics with the current training game were significantly predictive of the learner outcomes. These findings have implications for training game developers and instructors utilizing such games.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA437016>

TR 1165

Real Time Decision Alert, Aid and After Action Review System for Combat and Training. (2005). Akin, D.S., Green, G.E., Arntz, S.J., & Meliza, L.L. (DTIC No. ADA437006).

The System to Help Identify and Empower Leader Decisions (SHIELD) monitors command, control, communication, computers, and intelligence (C4I) data streams to alert leaders to situations requiring their attention (e.g., units violating a boundary). It allows leaders to temporarily dismiss alerts, have an alert go away for the rest of a mission, call up recommended courses of action, and/or call up job aids. It captures user responses to alerts in an interactive after action review (AAR) log file that can be used to host an AAR or the recipient of the alerts. SHIELD was designed to be used at any node within a C4I network while maintaining a small footprint. It has been demonstrated as a stand-alone system, as an application running on Force XXI Battle Command Brigade and Below (FBCB2) and the Command and Control Personal Computer (C2PC) without being integrated with these systems, and as an "injector" integrated with C2PC. Data collected by SHIELD to support AARs can also be used to support research on the placement of alerts within a network. Current efforts are directed towards implementing procedures to collect and analyze AAR logs across nodes to support unit level AARs and situational awareness research.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA437006>

TR 1166

Cohesion in Military and Aviation Psychology: An Annotated Bibliography and Suggestions for U.S. Army Aviation. (2005). Grice, R.L., & Katz, L.C. (DTIC No. ADA437003).

Military units rely on cohesive teams for mission success and Soldier safety. Although the U.S. Army has increasingly viewed cohesion as a key to the success of combat operations, a comprehensive review of the cohesion literature yielded few published studies specifically addressing cohesion in military rotary-wing aircrews. The purpose of this review was to examine the cohesion-related literature in military and aviation psychology from the past decade to identify a set of characteristics associated with cohesive teams that can readily be applied to the Army rotary-wing aviation environment. The primary characteristics gleaned from this research are summarized and four qualitative dimensions are suggested that appear to be related to cohesion development. Suggestions for building cohesive Army

aviation units are offered. In addition, an annotated bibliography of the key studies from which these dimensions emerged is provided.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA437003>

TR 1167

Concept Development for Future Domains: A New Method of Knowledge Elicitation. (2005). Shadrack, S.B., Lussier, J.W., & Hinkle, R.K. (DTIC No. ADA437257).

During the development of operational concepts for the Future Combat System of Systems' Unit of Employment and Unit of Action it became clear that the Army needed a more effective and efficient method for envisioning the future. A review of existing knowledge elicitation techniques indicated that current methods are not easily applied to the development of future concepts. They do not adequately address the cognitive impact new concepts and technologies have on Soldiers. In addition, existing methods do not thoroughly examine the potential unforeseen impacts the introduction of the new technology will have. The inherent difficulty in envisioning new concepts requires a more systematic approach to elicit knowledge from domain experts. This report reviews existing methods and describes a new method of knowledge elicitation to more effectively support the development of future concepts, evaluate the impact of new technology, and solve difficult problems where information and expertise are dispersed among many individuals.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA437257>

TR 1168

Development of Experimental Army Enlisted Personnel Selection and Classification Tests and Job Performance Criteria. (2005). Knapp, D.J., Sager, C.E., & Tremble, T.R. (DTIC No. ADA438314).

U.S. Army leadership recognizes first and foremost the importance of its people – Soldiers – to the effectiveness of transformation to the Future Force. Preparing for this future will affect all aspects of the Soldier management system – selection, job classification, training, and leader development. This research effort is concerned with Soldier accession and job classification and is titled New Predictors for Selecting and Assigning Future Force Soldiers (Select21). The Select21 goal is to ensure the Army acquires Soldiers with the knowledge, skills, and attributes (KSAs) needed for performing the types of tasks envisioned in a transformed Army. The objectives of the project are to (a) identify Future Force job demands and the pre-enlistment KSAs required to meet them, (b) develop measures of job performance and critical KSAs, and (c) validate the experimental predictor (KSA) measures in a concurrent criterion-related validation. This report documents efforts to develop Select21 predictor and criterion measures. The predictor set includes measures of cognitive ability, temperament, psychomotor skills, values, expectations, and experience. Performance criteria include rating scales to be completed by supervisors and peers, technical knowledge tests, a situational judgment test, and indicators of person-environment fit (e.g., job satisfaction).

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA438314>

TR 1169

Future Soldiers: Analysis of Entry Level Performance Requirements and Their Predictors. (2005). Sager, C.E., Russell, T.L., Campbell, R.C., & Ford, L.A. (DTIC No. ADA438370).

The transformation into the Future Force will continue to involve changes to missions, systems, and organizational structures. However, U.S. Army leadership recognizes the importance of its Soldiers to the effectiveness of transformation. In this regard, the Army is seeking to ensure transformation through training, leader development, and Soldier systems. This research effort is titled New Predictors for Selecting and Assigning Future Army Soldiers (Select21). Its goal is to make sure that the Army acquires Soldiers with the knowledge, skills, and attributes (KSAs) needed to perform the types of tasks envisioned in a transformed Army. This goal resulted in two objectives (a) develop and validate measures of these critical KSAs and (b) propose the use of these measures in a selection and classification system adapted to the demands of the 21st century. This report documents the procedures and results of a future-oriented job analysis designed to support the development and evaluation of such measures. Future-oriented performance requirements developed for this project include those relevant to entry-level Soldiers in (a) all future Army jobs and (b) Military Occupational Specialties (MOS) representative of two future job clusters. Each of 48 KSAs was identified and prioritized in terms of its importance to future performance.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA438370>

TR 1170

More Efficient Live-Fire Rifle Marksmanship Evaluation. (2005). Hagman, J.D. (DTIC No. ADA441267).

To examine the feasibility of enhancing live-fire rifle marksmanship evaluation efficiency on the U.S. Army's 40-round standard qualification course, 2 groups of 90 One-Station-Unit Infantry trainees fired 20 rounds from the (foxhole) supported position followed by 20 rounds from the (prone) unsupported position. A significant ($p \leq .05$) positive linear relation between the total number of targets hit and the number of hits fired under each position was found for the formative group (Group 1) and confirmed for the cross-validation group (Group 2), with the former group's predictive models accounting for about two thirds of the variance in the total hit scores of both groups. Separate look-up-table tools were then developed from pooled group data for predicting first-attempt qualification at the Marksman, Sharpshooter, and Expert levels on the basis of either supported or unsupported position hit scores. Thus, rifle marksmanship proficiency, heretofore measured on the basis of 40 rounds, can be accurately predicted on the basis of only 20 rounds fired from either fighting position, although use of scores fired from the supported position is recommended until further research can be conducted. These tools can serve as easy-to-use diagnostic instruments for (a) identifying who should continue with qualification firing (e.g., those likely to qualify after firing 20 rounds) and who should not (e.g., those unlikely to qualify after firing 20 rounds), and (b) providing empirically derived performance standards needed in the future to assess rifle marksmanship proficiency during practice, as well as qualification, on the basis of 20 rather than 40 rounds, thereby saving both range time and ammunition without sacrificing evaluative integrity.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA441267>

TR 1171

Direct and Indirect Predictors of Social Competence in United States Army Junior Commissioned Officers. (2005). Schneider, R.J. & Johnson, J.W. (DTIC No. ADM001853 / CD-ROM).

Social competence is a critically important attribute for Army officers. An officer's social competence helps determine his or her ability to foster unit cohesion, mentor Soldiers, work effectively with individuals ranging widely in personality and work style, lead effectively when deployed to foreign countries, and handle new roles and assignments. The purpose of this research was to enhance understanding of what makes an officer socially competent. To that end, we formulated and tested a theory of the direct and indirect antecedents of social performance. Our key hypothesis, mediation of the social intelligence-social performance relationship by social knowledge, was supported for three out of five social performance dimensions. Another key finding was that a video-based social knowledge measure with a constructed response format, developed specifically for this project, showed substantial criterion-related validities with the same three social performance dimensions, and appears to be a viable means of measuring social knowledge.

TR 1172

Longitudinal Examination of First Term Attrition and Reenlistment Among FY 1999 Enlisted Accessions. (2005). Strickland, W.J. (DTIC No. ADA448564).

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) developed Project First Term as a multi-year, longitudinal investigation of Soldier attrition and reenlistment among the cohort of recruits who joined the Army in Fiscal Year 1999. This effort allowed the evaluation of models of attrition and reenlistment intentions based on information contained in personnel records and collected from Soldiers who were surveyed as they entered the service, completed training segments, conducted duty assignments and left the service. These models explored reasons for attrition and reenlistment intentions, and suggested management strategies that might be employed to reduce attrition. This report provides a comprehensive description of the Project First Term methodology and analyses, and documents those results that are most relevant to the management of first term attrition.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA448564>

TR 1173

Understanding, Predicting, and Supporting Leader Self Development. (2005). Boyce, L.A., Wisecarver, M.M., & Zaccaro, S.J. (DTIC No. ADA442647).

Systematic research was performed to better understand and support individual professional self-development. Over 400 junior-military leaders participated in detailed longitudinal research to test a structural model of leader self-development. Results provide a unifying framework for understanding the

effects of individual characteristics on propensity for self-development. The model depicts a person with a mastery, work, and career-growth orientation as more motivated to perform leader self-development and more skilled at performing instructional and self-regulatory processes and therefore more likely to perform leader self-development. Further, results indicated that an organizational support tool moderated the actual performance of leader self-development activities. The implications of the results for self-development theory and for leader self-development in the Army are discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA442647>

TR 1174

Army Enlisted Personnel Competency Assessment Program. Phase 2: Report. (2006). Knapp, D.J., & Campbell, R.C. (DTIC No. ADA443794).

In the early 1990s, the Department of the Army abandoned its Skill Qualification Test (SQT) program due primarily to maintenance, development, and administration costs. This left a void in the Army's capabilities for assessing job performance qualification. To meet this need, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) instituted a 3-year program of feasibility research related to development of a Soldier assessment system that is both effective and affordable. The PerformM21 program has two mutually supporting tracks. The first focuses on the design of a testing program and identification of issues related to its implementation. The second track is a demonstration of concept – starting with a prototype core assessment targeted to all Soldiers eligible for promotion to Sergeant, followed by job-specific prototype assessments for several Military Occupational Specialties (MOS). The present report describes the second year of the PerformM21 program, in which a core examination was pilot tested and prototype test content was developed for five MOS. Further consideration was also given to program design features (e.g., delivery models, test frequency). Program design considerations include substantial attention to ways in which technology could be used to support the program and issues associated with the successful application of such tools.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA443794>

TR 1175

Virtual Environment Cultural Training for Operational Readiness. (2006). Deaton, J., Santarelli, T.P., Barba, C.A., & McCollum, C. (DTIC No. ADB315125 / Restricted).

TR 1176

Do Army Helicopter Training Simulators Need Motion Bases? (2006). McCauley, M.E. (DTIC No. ADA444549).

This report reviews the arguments and the evidence regarding the need for simulator motion bases in training helicopter pilots. It discusses flight simulators, perceptual fidelity, history of motion bases, disturbance versus maneuver motion, human motion sensation, and reviews the empirical evidence for the training effectiveness of motion bases. The section on training effectiveness reviews research from relevant sources, including: Military helicopter, military transport, commercial airlines, general aviation, fighter, and attack aircraft. In addition the author describes a Perceptual Control Theory approach to determining the information requirements for simulator-based training. The author concludes that there is a substantial body of data to support the training effectiveness of flight simulation in general; that there is virtually no evidence to support the training effectiveness of motion platforms; that motion contributes to in-simulator performance, particularly for experienced pilots; that motion cues may be beneficial for flight training in unstable aircraft and in tasks involving disturbance cues, although the evidence is weak; and that motion, noise, and vibration contribute to the realism of the simulation and, therefore, strongly influence the acceptance of a simulator by the pilot community. There is no reliable evidence that a motion base prevents simulator sickness. Instructional design is more important than physical fidelity for training effectiveness.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA444549>

TR 1177

Evaluation and Refinement of a Screening Instrument for U.S. Army Recruiters: Noncommissioned Officer Leadership Skills Inventory. (2006). Horgen, K.E., Kubisiak, U.C., Bruk-Lee, V., Connell, P.W., Penney, L.M., Borman, W.C., Pace, V.L., & White, L.A. (DTIC No. ADA446708).

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), the U.S. Army Recruiting Command (USAREC), and their contractor, Personnel Decisions Research Institutes, Inc. (PDRI) have collaborated to implement the online administration of the Noncommissioned Officer Leadership Skills Inventory (NLSI). The NLSI measures skills and abilities related to NCO performance,

including work orientation, interpersonal skills, and leadership capability. We also conducted research to validate the NLSI as a predictor of U.S. Army recruiter performance. The NLSI was successfully implemented as the first online recruiter testing administered in proctored settings worldwide. The validation results indicate that the NLSI predicts recruiter training attrition and recruiters' duty performance, as measured by individual recruiter production (e.g., signed contracts).
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA446708>

TR 1178

Wargaming Effectiveness: Its Conceptualization and Assessment. (2006). Cianciolo, A.T., & Sanders, W.R. (DTIC No. ADA447973).

Wargaming arguably is the most important collective activity occurring during operational planning. The need to understand, develop, and support battle staff wargaming has never been greater than it is now. The purpose of the present research was to determine the constructs that comprise effective wargaming and to explore methods for assessing these constructs. Cognitive task analysis was used to develop a conceptual framework for understanding the knowledge, skills, and other attributes that comprise the individual and team-related determinants, processes, and outcomes of effective wargaming. This framework was used as the basis for designing and implementing assessments. This initial exploration indicates that assessments derived from the wargaming conceptual framework can be feasible to administer and be reliable and valid assessments of their related psychological constructs. If extended and applied, this work could escort operations command and control teams into the future through a better understanding of how to develop and support their collective mission planning competence.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA447973>

TR 1179

Cooperative Interface Agents for Networked Command, Control, and Communications: Phase 2. (2006). Wood, S.D., Zaiantz, J., & Lickteig, C.W. (DTIC No. ADA455243).

Report developed under a Small Business Innovation Research Program 2000.2 contract for topic A02-024. This Phase II research advanced the Phase I approach to enable improved human-system interaction of mixed human and robotic elements for a company-sized unit. The research reported here explored the utility of intelligent user interfaces for command and control tasks. A system prototype was developed using a virtual simulation environment, Soar-based intelligent agents, and a standards-based communications infrastructure. The prototype was evaluated by active duty Army officers using think aloud and situational awareness protocols conducted during a simulated urban mission. Results from the evaluation indicate that cooperative interface agents may be a practical technique for reducing command and control complexity, especially when manned and unmanned forces are integrated. Although this technique was demonstrated in a relatively simple simulation environment, further research is warranted to assess scalability and usability when applied to more knowledge-rich, real-world environments.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA455243>

TR 1180

An Interactionist Analysis of Soldier Retention across Career Stages and Time. (2006). Chen, G., & Ployhart, R.E. (DTIC No. ADA448543).

Ever since the Army became an All-Volunteer force, it has become critical to understand the factors influencing Soldiers' retention decisions. While the Army can implement short term solutions to problems resulting from turnover (e.g., increasing recruitment efforts), a long term solution requires an understanding of the dynamics driving the current levels of attrition. We propose an integrative, interactional model of retention, with links among general cognitive ability, situational variables (work characteristics and social support), job attitudes and motivation, and retention. In general, it is proposed that job attitudes and motivation mediate the impact of ability and situational variables on retention outcomes. Furthermore, the model considers the influences of career stage and changes over time in job attitudes and motivation on the retention process. Findings provided mixed support for the theoretical model of relationships. A unique contribution of our research over and above previous research is the longitudinal examination of several relationships as they unfold within Soldiers over time, and across different career stages. In particular, a key finding was that, irrespective of absolute levels of job attitudes (i.e., mean levels across time), more negative changes over time in job attitudes were associated with greater inclination to leave the U.S. Army.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA448543>

TR 1181

Nonverbal Communication and Aircrew Coordination in Army Aviation: Annotated Bibliography. (2006). Katz, L.C., Kambe, G., Kline, K.F., & Grubb, G.N. (DTIC No. ADA451484).

The Army's Aircrew Coordination Training (ACT) programs emphasize the importance of verbal communications between crewmembers during mission execution. While this is a critical component of effective crew coordination, little attention has been directed towards the influence of nonverbal communication on effective crew coordination. Nonverbal communication transactions occur in the cockpit, but the extent to which they supplement verbal communication and their contribution to safe mission performance remain unclear. The report documents online research materials pertaining to (but not limited to) aircrew coordination, communication classification schemas, nonverbal communication (within aviation and other applicable fields), and team training. A review of the literature was conducted with the results compiled into a database containing the relevant articles, and a categorization schema for future research in nonverbal communication in cockpit environments was recommended.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA451484>

TR 1182

Locus of Control, Attribution Theory, and the "Five Deadly Sins" of Aviation. (2006). Stewart, J.E. (DTIC No. ADA452056).

The construct of Locus of Control (LOC) has been shown to predict a broad range of attitudes and behaviors, including risk taking and risk management, the performance of multiple tasks, distractibility, and the subjective perception of time. The above topics and many others have applicability to aviation settings. Over the past two decades, a few researchers have examined the relationship between LOC and hazardous attitudes, pilot errors, and other variables relating to safety and risk management. Most of this work has been correlational, and, in many instances, sample size has been quite small. The present paper reviews this work and other areas of research, which, though not specifically tied to aviation, have potential relevance to it. These include concepts from attribution theory, such as the optimism bias, in which people tend to attribute greater competency and lesser vulnerability to themselves than to similar others. Suggested applications of established and existing research in applied areas of social psychology are examined, with a focus on their relevance to aviation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA452056>

TR 1183

Review of Aviator Selection. (2006). Paullin, C., Katz, L.C., Bruskiwicz, K.T., Houston, J., & Damos, D.L. (DTIC No. ADA455302).

In 2004, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) awarded the Selection Instrument for Army Flight Training (SIFT) contract to Personnel Decisions Research Institutes (PDRI). The Army's stated objectives were as follows: (1) Develop a computer-based and web-administered selection instrument for Army flight training with emphasis upon aptitudes for Future Force aviator performance within the Future Combat Systems environment; (2) Develop an aviator selection instrument that corrects or minimizes risks associated with several deficiencies identified in the current selection instrument -- the Alternate Flight Aptitude Selection Test (AFAST); (3) Develop the selection instrument so that the Army will be able to rapidly assess its current performance as a predictor, revise the instrument when necessary, and adapt its application to selection for related occupational categories such as Unmanned Aerial Vehicle Operators and Special Operations Aviators; and (4) Maximize utilization (by inclusion or adaptation) of existing tests as may be found in use or under development within the Department of Defense. The project was divided into several tasks. This report summarizes efforts conducted in relation to Task 1: Review the existing Army aviation accession process and relevant literature. The overall goal of Task 1 was to collect information that could be used to produce a rational decision on a specific selection and testing strategy. This report presents a review of research in the aviator selection and general personnel selection domains. That information was used to identify knowledge, skills, attributes, and other factors that should be included in a job analysis focusing on the Army aviator job. It was further used to develop a recommended strategy for an Army aviator selection battery.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA455302>

TR 1184

Instructional Features for Training in Virtual Environments. (2006). Singer, M.J., Kring, J.P., & Hamilton, R.M. (DTIC No. ADA455301).

The U.S. Army is committed to using interactive simulations to provide training for Soldiers. Virtual Environment (VE) and gaming technology may allow the U.S. Army to cost-effectively conduct planning, training, and rehearsal activities for both individual and collective dismounted Soldier tasks. The simulation technology also supports or provides stimuli that could enhance learning through instructional strategies, tactics, and instructional features. Research on effects of specific VE system characteristics and instructional applications must be performed to establish the benefits, problems, and guidelines for training and rehearsing complex activities and tasks using VE technology. This experiment investigated the training effect of instructional interventions in VE for training representative Soldier tasks. The research addressed Interrogative Coaching and an Attention-Direction Instructional Feature on initial skill acquisition of dismounted Soldier tasks incorporating basic recognition and decision skills. The results indicate that there is no initial learning advantage to the type of Attention Direction feature that was used, and that the Interrogative Coaching did seem to aid the skill acquisition of the more complex Bounding Overwatch task. The results are also being used to shape continued investigations into the use of instructional strategies, tactics, and features in VE simulations for dismounted Soldier tasks.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA455301>

TR 1185

Personality Profiles of Experienced U.S. Army Aviators Across Mission Platforms. (2006). Grice, R.L., & Katz, L.C. (DTIC No. ADA457567).

To address the selection-related question, "What does the personality profile of the Army aviator of today look like?" 75 experienced Army aviators attending advanced leadership training completed the Revised NEO Personality Inventory, with scores depicting the five personality factors of: neuroticism, extraversion, openness, agreeableness, and conscientiousness. To address the classification-related question, "Are there certain personality profiles that distinguish among attack, scout, cargo, and utility pilots?" factor scores and their subsumed facet scores were compared across respondents representing the four mission platforms. Overall sample profiles and score differences among platforms are presented.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA457567>

TR 1186

Leader Experience and the Identification of Challenges in a Stability and Support Operation. (2006). Nobel, O.B., Zbylut, M.L., Fuchs, D., Campbell, K., Brazil, D., & Morrison, E. (DTIC No. ADA455185).

This paper describes exploratory research that examined the impact of military leadership experience on how individuals frame a type of operating environment encountered by Soldiers deployed to the Middle East. Sixteen captains and 25 cadets from the United States Military Academy watched a film depicting a food distribution operation in Afghanistan and then indicated the key leadership challenges and decisions that they believed were present in the scenario. Content analysis resulted in 21 dimensions of leadership activities and four higher-level categories representing tactical decision-making, managing relationships with subordinates and other Soldiers, situational challenges, and handling local civilians and warlords. Consistent with previous research on expert-novice differences, experienced leaders placed significantly more emphasis on tactical and leadership concerns than did inexperienced cadets. Officers' answers to open-ended questions also displayed more integrative thinking than cadets. Contrary to expectations, however, officers and cadets did not differ with respect to how they framed cultural issues embedded in the film. Results of the paper have implications for how instructors can help build the expertise of their students.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA455185>

TR 1187

Assessment of the Unit Focused Stability Manning System: Year 2. (2006). Smith, M.D., & Hagman, J.D. (DTIC No. ADA456217).

This is the second in a planned series of reports on research with U.S. Army Alaska's 172d Stryker Brigade Combat Team (SBCT) to identify (a) the impact of personnel stability (under the Unit Focused Stability [UFS] manning system) on small-unit cohesion (cohesiveness), (b) factors that might enhance or detract from (are predictive of) this impact, and (c) lessons learned for enhancing future UFS

implementation efforts. Questionnaire responses revealed that cohesion dropped over the 20-month garrison phase of the unit's 36-month lifecycle, the drop was steeper for vertical (Soldier to leader) and organizational (Soldier to unit/Army) than for horizontal (Soldier to Soldier) cohesion, and leader effectiveness and learning environment consistently contributed to the best predictive models of cohesion at each of four measurement periods. Analysis of unit records revealed that turbulence (e.g., unprogrammed gains/losses and duty position changes) was also positively related to cohesion, as long as the former occurred early in the unit's lifecycle and was not excessive. Interviews and focus group discussions revealed that primary UFS implementation concerns were the perceived negative impact of stability on junior officer and midlevel noncommissioned officer career development, confusing initial UFS guidelines, the untimeliness of their dissemination, and the inconsistency of their application. Results were interpreted to suggest that (a) stability under UFS must be coupled with effective leadership and a supportive learning/training environment in order to foster small-unit cohesion, (b) some personnel turbulence early on in a stabilized unit's lifecycle may actually be beneficial to vertical and organizational cohesion, and (c) future UFS implementation should benefit from Army efforts to address identified lessons learned, especially those impacting career development.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA456217>

TR 1188

Videogame Based Training Success: The Impact of Trainee Characteristics – Year 2. (2006). Orvis, K.A., Horn, D.B., & Belanich, J. (DTIC No. ADA457396).

Personal computer (PC)-based videogames are emerging as an increasingly popular training tool in the U.S. Army. The present research represents a follow-up investigation to Orvis, Orvis, Belanich, and Mullin (2005) with regards to the impact of trainee characteristics in videogame-based training environments. Specifically, this follow-up research examines prior videogame experience, videogame self-efficacy, and goal orientation as antecedents that maximize trainee motivation, as well as other learner choices and outcomes, in PC game-based training. In this research, participants played a first-person-perspective videogame that began with a single-player section to introduce game-specific tasks, followed by a multi-player section where participants formed small teams to conduct several collaborative missions. Prior to and after the training exercise, participants completed online questionnaires. This research extends Orvis et al. (2005) by demonstrating that these trainee characteristics, as a set, had a positive impact on trainee motivation to use the training game, trainee satisfaction with the training experience, ease in using the training game interface, team cohesion, metacognitive strategies utilized during training, and time spent engaging in the training game. The results of this research provide useful information to training game developers and instructors using videogames as training tools.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA457396>

TR 1189

U.S. Army Aviator Job Analysis. (2006). Kubisiak, U.C., & Katz, L.C. (DTIC No. ADA457239).

This report describes the job analysis performed by The U.S. Army Research Institute for the Behavioral and Social Sciences Rotary Wing Aviation Research Unit (ARI RWARU). It was part of a larger research project to develop and validate a selection system for U.S. Army rotary wing aviators, called Selection Instrument for Flight Training (SIFT). The activities performed by Army aviators and the personal attributes required to perform those activities were examined. This job analysis helped identify predictor measures subsequently used to validate the prototype SIFT test battery.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA457239>

TR 1190

Pre-to-Mid-Deployment Assessment of Unit Focused Stability Impact on Cohesion. (2006). Smith, M.D., & Hagman, J.D. (DTIC No. ADA458762).

This third in a planned series of reports on research with U.S. Army Alaska's 172d Stryker Brigade Combat Team (SBCT) sought to (a) assess the impact of heightened personnel stability (under Unit Focused Stability [UFS] manning) on cohesion, and (b) identify factors that enhance or detract from (are predictive of) this impact over the 6-month interval between unit pre- and middeployment. The same 669 Soldiers from platoons organic to three infantry battalions, one field artillery battalion, and one cavalry squadron completed paper-and-pencil questionnaires at the end of garrison-based predeployment and again midway through overseas deployment. Results revealed that horizontal (Soldier to Soldier) cohesion remained unchanged, whereas vertical (Soldier to leader) and organizational (Soldier to unit/Army) cohesion dropped from pre- to middeployment. Leader effectiveness and learning

environment were the best predictors of cohesion, especially vertical and organizational cohesion. Efforts to stabilize personnel under UFS during predeployment were perceived to have a positive (albeit limited) impact on cohesion, performance, morale, and unit commitment, with performance being the primary beneficiary. JRTC-based training during predeployment was also perceived to enhance middeployment individual and collective performance. Results were interpreted to suggest that (a) heightened UFS-imposed personnel stability will not by itself increase cohesion from pre- to middeployment, and (b) without a concerted effort to promote effective leadership and a positive learning environment for Soldiers, horizontal cohesion is unlikely to change from pre- to middeployment, whereas vertical and organizational cohesion is likely to drop.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA458762>

TR 1191

Web-Enabled Training Development Tool for Pre-Deployment and Deployed Training. (2006). Cianciolo, A.T. (DTIC No. ADA458761).

Advanced training-development processes are required to enable the rapid generation of training activities that are responsive to immediate training need. The purpose of the present Phase I Small-Business Technology Transfer (STTR) effort was to explore the design and implementation of a web-enabled "training assistant" (TA) that supports the rapid generation of contextualized training activities. To conduct the Phase I research and development, GIST and Human Resources Research Organization (HumRRO) researched the Army training process, identified methods for relieving the constraints on rapid, contextualized training development, and developed these methods into a prototype TA capability for feasibility analysis. The Phase II TA as envisioned has great potential for saving time, increasing productivity, and improving training. However, implementing the full-scale concept capability cannot feasibly be accomplished in the Phase II effort. The most feasible, influential, and immediately usable Phase II implementation of the TA concept should focus on supporting junior officers in the development of training activities not supported currently by doctrine, especially the decision-making exercise.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA458761>

TR 1192

Predictors of Attrition in the Finnish Conscript Service. (2006). Salo, M., & Siebold, G.L. (DTIC No. ADA460548).

This report describes attrition in the Finnish conscript service and identifies variables that predict attrition and their relative strength as determined by various statistical models. Subjects were 2,003 conscripts, 211 of which were separated before completing their six-month military obligation. The categories of predictors considered include conscript demographic and background variables, aptitude, mental and physical health, and pertinent attitudes and perceptions. The research extends previous research by considering a wider set of predictors, over time, and allows for generalization through the non-U.S. sample. Those separated were significantly different from those completing their military service on numerous predictor variables. Especially strong in predicting attrition were measures of the conscript's sense of military obligation, education level, physical health, criminal record, economic history, expected adjustment, age, and past behavior problems. The models accounted for 25% to 40% of the variance in attrition but were modest in their ability to correctly classify those who were separated.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA460548>

TR 1193

The Relation Between Sociometric Choices and Group Cohesion. (2006). Salo, M. (DTIC No. ADA460549).

This research examined the relations between sociometric choices and group cohesion. Data were collected from records and by survey and sociometric questionnaires given to 537 group members in 47 squads near the end of their 6 to 12 months of conscript training in Finland. Results showed moderate, significant correlations between the number of sociometric choices received and perceived cohesion such that Soldiers who were more often chosen as a friend or a combat partner felt that there was more cohesion in their group. Also, Soldiers who received more sociometric choices had higher expected personal and group performance, better performance as rated by their instructors, more positive attitudes toward military service and future refresher training, greater well-being during conscript service, and fewer exemptions from duty during their service. Groups where Soldiers made more in-group sociometric choices were also more cohesive based on questionnaire measures of cohesion. Overall, the findings suggest that sociometric individual choices and group level sociometric

cohesiveness are related modestly but positively to questionnaire-based cohesion measures and a wide range of criteria covering performance, attitudinal, and behavioral outcomes.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA460549>

TR 1194

Army Excellence in Leadership: A Multimedia Approach to Building Tacit Knowledge and Cultural Reasoning. (2007). Zbylut, M.L., Metcalf, K.A., Kim, J.M., Hill, R.W., Rocher, S., & Vowels, C.L. (DTIC No. ADA461995).

This report presents findings from a preliminary examination of the Army Excellence in Leadership (AXL) system, a leader intervention that targets the development of tacit leadership knowledge and cultural awareness in junior Army officers. Fifty-five junior officers interacted with a pilot version of a cultural awareness module from the AXL system. Results indicated that the AXL approach resulted in improvements in leader judgement on a forced-choice measure. Furthermore, results indicated that cultural issues were more salient to leaders after completion of the cultural awareness module. Reactions to training were generally positive, with officers indicating that the cultural awareness module was useful and stimulated thought. Additionally, this investigation explored the relationship between affect and learning and found that emotional responses to the AXL system were related to learning-relevant variables, such as judgement scores and officer reports that they could apply the training to their activities as a leader.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA461995>

TR 1195

Predictor Development and Pilot Testing of a Prototype Selection Instrument for Army Flight Training. (2007). Bruskiewicz, K.T., Katz, L.C., Houston, J., Paullin, C., O'Shea, P.G., & Damos, D.L. (DTIC No. ADA464020).

As part of a project by the U.S. Army Research Institute for the Behavioral and Social Sciences Rotary Wing Aviation Research Unit (ARI RWARU) to produce a selection instrument for Army flight training, several viable, existing predictor measures were identified and several new predictors were developed. The resulting prototype battery was pilot tested with 80 aviator candidates prior to beginning flight school, who provided performance data and subjective feedback. This pilot test resulted in revisions and decisions as to the predictors to be included in the prototype battery for preliminary validation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA464020>

TR 1196

Program Evaluation Metrics for U.S. Army Lifelong Learning Centers. (2007). Cianciolo, A.T. (DTIC No. ADA465470).

Lifelong Learning Centers (LLCs) comprise a suite of technologies that enable online posting of schoolhouse curricula and collaboration among distributed learners. These technologies connect the field Army to Army schoolhouses, simultaneously improving course currency and supporting training in the field. The impact of lifelong learning on organizational excellence seems clear. However, it is unknown how LLCs promote readiness using educational technology and how LLC effectiveness should be measured. The purpose of this research was to develop a comprehensive, generalizable framework for conceptualizing the effectiveness of LLCs and for capturing the drivers of success. The framework and associated metrics were used to conduct an evaluation of a pilot LLC located at Fort Leavenworth. This evaluation indicated the importance of taking a causal approach. An assessment of outcomes alone would have indicated that the initiative had achieved its goals but would have obscured the fact that some of these goals--teaching and learning effectiveness--were achieved largely independently of the use of learning technologies. The basis of the framework in theory makes it generalizable not only across current and future LLCs, but also across other blended learning initiatives, addressing a gap in the scholarly literature regarding the effectiveness assessment of educational technology.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA465470>

TR 1197

Evaluation of the Effectiveness of Flight School XXI. (2007). Wesolek, M.L. (DTIC No. ADA465655).

This research examined the effectiveness of the U.S. Army's Flight School XXI (FSXXI) flight training program in comparison to the previous (legacy) flight training program. The primary focus of the research was whether or not FSXXI produces graduates that are more proficient, and subsequently become fully mission capable pilots in fewer flight hours than graduates of the legacy flight training

program. A 2X2 repeated-measures ANOVA was conducted to compare the readiness level progression rates of graduates of the FSXXI and the legacy flight training program. These data were supplemented by an instructor pilot survey and a cost comparison. It was found that there was a statistically significant difference between the FSXXI pilots and the legacy pilots, and in each of these cases the number of hours required for FSXXI graduates to become fully mission capable pilots was lower than for legacy pilots. Additionally, there was no difference between instructors' perceptions of FSXXI and legacy pilot aptitude for the CH-47 aircraft, but there was a difference for the UH-60 aircraft. The cost comparison revealed that legacy training is substantially less expensive than FSXXI training for both types of aircraft. These findings are discussed in relation to the existing research in this area, including experiential learning and Kolb's learning cycle.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA465655>

TR 1198

Army Enlisted Personnel Competency Assessment Program. Phase 3: Pilot Tests. (2007). Moriarty, K.O., & Knapp, D.J. (DTIC No. ADA465808).

In the early 1990s, the Department of the Army abandoned its Skill Qualification Test (SQT) program due primarily to maintenance, development, and administration costs. This left a void in the Army's capabilities for assessing job performance qualification. To meet this need, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) instituted a 3-year program of feasibility research related to the development of a Soldier assessment system that is both effective and affordable. The PerformM21 program has two mutually supporting tracks. The first focuses on the design of a testing program and identification of issues related to its implementation. The second track is a demonstration of concept – starting with a prototype core assessment targeted to all Soldiers eligible for promotion to Sergeant, followed by job-specific prototype assessments for several Military Occupational Specialties (MOS). The prototype assessments were developed during the first 2 years of the research program. The present report describes work conducted in the final year of the PerformM21 program, in which five prototype MOS-specific assessments (along with the common core examination) were pilot tested on a sample of specialists/corporals.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA465808>

TR 1199

A Criterion Related Validation Study of the Army Core Leader Competency Model. (2007). Horey, J., Harvey, J., Curtin, P., Keller-Glaze, H., Morath, R.A., & Fallesen, J.J. (DTIC No. ADA468750).

This report describes the gathering and evaluation of evidence of the criterion-related validity of the Army core leader competency model. Predictor data, in the form of ratings of the competencies and components, were collected from subordinates. Criterion data, in the form of ratings of leader effectiveness, were collected from supervisors. Results showed evidence of the criterion-related validity for the Army core leader competencies. Implications for an instrument to assess the competencies and components are also discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA468750>

TR 1200

FOCUS: A Model of Sensemaking. (2007). Sieck, W.R., Klein, G.A., Peluso, D.A., Smith, J.L., & Harris-Thompson, D. (DTIC No. ADA469770).

Sensemaking is a relatively new concept that has largely been associated with Weick (1995) and his work in organizational behavior. Sensemaking refers to the set of processes involved in trying to improve one's understanding of a situation, often in response to surprise. The primary purpose of the current project was to unpack and develop the concept of sensemaking, principally by developing and testing a cognitive model of the processes involved. The resulting Data/Frame model posits a highly interactive relationship between data inputs and mental representations or "frames" for interpreting data. The Data/Frame model also proposes six key sensemaking activities for handling frames in light of (anomalous) data: Elaborating, Questioning, Comparing, Preserving, Re-framing, and Seeking. A secondary aim was to provide recommendations for training and other applications of the model that would be of direct benefit to the warfighter. To that end, several specific links to applied issues in domains such as information operations, intelligence analysis and combat systems design for UAV control have been developed and pursued. At this juncture, the concept of sensemaking and the Data/Frame model appear to be supported by the data, and also quite useful for military applications.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA469770>

TR 1201

Social Structures Affecting Army Performance. (2007). Segal, D.R. (DTIC No. ADA469700).

The Center for Research on Military Organization undertook a multi-year research program on the impact of social change on the performance of Army units and of Soldiers after the end of the Cold War in Europe and the first Gulf War. We were concerned with the shift from deterrence and defense to contingency operations, the adjustment of young adults to the military, the demographic diversity of the military, the impact of the history and culture of our military and the armed forces of other nations, and the utilization of behavioral science as a dimension of the expert knowledge of the military profession. A year after the initiation of this program, the events of September 11, 2001 changed the nature of American military organization/mission. We conducted research on Soldiers during periods of contingency operations, when six-month deployments in successive years signified high operational tempo, and a period of continuous operations, when yearlong deployments, including large numbers of reserve component personnel became more common. During this period, we studied enlistment propensity, motivations to serve, and work attitudes among American youth, adjustment to the Army, civil-military relations, gender and racial integration, organizational change, leadership, and the utilization of behavioral science knowledge.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA469700>

TR 1202

Task Difficulty and Prior Videogame Experience: Their Role in Performance and Motivation in Instructional Videogames. (2007). Orvis, K.A., Horn, D.B., & Belanich, J. (DTIC No. ADA470218).

Videogame-based environments are an increasingly popular medium for training Soldiers. This research investigated how various strategies for modifying task difficulty over the progression of an instructional videogame impact learner performance and motivation. Further, the influence of prior videogame experience on these learning outcomes was examined, as well as the role prior experience played in determining the optimal approach for adjusting task difficulty. Participants completed a game-based training task under one of four task difficulty conditions: static, increasing, adaptive-low and adaptive-high. All participants completed an identical pre-training trial, 10 practice trials varying in difficulty level according to condition, and a final performance trial. Results demonstrate that learner performance and motivation significantly improved in all difficulty conditions. Yet, contrary to expectations, no single condition maximized these outcomes relative to others. There was a significant 3-way interaction between performance, condition, and prior videogame experience. Further, prior experience was found to significantly influence these learning outcomes. Learners with greater experience consistently performed better regardless of condition. Experienced gamers also initially reported high task self-efficacy and set higher performance goals for the training task. The results of this research provide information useful to training game developers and instructors utilizing videogames as training tools.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA470218>

TR 1203

Case Method Instruction: 25 Minutes Can Make a Difference. (2007). Zbylut, M.L., Brunner, J.M., Vowels, C.L., & Kim, J.M. (DTIC No. ADA472171).

Case method instruction has been universally endorsed as an effective teaching approach, yet little empirical research provides evidence of this claim. This report describes research that investigated the importance of the discussion component of case method instruction to learning. In addition to collecting data from 182 USMA cadets, this investigation extends past research on case method instruction by incorporating the perspectives of instructors. Findings indicated that students produced better quality answers and were better able to diagnose leadership problems in the scenario after participating in discussion, even though the time allotted for discussion was relatively short. Self-reports of instructors provided corroborating evidence that the instructional approach was useful for accomplishing learning objectives and that class discussion quality was high. Additional results point to the importance of having an instructor's manual available for discussing case studies. Results also suggest that the particular case study used, Power Hungry, generalizes from an audience of junior officers and NCOs to a cadet audience.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA472171>

TR 1204

Expertise as Effective Strategy Use: Testing the Adaptive Strategies Model in the Ill Structured Domain of Leadership. (2007). McGregor, M.U., Schunn, C.D., & Saner, L.D. (DTIC No. ADA472099).

This research tested the Adaptive Strategies Model (ASM; Lemaire & Siegler, 1995) of expertise in the ill-defined domain of leadership. More specifically, we examined expert/novice differences in all components of the ASM: strategy existence, strategy choice, strategy base-rate, and strategy execution. In Experiment 1 Leadership Scenarios elicited free-text responses from undergraduates (novices), ROTC Cadets (intermediates), and U.S. Army Platoon Leaders (experts). Each response was coded into one of ten underlying Leadership Strategies thought to underlie each response, resulting in patterns of individual strategy use. Experiment 2 used a new group of experts to gather ratings of the execution accuracy of responses from Experiment 1. The results show that the ASM is able to discern expert/novice differences in strategy choice, strategy base-rate, and strategy execution. As leaders progress from novice to expert, they a) use multiple strategies across various scenarios, b) develop the ability to make optimal choices about when and where to use particular strategies, c) develop an increased sensitivity to each different strategy's base rate of success in the environment, and d) develop the ability to execute strategies more accurately. The training of ill-defined skills, such as leadership, may be improved by focusing on the four components of ASM.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA472099>

TR 1205

Concurrent Validation of Experimental Army Enlisted Personnel Selection and Classification Measures. (2007). Knapp, D.J., & Tremble, T.R. (DTIC No. ADA471963).

New Predictors for Selecting and Assigning Future Force Soldiers (Select21) is concerned with Soldier accession and job classification. The Select21 goal is to ensure the Army acquires Soldiers with the knowledge, skills, and attributes (KSAs) needed for performing well and fitting well in a transformed Army. The objectives of the project are to (a) identify Future Force job demands and the pre-enlistment KSAs required to meet them, (b) develop measures of job performance and critical KSAs, and (c) validate the experimental predictor (KSA) measures in a concurrent criterion-related validation. This report documents the method and results of the criterion-related validation. The predictor set includes measures of cognitive ability, temperament, psychomotor skills, values, expectations, and experience. Performance criteria include rating scales completed by supervisors and peers, technical knowledge tests, a situational judgement test, and indicators of person-environment fit (e.g., job satisfaction). Versions of these measures suitable for all first-term Soldiers regardless of specialty were administered to 812 Soldiers. Analyses indicated that scores from the Armed Services Vocational Aptitude Battery (ASVAB) predict both current and future performance (as assessed by future-oriented rating scales) and that the experimental predictors provided incremental validity, particularly in regard to attitudinal criteria.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA471963>

TR 1206 — Cancelled**TR 1207**

Training Requirements for Visualizing Time and Space at Company and Platoon Level. (2007). Sidman, J., & Garrity, M.J. (DTIC No. ADA471960).

Success in military operations increasingly rests on the ability of small units to counter asymmetric threats in the varied and foreign urban settings that typify the contemporary operating environment (COE). However, the physical dimensions and cultural characteristics of urban environments dramatically compress and complicate the dynamics of space and time so fundamental to visualizing and executing company and platoon operations. To help leaders visualize the interactions of space and time (VISTA), a cognitive task analysis (CTA) was conducted based on workshops with active and retired military personnel (n = 50). The CTA used a representative scenario and supporting vignettes to elicit and identify the cognitive skills required to visualize time and space patterns in the COE such as vehicle and human traffic, tribal and political boundaries, and culturally sacred structures. The CTA underscored the need for visualization training in small units and identified a related set of training principles, stages, and techniques. On that basis, prototype examples of visualization training were developed in five modules that feature scenario-based contexts, multimedia delivery, and deliberate practice. A limited evaluation of the training resulted in positive and constructive guidance for future development and utilization.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA471960>

TR 1208

Personality Profiles of U.S. Army Initial Entry Rotary Wing Students Versus Career Aviators. (2007). Grice, R.L., & Katz, L.C. (DTIC No. ADA472259).

The U.S. Army Research Institute for the Behavioral and Social Sciences Rotary Wing Aviation Research Unit (ARI RWARU) administered the Revised NEO Personality Inventory to 217 student Army aviators awaiting Initial Entry Rotary Wing training. Scores reflected the incoming aviators' standings on five personality factors: neuroticism, extraversion, openness, agreeableness, and conscientiousness. The male student factor and facet scores were then compared with a sample of male career Army aviators. Personality differences and similarities between the two samples are discussed as laying the foundation for longitudinal research.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA472259>

TR 1209 — Cancelled**TR 1210**

Foundations of Military Pilot Selection Systems: World War I. (2007). Damos, D.L. (DTIC No. ADA474611).

This report describes the development of the U.S. Army pilot selection system beginning in World War I. It starts with a review of aviation in the United States up to 1917. The phases of flight training then are described with the associated failure and fatality rates. Some cost estimates for each phase also are provided. Finally, the pilot selection system itself is described. Because the selection system was revised over time, the early system (administered from 1917 to 1918) is described first, followed by the revised system (administered from 1918 to 1919). Additions to the initial battery are described, as are the tests that were under development at the time of the Armistice.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA474611>

TR 1211

Simulator Sickness During Emergency Procedures Training in a Helicopter Simulator: Age, Flight Experience, and Amount Learned. (2007). Johnson, D.M. (DTIC No. ADA474563).

This research measured simulator sickness both before and after exposure to a helicopter simulator that was being used for emergency procedures training. Research issues were the incidence and magnitude of simulator sickness, aftereffects, susceptibility, and the effect of simulator sickness on training effectiveness. A total of 474 AH-64A (Apache) Army aviators participated in this research. The Simulator Sickness Questionnaire (SSQ) was administered prior to simulator exposure, immediately after simulator exposure, and twelve hours later. The incidence rate following simulator exposure was 68 percent. The SSQ Total Severity score was significantly larger immediately after exposure than it was prior to simulator exposure or twelve hours later. Age was significantly and positively correlated with SSQ score, after the effect of total flight hours was held constant. Flight hours did not correlate with SSQ score, after the effect of age was held constant. These results were consistent with postural instability theory. Both prior history of motion sickness and prior history of simulator sickness were significantly and positively correlated with SSQ score. The strongest susceptibility factor noted in this research was prior history of simulator sickness. SSQ score was not correlated with training effectiveness, as measured by a short behavioral test.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA474563>

TR 1212

Enlisted Personnel Allocation System Enhancements to the Recruit Quota System: A Simulation Evaluation. (2007). Sticha, P.J., Diaz, T.E., Greenston, P.M., & McWhite, P.B. (DTIC No. ADA474896).

The Enlisted Personnel Allocation System (EPAS) is an automated classification methodology that allocates applicants to jobs so as to maximize predicted performance while meeting accession requirements. It is designed to work as a subsystem of the Recruit Quota System (REQUEST). For this project the "operational" EPAS implemented an EPAS-enhanced REQUEST (EER) procedure in which MOS opportunities identified by REQUEST are reordered by EPAS optimization results. Although previous evaluations provided evidence of the utility of EPAS, none of them had addressed the EER. This field test evaluated the EER using a non-intrusive, but highly realistic simulation framework. It compared the EER and REQUEST in terms of classification efficiency and capability to meet Army accession requirements. The results of the analysis indicated that using EPAS to reorder the REQUEST opportunity list could increase the visibility of opportunities in which an applicant would be likely to

perform well, while extracting only a small penalty on the visibility of priority MOS. Despite the positive effect of EPAS on the opportunity lists, there was essentially no difference in the average predicted performance between the two conditions. The lack of a performance difference between REQUEST and the EER reflects more realistic understanding and modeling of applicant job-choice behavior and a possible loss in the classification efficiency of the ASVAB test battery. The authors discuss the limitations of the EER design, and make a case for extending the simulation capability to fully utilize the EPAS optimization result.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA474896>

TR 1213

Cognitive Task Analysis of the Battalion Level Visualization Process. (2007). Leedom, D.K., McElroy, W., Shadrack, S.B., Lickteig, C.W., Pokorny, R.A., Haynes, J.A., & Bell, J.A. (DTIC No. ADA474884).

This technical report describes the results of a cognitive task analysis to identify important skill areas associated with visualization at the battalion level of command. The analysis consisted of a review of current U.S. Army doctrinal literature, a review of battalion visualization from a psychological perspective, and a series of interviews with military officers having recent combat experience in either a command position or as a battalion Operations Officer or Executive Officer. Based on findings from the cognitive task analysis, 11 skill areas were identified as potential focal points for future training development. The findings were used to design and develop exemplar training exercises for selected skills. This report documents findings and recommendations from the cognitive task analysis, and describes the design, development, and field test of exemplar training vignettes used to evaluate the cognitive task analysis findings and recommended training methods.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA474884>

TR 1214

Training Wayfinding: Natural Movement in Mixed Reality. (2007). Savage, R. (DTIC No. ADA474915).

This report describes an experiment that investigated a prototype mixed reality (MR) system, utilizing the Battlefield Augmented Reality System (BARS), for training wayfinding. BARS is a mobile augmented reality system that uses a head mounted display (HMD) and a wireless system that tracks the users' head position and orientation. In this application a graphic representation of an office space was used as a virtual environment (VE), through which users walked using natural movement. Sixty participants in three rehearsal conditions - drawing the route on a map, actual physical space, and MR - were trained to traverse a path through a complex area as quickly and accurately as possible. Transfer of training measures included route knowledge (time to complete the route and the number of errors committed) and survey knowledge (the ability to orient oneself to the environment and identify the location of the beginning and end of the route). MR participants performed as well as those who rehearsed by drawing the route on a map, in both route and survey knowledge, but not as well as those who rehearsed in the actual space, without reporting symptoms of simulator sickness, common to work in VE. The addition of natural movement to a VE may enhance training through proprioceptive feedback.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA474915>

TR 1215

Effects of Spatial and Non-Spatial Multi-Modal Cues on Orienting of Visual Spatial Attention in an Augmented Environment. (2007). Jerome, C.J. (DTIC No. ADA475115).

Visual search tasks are known to be cognitive capacity demanding and therefore may be improved by training in an augmented reality (AR) environment. During the experimental task, 64 participants searched for enemies (while cued from visual, auditory, tactile, combinations of two, or all three modality cues) and tried to shoot them while avoiding shooting the civilians (fratricide) for two 2-minute low-workload scenarios, and two 2-minute high-workload scenarios. The results showed significant benefits of attentional cueing on visual search task performance. These benefits were revealed by improved performance in reaction time and accuracy from the haptic cues alone, auditory cues alone, and the combination of the visual and haptic cues together. Fratricide occurrence was shown to be amplified by the presence of the audio cues. The two levels of workload produced differences within individual's task performance for accuracy and reaction time. Accuracy and reaction time were significantly better with the medium cues than all the other cue specificities.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA475115>

TR 1216

Conceptualizing Multicultural Perspective Taking Skills. (2007). Rentsch, J.R., Gunderson, A., Goodwin, G.F., & Abbe, A. (DTIC No. ADA475106).

U. S. Army leaders are increasingly required to engage in full-spectrum operations that include a multinational or multicultural component. Army leaders must develop cultural understanding and skills in order to work effectively in multinational alliances, to anticipate and respond to adversary intent, and to interact successfully with local populations. The ability to take the perspective of individuals within the context of their culture enables Army leaders to understand other cultures at a level finer than that afforded by simply using global cultural dimensions alone. Perspective taking is a skill that may play a role in working effectively with diverse individuals across cultural boundaries. Individual level perspective taking is a cognitive process by which an individual is able to identify the thoughts and/or feelings of another. The competencies identified as contributing to multicultural perspective taking include fundamental competencies of self-awareness, personal and interpersonal skills, and regional expertise, and advanced competencies of extraction, interpretation, and a schema for culture. This paper describes a conceptual framework for multicultural perspective taking skills and makes recommendations for training those skills.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA475106>

TR 1217

Understanding Aspects of Individual and Collaborative Skill Acquisition in Face-to-Face and Distance Training Situations. (2007). Lee, A.Y., Gillan, D.J., & Cooke, N. (DTIC No. ADA475102).

Programmatic learning and transfer studies were conducted in co-located and distributed contexts to investigate team-level acquisition of knowledge, use of communication, and establishment and maintenance of trust in complex simulations of military tasks. In these studies, team training occurred in co-located or in distributed contexts, and testing occurred in the same or in an opposite context. Across studies, team performance in distributed contexts was greater than for co-located teams. At initial transfer, all teams showed performance decrements but performance subsequently improved. Results for communication conditions revealed physical context effects at transfer. Results of team-level antecedents to trust, propensity to trust, and trust behaviors indicate that team trust can be built equally well in co-located or in distributed situations if team members are confident in their ability and competence in doing their tasks. Overall, improvements in both training and learning theory are suggested by identifying several variables that affect team performance in context.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA475102>

TR 1218

IkeNet: Social Network Analysis of E-mail Traffic in the Eisenhower Leadership Development Program. (2007). McCulloh, I., Garcia, G., Tardieu, K., MacGibbon, J., Dye, H., Moores, K., Graham, J., Horn, D.B. (DTIC No. ADA475135).

Social network analysis (SNA) has become an important analytic tool for analyzing terrorist networks, friendly command and control structures, and a wide variety of other applications. In this project we collect social network data from a group of 24 Army officers in a one-year graduate program at Columbia University. In this report we discuss methodological issues associated with collecting e-mail social networks and include source code for an add-in to Microsoft Outlook to aid in this process. These data were investigated for patterns and trends in mutual, asymmetric, and null dyads. Behavioral changes in the group resulting from awareness of one's position in social network were also studied. Additionally, comparisons were made between SNA data derived from e-mail traffic and from questionnaires. The differences between these two types of networks are important concerns when considering the implementation of SNA as a command and control tool for friendly forces.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA475135>

TR 1219 — Cancelled

TR 1220

Training for Efficient, Durable, and Flexible Performance in the Military. (2008). Healy, A.F., Wohldmann, E.L., Kole, J.A., Schneider, V.I., Shea, K.M., & Bourne, L.E. (DTIC No. ADA477325).

To optimize performance in the military, training should be efficient, durable, and flexible. Efficiency is essential because of the high costs of training. Military training also must be durable to ensure long-term retention of the trained knowledge and skills for later success in the field. But durable training will be insufficient if the learned knowledge and skills cannot be applied to situations different from those encountered during training. Because training can rarely capture the full set of circumstances under which tasks are subsequently encountered, another important goal for training is transfer or flexibility. Five separate lines of research contribute to this report. The first three demonstrate a high degree of specificity of learning. The authors identified certain circumstances that lead to remarkable durability of what has been learned, yet these same conditions yield very poor flexibility, or the ability to generalize learning to new situations or contexts. Empirical findings are presented illustrating specificity and summarizing their theoretical explanations for the particular tasks they investigated. They propose a general theoretical framework that can account for the high degree of specificity obtained in these studies and that also enables them to predict when learning will be generalizable rather than specific. In addition, in support of their theoretical framework, results from two other lines of research are summarized demonstrating situations showing robust transfer of learning. The results from all five lines of research summarized here support the working hypothesis that there is specificity (limited transfer) for tasks based primarily on procedural information, or skill, whereas there is generality (robust transfer) for tasks based primarily on declarative information, or facts. Thus, these studies provide evidence that for skill learning, retention is high but transfer is low; for fact learning, retention is low but transfer is high.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA477325>

TR 1221

Comprehension and Memory of Spatial and Temporal Event Components. (2008). Radvansky, G.A. (DTIC No. ADA477195).

Across three experiment series, we assessed how people update mental representations of events (called situation models). The first series decomposed spatial and temporal updating with people reading texts. These components involved (a) processing shift signals, (b) establishing new frameworks, (c) maintaining relevant objects, and (d) removing irrelevant objects. We observed component independence. The second and third series assessed cognition as people moved through virtual spaces. In the second series, we found that information about objects was less accessible when there was a spatial shift, particularly for objects the person was currently carrying. This suggests that people operating in complex environments, such as urban battlegrounds, can be negatively affected by the structure of those environments and their interaction with them. For the third series, people first memorized a map of a building. Then they navigated a virtual simulation of the building and were probed with object name pairs. We observed that memory for objects in a person's current location was more available. Second, memory for objects along pathways, that a person passed through but did not interact with, was suppressed. These findings suggest that some prior knowledge of environments may actually be less available by the very act of navigating that space.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA477195>

TR 1222

Development of a Test Battery to Assess Mental Flexibility Based on Sternberg's Theory of Successful Intelligence. (2008). Matthew, C.T., Beckman, J.F., & Sternberg, R.J. (DTIC No. ADA477193).

A test battery to assess mental flexibility was developed based on Sternberg's theory successful intelligence (1985). New mental flexibility assessment instruments were developed and underwent formative and summative evaluation. The newly developed mental flexibility tests showed adequate reliability, and preliminary evidence of construct- and criterion-related validity. One mental flexibility factor explained 70% of variance in the test battery and was differentiated from the latent factor underlying divergent and convergent measures of fluid intelligence. Preliminary evidence of incremental criterion-related validity was found, suggesting that the mental flexibility test battery explains variance above and beyond divergent and convergent measures of fluid intelligence in criterion measures.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA477193>

TR 1223

Automated Feedback and Situation Awareness in Net-Centric C³. (2008). Barnett, J.S., & Ross, J.M. (DTIC No. ADA478164).

The goal of net-centric warfare (NCW) is to give Soldiers an information advantage that leads to a war-fighting advantage. However, NCW systems are quite complex and dynamic, characteristics which can lead to impaired situation awareness (SA) and increased mental workload. It has been suggested that an automated alerting system would help Soldiers focus their attention on mission critical events. This series of experiments investigated how automated audio-visual alerts affect user SA and perceived workload. Two similar experiments were conducted. In each experiment, participants viewed a simulation of a net-centric system, the Force XXI Battle Command Brigade and Below (FBCB2), which included an automated alerting system. SA and workload were measured both with the alerting system enabled and disabled. In the second study, the difficulty of the monitoring task was increased and the automated alerts included a pop-up pictorial representation of the critical event. Results indicate that automated alerting systems do not improve user SA, but they also do not impair user SA. However, mental workload was significantly lower when alerts were enabled. These results can be used to aid decisions about whether or not to include automated alerts in NCW systems.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA478164>

TR 1224

Future Oriented Experimental Army Enlisted Personnel Selection and Classification Project Select²¹ Summary Report. (2008). Knapp, D.J., Tremble, T.R., Russell, T.L., & Sellman, W.S. (DTIC No. ADA478167).

New Predictors for Selecting and Assigning Future Force Soldiers (Select21) is concerned with Soldier accession and personnel classification. The Select21 goal was to ensure the Army acquires Soldiers with the knowledge, skills, and attributes (KSAs) needed for performing well and fitting well in a transformed Army. The objectives of the project were to (a) identify future job demands and the pre-enlistment KSAs required to meet them, (b) develop measures of job performance and critical KSAs, and (c) validate the experimental predictor measures using a concurrent criterion-related paradigm. The predictor set included measures of cognitive ability, temperament, psychomotor skills, values, expectations, and experience. Performance criteria included rating scales completed by supervisors and peers, technical knowledge tests, a situational judgement test, and indicators of person-environment fit (e.g., job satisfaction). Analyses indicated that scores from the Armed Services Vocational Aptitude Battery (ASVAB) predicted both current and future performance (as assessed by future-oriented rating scales) and that the experimental predictors provided incremental validity, particularly in regard to attitudinal criteria. The present report summarizes the Select21 research at a high, relatively non-technical, level and discusses issues associated with further study and implementation of new measures.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA478167>

TR 1225

A Valid Culture Fair Test of Intelligence. (2008). Fagan, J.F. (DTIC No. ADA479963).

The question the present research addressed was whether a racially unbiased test of the ability to process information would predict how well young adults succeed in college classes. The technical barrier overcome was that current theories of intelligence are based on an assumption that all those taking IQ tests have had equal opportunity for exposure to the information being tested. Thus, past efforts to develop an intelligence test that is culture-fair have not been successful. The significance of the research is that it provides further evidence to evaluate a theory that defines intelligence as information processing ability (Fagan, 1992, 2000). Current research on a theory of intelligence as information processing finds racial differences in IQ to be due to cultural factors. A test of information processing is the first valid, culture-fair test of intelligence.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA479963>

TR 1226

Learning the Lessons of Leadership: Case Method Teaching with Interactive, Computer Based Tools and Film Based Cases. (2008). Hill, R.W., Kim, J.M., Zbylut, M.L., Gordon, A.S., Ward, J.N., & Vowels, C.L. (DTIC No. ADA479983).

The Army Excellence in Leadership (AXL) system is an online interactive system for delivering multimedia case method instruction. The intent of the AXL system is to develop leaders with greater

interpersonal competence and cultural awareness. To achieve this goal, the AXL research program combines the case method of instruction with Hollywood techniques and interactive online technology. This report describes the technological capabilities of the AXL system, as well as the case method pedagogy underlying the AXL approach. The report describes how the AXL system capitalizes on the best practices of traditional case method instruction and addresses some of the limitations of case method instruction. Additionally, this report outlines how the instructional content in the AXL system relates to the leadership competencies outlined in Army leadership doctrine (FM 6-22) and the tacit knowledge framework for military leaders developed by Sternberg et al. (2000).
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA479983>

TR 1227

Formative Evaluation of a Massively Multi-Player Persistent Environment for Asymmetric Warfare Exercises. (2008). Singer, M.J., Long, R., Stahl, J., & Kusumoto, L. (DTIC No. ADA480016).

The U.S. Army RDECOM-STTC conducted research on distributed, multi-player simulations for training dismounted Soldier tasks. They requested U.S. Army Research Institute support formative evaluations by supporting briefings, demonstrations, and collecting usability information during exercises. Two usability exercises addressed a standard checkpoint scenario, a third evaluation was conducted during an Army Post Emergency Operations exercise, and a final evaluation supported a pre-deployment Battalion Staff exercise. During evaluation and development, changes were made to the voice system, Semi-Automated Forces (OneSAF) were added, and simulated radio networks were implemented. Added functionality enabled Soldiers to conduct standard Army tasks and trainers to insert threats and conduct AARs. The Soldiers' indicated that working with a simulated three dimensional environment dramatically changed their approach to the mission. Conducting rehearsals within a low-fidelity simulation was considered an enhancement to the training value of field exercises. The gathered opinion-based information indicates that the system can prepare troops for more expensive live drills and actual deployment; integrating basic Warrior skills with reinforced situational awareness, decision making, and asymmetric warfare skills. The program is continuing with new development by RDECOM-STTC, and ARI is using the AW-VTT to research challenges in the use of distributed, game-based simulations for training Soldiers.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA480016>

TR 1228

Leadership: Enhancing Team Adaptability in Dynamic Settings. (2008). Klein, K.J., & Kozlowski, S.W. (DTIC No. ADA493546).

To perform complex, interdependent, and urgent tasks in uncertain, unfamiliar, and often treacherous environments, the U.S. Army must be responsive, agile, versatile, and sustainable. These are the hallmarks of adaptive team performance—the ability of team members to individually and cooperatively apply their knowledge and skills to the resolution of urgent, complex, novel, and ambiguous problems in dynamic work settings. Theory and research regarding the individual, team, and leader processes and characteristics that foster adaptive team performance are, unfortunately, quite limited. We conducted five interrelated research projects, combining research methods and approaches—including comprehensive foundational literature reviews, theory development, experimental research in a laboratory setting, qualitative case study research, and longitudinal survey research in the field—to build new understanding of the ways in which leaders may enhance team learning, coordination, and adaptive performance in dynamic work environments.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA493546>

TR 1229

Training to Operate a Simulated Micro-Unmanned Aerial Vehicle with Continuous or Discrete Manual Control. (2008). Durlach, P.J., Neumann, J.L., & Billings, D.R. (DTIC No. ADA482410).

This report investigates the effects of continuous vs. discrete control methods and the number of simultaneous camera views on operator performance during training to manually control a simulated micro-unmanned aerial vehicle (MAV). Seventy-two participants were trained to operate a MAV in a simulated environment, to designated criterion levels. They were then given training missions during which performance was measured. Eight conditions were investigated, formed by crossing three 2-level factors: input device (mouse vs. game controller), input control display (discrete vs. continuous), and number of simultaneous camera views (one vs. two). Superior performance was observed when a continuous input method (e.g., multiple degrees of freedom) was provided for continuous MAV functions (e.g. maneuvering in space) and a discrete input method (e.g., single action) was provided for discrete

MAV functions (e.g., command to hover). Under these conditions, mission times were shorter, collisions were fewer, and more targets were photographed. Effects of video game experience and spatial ability were also investigated. Recommendations for the design of unmanned vehicle controls were discussed. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA482410>

TR 1230

The Perception and Estimation of Egocentric Distance in Real and Augmented Reality Environments. (2008). Jerome, C.J., & Witmer, B.G. (DTIC No. ADA493544).

Previous research using verbal judgements of distance have shown distances tend to be underestimated. The extent to which distances are underestimated is greater with virtual environments than with real world environments. The goal of the current experiment was to test the difference in the perception of distance to real and virtual objects using verbal estimation and manual replication. Recent empirical studies are providing data on human interactions with augmented reality technology that are essential for determining the usefulness of current augmented reality (AR) for training and performance enhancement. The equipment used in this research included hardware and software for presenting virtual objects in an AR environment, and the participants were 32 college students. Replication procedure significantly improves the estimation of the previously viewed object distance. Distance estimates to real objects in a real environment were significantly better than they were to virtual objects in an augmented environment. These results lend further support to the notion that verbal estimates of distance do not accurately represent perceived distance. Unless the task being performed specifically requires a numerical estimate of distance, it is recommended that methods similar to our distance replication method be used to accurately determine perceived distance.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA493544>

TR 1231

Net-Centric C³ Skills: Soldiers' Views on a Skill Taxonomy and Training Challenges. (2009). Barnett, J.S., & Ross, J.M. (DTIC No. ADB347292 / Restricted).

TR 1232

The Effects of Seductive Details on Recognition Tests and Transfer Tasks. (2008). Towler, A., & Kraiger K. (DTIC No. ADA483155).

This research focuses on the investigation of pre-training and in-training events that facilitate effective learning and the transfer of knowledge and skills acquired through distributed learning. We tested training effectiveness principles in the context of suboptimal learning. Specifically, we investigated the seductive details phenomenon, a condition in which the inclusion of interesting information irrelevant to the training objectives reduces trainee learning. In terms of our findings, we found no effect of seductive details on recall tests in the experiments. This finding is contrary to much of the previous research that has found that providing seductive details distracts trainees from learning and results in lower scores on recall tests than those who are not exposed to seductive details. However, we did find support for our proposition that inclusion of seductive details benefits transfer performance. These findings suggest that to enhance transfer, distributed learning designers should incorporate interesting yet tangential features into the technology.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA483155>

TR 1233

Performance Appraisal Feedback: A Foundation for Effective Self Development. (2008). Orvis, K.A. (DTIC No. ADA483157).

The U.S. Army's Leader Development Program relies on three development methods: institutional training and education, operational assignments, and self-development. The value of a self-development as a means for employee development has also been recognized in the private sector as well as in other public organizations. Unfortunately, empirically-based evidence concerning how the Army (and other organizations) can support and enhance employee self-development efforts is far from comprehensive. Prior research examining self-development in the public and private sector has focused on factors that stimulate the quantity of self-development participation. Yet, meaningful development in an individual's job knowledge and skills is contingent on the quality of self-development activities in which one participates, not simply the quantity of self-development. The present study developed and tested a model of the effects of supervisory performance appraisal feedback on the quality of employees' self-development choices. Data collected generally supported the model. Results suggest that supervisory feedback shapes the quality of an employee's subsequent self-development choices both directly and

indirectly through its influence on employee self-regulation. Furthermore, results suggest that the attributes of feedback combine both additively and multiplicatively to influence self-regulation. Implications for fostering self-development in the Army are discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA483157>

TR 1234

Effects of Input Device and Latency on Performance While Training to Pilot a Simulated Micro-Unmanned Aerial Vehicle. (2008). Durlach, P.J., & Billings, D.R. (DTIC No. ADA493588).

The effects of input device and latency in training to manually pilot a simulated micro-aerial vehicle (MAV) were investigated. Our prior research suggested that performance was superior when using a game controller as opposed to a mouse during missions in which maneuvering skill and attention to sensory imagery were critical. This experiment investigated whether effects would persist when participants were tested in a novel environment and when some realistic latency was imposed between input command and MAV response. Fifty-six participants were trained to operate a MAV in one simulated environment and then tested with two new missions in a novel environment. Four between-group conditions were examined, formed by crossing two 2-level factors: input device (game controller vs. mouse) and latency period (no time delay vs. 500 ms delay). The effects of input device replicated our prior research and also transferred to the novel environment, suggesting that input device rather than spatial learning was responsible for the differences in performance. No substantial effects of delay were found. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA493588>

TR 1235

Change Detection in Social Networks. (2008). McCulloh, I., Webb, M., Graham, J., Carley, K.M., & Horn, D.B. (DTIC No. ADA484611).

Social network analysis (SNA) has become an important analytic tool for analyzing terrorist networks, friendly command and control structures, and a wide variety of other applications. This project proposes a new method for detecting change in social networks over time, by applying a cumulative sum statistical process control statistic to normally distributed network measures. The proposed method is able to detect organizational change in the same manner as a quality engineer can detect a change in a manufacturing process. The new algorithm is demonstrated on social network data collected on a group of 24 Army officers going through a 1-year graduate program at Columbia University and on al-Qaeda leading up to and immediately following the terrorist attacks of 11, 2001.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA484611>

TR 1236

Modeling the Direct and Indirect Determinants of Different Types of Individual Job Performance. (2008). Johnson, J.W., Duehr, E.E., Hezlett, S.A., Muros, J.P., & Ferstl, K.L. (DTIC No. ADA484640).

Despite the importance of citizenship performance and adaptive performance to Army junior commissioned officer job performance, there has been very little published research studying these constructs in a military setting and there is no well-established model of the process by which individual differences predict citizenship or adaptive performance. The purpose of this research was to test a model of the process through which individual difference variables work to influence performance on specific performance dimensions. To test this model, we assembled and developed a battery of instruments that are construct-valid measures of each component of the model and administered them to 155 ROTC cadets. Results supported our model with some modifications. Individual differences in ability, personality, and experience influence performance through the mediating variables of knowledge, skill, and three components of motivation (motives, proactive cognitions, and self-regulation). A different model was found to describe the process depending on whether the performance dimension was an element of task, citizenship, or adaptive performance.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA484640>

TR 1237

Evaluating the O*NET Occupational Analysis System for Army Competency Development. (2008). Russell, T.L., Sinclair, A., Erdheim, J., Ingerick, M., Owens, K.S., Peterson, N., & Pearlman, K. (DTIC No. ADA484632).

The present evaluation focused primarily on the usefulness of the O*NET system for Army occupational analysis for selection and classification purposes. The evaluation focused on the appropriateness of O*NET descriptors that would typically be used in an Army occupation analysis for selection and

classification purposes: abilities, skills, generalized work activities [GWAs], and work context. Four civilian and four officer occupations were selected for this research. The objective was to produce data for the military occupations that could be compared to civilian O*NET data. Therefore, it was important to follow processes currently used by O*NET for data collection. In effect, this meant collecting information on occupational tasks, abilities skills, GWAs, and work context from Army Subject Matter Experts (SMEs) and collecting ability and skill ratings using trained analysts. The results showed that Army SMEs as well as other types of analysts could make reliable ratings on the O*NET descriptors. Potential uses for the O*NET descriptors are discussed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA484632>

TR 1238

Nonverbal Communication in the Contemporary Operating Environment. (2009). Yager, M., Strong, B.E., Roan, L., Matsumoto, D., & Metcalf, K.A. (DTIC No. ADA501219).

Nonverbal behavior (NVB) is a key part of communication, arguably accounting for considerably more of the communicative message than that contained in verbal exchanges. This is especially true when a language barrier exists, as it does for many Soldiers stationed overseas. Universal and culture-specific NVB knowledge, skills, and attitudes (propensity) enable Soldiers to better identify opportunities to influence individuals, groups, and situations, especially when seeking cooperation or needing to identify friendly vs. hostile intent. The goal of the training proposed herein is to prepare Soldiers to predict and interpret nonverbal behavior. To develop the training framework, a literature review, a preliminary emblem extraction effort, and SME interviews and surveys were conducted. Competencies identified in NVB training include relevant attention and observation skills; cognitive processes to baseline people and scenes to develop expectancies of normative states and detect changes to a baseline; and knowledge of NVB functions and cues relevant to specific applications such as aggression and deception detection. This report describes a conceptual framework for teaching specific NVB concepts and cues designed to provide maximum benefit to Soldiers and makes specific recommendations about how such a curriculum may be taught.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA501219>

TR 1239

Navigating the Human Terrain: Development of Cross-Cultural Perspective Taking Skills.

(2009). Rosenthal, D.B., Wadsworth, L.A., Paullin, C., Hooper, A.C., Mathew, J., & Bhawuk, D.P. (DTIC No. ADA501292).

U.S. military missions often require that our troops work effectively with people from different cultures. To do this requires, at all levels of our force structure, an appreciation of the intricacies of societal and tribal cultures and the complexity of human-to-human interactions. This report describes the concept for a culture-general training system that can enhance multicultural perspective taking using two complimentary and integrated components. The first component teaches intercultural knowledge and theory, and the second is a cultural assimilator, which uses a scenario-based approach, short stories describing realistic and challenging interactions between two or more persons from different cultural backgrounds.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA501292>

TR 1240

Assessment of the Captains in Command Training Program for Adaptive Thinking Skills. (2009). Shadrack, S.B., & Fite, J.E. (DTIC No. ADA507445).

Adaptive thinking is a key component of competency in battle command. Unfortunately, expertise in adaptive thinking is not easily acquired and training typically requires the presence of a live instructor. This report presents the first evaluations of Captains in Command, an instructorless program for training adaptive thinking skills in company grade officers. Participants were 36 students enrolled in the Maneuver Captain's Career Course (MCCC) at Fort Knox, Kentucky. Students received instruction on adaptive thinking and themes of battlefield thinking. They then viewed a series of vignettes, which placed them in the role of a company commander faced with complex tactical problems. After each vignette, students were asked to identify the critical tactical information required before a sound decision could be made. Three-dimensional animated characters provided coaching and discussed the relevant information identified by expert tacticians. With Captains in Command training, students showed significant improvements in their ability to identify critical information. They were also able to identify significantly more information than untrained students regardless of prior deployment experience. When the efficacy of instructorless Captains in Command training was compared to

instructor-facilitated Think Like a Commander (TLAC) training, there were no significant differences in students' performance at the end of the program.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507445>

TR 1241

Selection for Accelerated Basic Combat Training. (2009). Hoffman, R.R.III., Heffner, T.S., Muraca, S.T., Hendricks, R. & Hunter, A.E. (2009). (DTIC No. ADA494811).

The U.S. Army asked the U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) to develop a tool to select qualified candidates for an accelerated Basic Combat Training (BCT) track. The tool was to incorporate non-cognitive measures to provide broader measurement than an existing procedure which relied on a cognitive test and a physical fitness test. The tool was developed over two phases, a development phase and a validation phase. The results suggested that non-cognitive assessment can contribute to the identification of the most well prepared Soldiers for a more challenging training regimen. However, the results were not sufficiently consistent across the two phases to suggest a stable model for identifying such Soldiers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA494811>

TR 1242

Assessing Professional Competence by Using Occupational Judgement Tests Derived From Job Analysis Questionnaires. (2009). Legree, P.J., Psotka, J., Bludau, T.M., & Gray, D. M. (DTIC No. ADA494988).

Based on the historical success of job analysis questionnaires and the related expectation that respondents with technical expertise are required to obtain valid job analysis ratings data, we hypothesized that these questionnaires can be converted into judgement tests to measure individual differences in occupational expertise. As an initial test of this hypothesis, Occupational Judgement Tests (OJTs) were derived from job analysis questionnaires, and job incumbents were asked to objectively rate the frequency of job tasks and the importance of employee attributes to occupational performance. The OJTs required 3 minutes to complete, were administered to 302 job incumbents from four diverse occupations, and were scored using consensually derived standards and through factor analysis. As hypothesized, OJT consensus-based scores were valid against measures of incumbent job knowledge ($p = .34$ to $.35$), cognitive aptitude ($p = .17$ to $.25$), and career attitudes ($p = .19$). OJT factor scores were valid against career attitudes ($r = .21$ to $.29$). This method provides broadly sensitive and inexpensive measures of job competence that could expand the predictor and criterion space in personnel selection studies for many occupations.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA494988>

TR 1243

Temporal Investigations into the Relationship between Affect and Discretionary Work Behavior. (2008). Weiss, H.M., Dalal, R.S., Lam, H., & Welch, E.R. (DTIC No. ADA508304).

After a long hiatus, mood and emotions (collectively known as "affect") are enjoying a strong resurgence in many areas of psychology. Vis-à-vis the workplace, Affective Events Theory predicts that stochastic workplace events influence workplace affect, which in turn influences various workplace behaviors relevant to job performance. Moreover, like the events and affect that precede them, these behaviors are highly volatile within persons over time. The present set of research projects were designed to test, and extend, Affective Events Theory. The research focuses on the "contextual" or "discretionary" aspects of job performance—namely, organizational citizenship behavior and counterproductive (deviant) work behavior. These behaviors, typically studied at the between-person level, were shown in the present research to be highly volatile within persons over time and reliably related to affect. Moreover, within persons, citizenship and counterproductive behavior were themselves virtually unrelated. Finally, experiencing a common form of counterproductive behavior was associated with enacting similar behavior as well as other forms of counterproductive behavior. The results are relevant to the Army's continued search for the "good Soldier": one who engages in citizenship behavior and refrains from counterproductive/deviant behavior.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA508304>

TR 1244

Investigations into Army Enlisted Classification Systems: Concurrent Validation Report. (2009). Ingerick, M., Diaz, T.E., & Putka, D.J. (DTIC No. ADA500985).

The Army faces a number of personnel needs as it transforms to meet the challenges of today and the near future. To meet these challenges, the Army is seeking recommendations on predictor measures, in particular measures of non-cognitive attributes (e.g., interests, values, and temperament), that could be administered to enhance Soldier selection and classification decisions. The U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) conducted a Concurrent Validation (CV) research effort to advance this objective. The objectives of this research were twofold: (a) to examine the value of using new, experimental predictor measures to select recruits into the Army; and (b) to investigate the potential of new, experimental predictor measures to enhance the classification of recruits into entry-level jobs. Criterion measures and experimental predictors were administered to 424 first-term Active Army Soldiers representing five military occupational specialties (MOS): (a) 11B Infantryman, (b) 19K Armor Crewman, (c) 25U Signal Support Systems Specialist, (d) 63B Light Wheeled Vehicle Mechanic, and (e) 68W Health Care Specialist. The value of the experimental predictor measures to enhance recruit selection and classification were examined. Overall, the results indicate that the experimental predictors show potential to increment the existing Armed Services Vocational Aptitude Battery (ASVAB) for the purposes of selecting recruits into the Army and classifying them into entry-level jobs.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA500985>

TR 1245

Anytime, Anywhere Terrain Visualization Training System: Combining Training Theory and Technology to Train Human Computer Visualization. (2009). Rossi, M.J., Khan, M.J., Nanda, S., Lickteig, C.W., & Schaefer, P.S. (DTIC No. ADM002200 / DVD).

This report describes the design and evaluation of a new system for training terrain visualization, an important but difficult skill to train and acquire. Recognizing the inherent limitations of traditional paper-and-pencil methods of training terrain visualization, the U.S. Army awarded a Small Business Technology Transfer (STTR) contract to combine training theory and technology to improve terrain visualization training. The prototype training system (Anytime, Anywhere Terrain Visualization Training, or A2TV) allows trainees to interactively view and vary digital representations of terrain by flying and driving through terrain, morphing terrain, and overlaying contour information. In two experiments with novices, one or more of the training methods was shown to significantly improve important terrain visualization skills. Terrain visualization performance was also correlated with spatial ability measures. A training potential and usability evaluation was conducted with active duty military personnel. Military participants affirmed the need for training terrain visualization, acclaimed the potential of the A2TV system for training as well as mission planning and support, and provided constructive recommendations on refinements needed for Phase III commercialization.

TR 1246

Augmented Performance Environment for Enhancing Interagency Coordination in Stability, Security, Transition, and Reconstruction Operations. (2009). Cianciolo, A.T., LaVoie, N., Foltz, P., & Pierce, L.G. (DTIC No. ADA499528).

Stability, security, transition, and reconstruction (SSTR) operations are a core U.S. military mission (United States Department of Defense, 2005). The objective of these missions is to help establish order with the aim of attaining a sustainable peace while advancing U.S. interests. To conduct SSTR operations, U.S. military forces work with a host of partners representing non-governmental aid organizations and other U.S. government agencies, as well as international agencies and multinational military forces. These partners may share an overarching goal, but differ significantly in how the goal or goals should be achieved. The purpose of this effort was to investigate the implications of organizational and national culture on SSTR operations and to define requirements for performance support and training. With a focus on the provincial reconstruction team (PRT), we specified cultural identities (beyond nationality) that influence interagency operations, used consensus-building as a metaphor for understanding SSTR planning, and linked cultural differences to SSTR planning tasks and collective skill breakdowns. A prototype, automated system to enhance interagency collective performance in SSTR operations was demonstrated. The system integrated latent semantic analysis with cultural reference materials, readiness assessments, rehearsal opportunities and individual skill development exercises.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA499528>

TR 1247 — Cancelled**TR 1248**

The Human Dimension of Advising: An Analysis of Interpersonal, Linguistic, Cultural, and Advisory Aspects of the Advisor Role. (2009). Zbylut, M.L., Metcalf, K.A., McGowan, B., Beemer, M., Brunner, J.M., & Vowels, C.L. (DTIC No. ADA507713).

A survey targeting interpersonal, cultural, language, and advisory activities was administered to 565 Army and Marine advisors returning from Iraq and Afghanistan. Advisors rated how frequently they engaged in 151 activities, as well as indicated how important those activities were to advisor performance. Results indicated that the most frequent activity engaged in by advisors was communicating through an interpreter, followed by role modeling behaviors and behaviors demonstrating consideration and respect. Results suggest that advisors did not view language proficiency as necessary to perform their job, but that knowledge of common words and greetings in the host nation language is important. Results also highlight the importance of impression management skills, skill at interpreting nonverbal behavior, mentoring and coaching skills, the ability to compare one's culture with the counterpart's culture, the ability to detect manipulation, rapport building, and interacting with coalition forces.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507713>

TR 1249

Team Composition Optimization: The Team Optimal Profile System. (2009). Donsbach, J.S., Tannenbaum S.I., Alliger, G.M., Mathieu, J.E., Salas, E., Goodwin, G.F., & Metcalf, K.A. (DTIC No. ADA501355).

Teams have become strategic features in organizations. Research and practice suggest team effectiveness is driven considerably by the mix of team member attributes. Given the impact a team's composition has on its objectives, private industry and military leaders place a premium on making optimal team staffing decisions. Nonetheless, the challenges associated with achieving optimal team composition are significant and indicate a need for a tool/system to help commanders optimize personnel allocation. Accordingly, this report lays the foundation for a system that incorporates the elements required to help leaders optimize team composition. For our first task, leaders with extensive team staffing experience were interviewed to uncover the implicit decision models used by team staffing experts. Supplementing extant research, the interviews contributed to our second task: the development of a team composition decision taxonomy. The taxonomy defines and organizes elements of the team staffing decision domain. The interviews and taxonomy culminated in the development of a generic, customizable team composition optimization algorithm that models team composition-effectiveness relationships. Finally, we designed a framework/methodology for a Team Optimal Profiling System (TOPS) and demonstrated its use for making an optimal team composition decision.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA501355>

TR 1250

The Leader AZIMUTH Check: Factor Structure of Common Competencies. (2009). Steele, J.P., & Garven, S. (DTIC No. ADA501598).

Enhancing the leadership skills of Soldiers is of primary importance to the U. S. Army. A critical step in the process of leader development is self-awareness through self-assessment. Such insight is important because identifying and assessing trainable competencies that facilitate maximum leadership effectiveness creates a strategic advantage. This report describes the psychometric properties and common competencies assessed by the Leader AZIMUTH Check, a 360-degree feedback instrument for Army leaders. The AZIMUTH was designed and implemented by the Army Research Institute (ARI) to improve leader common competency development, leader- directed feedback, and enhance leader self-awareness. The purposes of the present research project were to establish a factor structure of common competencies, the minimum number of raters required for adequate reliability, conceptual agreement across rating sources, rating patterns and behaviors, and validity evidence of the AZIMUTH.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA501598>

TR 1251

Identifying the Core Content and Structure of a Schema for Cultural Understanding. (2009). Rentsch, J.R., Mot, I., & Abbe, A. (DTIC No. ADA501597).

Multicultural perspective taking skills enable Army leaders to adapt quickly when encountering individuals or groups from unfamiliar cultures and function effectively in multinational alliances. In previous research, a schema for cultural understanding was identified as a key component of multicultural perspective taking. The primary objective for the present research was to identify core content and structure of a schema for cultural understanding that can be used to inform training for Soldiers deploying to unfamiliar cultures. Using a combination of qualitative and quantitative methods, we extracted schema content through interviews and identified common themes and concepts. This process resulted in schema content consisting of attributes of culture, goals in using cultural knowledge, and tactics for cultural learning. Findings indicated that concepts of religion, values and beliefs, and customs or traditions were central attributes of cultural understanding. These findings can inform training development and guide further research on the skills needed to function effectively in multicultural environments. Whereas traditional cultural awareness training typically focuses on understanding members of a specific culture or country, augmenting this training by focusing on a schema for cultural understanding developed through practical experience will afford Army leaders broader cultural capability.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA501597>

TR 1252

Operational Assessment of Tools for Accelerating Leader Development. Volume 1: Capstone Report. (2009). Leibrecht, B.C., McGilvray, D.H., Tystad, D.L., & Garven, S. (DTIC No. ADA507714).

This report, in two volumes, describes the operational demonstration and assessment of an innovative toolkit resulting from a research program aimed at enhancing self-development of junior leaders in the Army. The toolkit contains online diagnostic and training tools that build self-awareness, metacognitive abilities, critical thinking skills, and interpersonal skills. Soldiers in units and user juries provided feedback on the tools. The pressures of the operational environment seriously limited the time available to work with the tools. The user satisfaction results indicated the toolkit provides a reasonable mix of capabilities, but completeness remains an open question. The tools appear to be especially suitable for use in pre-commissioning and military education programs. They offer moderately favorable acceptability, learning effectiveness, and value. However, the online learning methods may need modification to accommodate the importance Army leaders place on interpersonal interaction with mentors and peers. The findings, lessons learned, and recommendations can help decision makers, program architects, training developers, and research investigators advance the state of the art for leadership development programs. Volume II, ARI Research Note 2009-09, presents the report's appendices.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507714>

TR 1253

DARPA Automated Competence Assessment and Alarms for Teams. (2009). Foltz, P. (DTIC No. ADB353804 / Restricted).

TR 1254 — Cancelled

TR 1255 — Replaced by TR 1264

TR 1256

Leader and Team Adaptation: The Influence and Development of Key Attributes and Processes. (2009). Zaccaro, S.J., Banks, D., Kiechel-Koles, L., Kemp, C., & Bader, P. (DTIC No. ADA507989).

This report summarizes the results of a series of investigations that examined (a) the role of feedback processes as a leadership tool in team adaptation, (b) the influence of developmental work experiences on team and leader adaptability, and (c) the effects of combinations of leader qualities on the display of adaptation processes and performance in dynamic military and business settings. The results of these investigations indicated that (a) process-oriented, team level, and public feedback from leaders was most effective in facilitating team adaptation, particularly when team members possess high levels of cognitive skills; (b) developmental assignments are associated with growth in social competencies, but only when participating leaders have high levels of metacognitive skill, cognitive complexity, and tolerance for ambiguity; (c) social competencies influence leader adaptability.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507989>

TR 1257

Validating Future Force Performance Measures (Army Class): End of Training Longitudinal Validation. (2009). Knapp, D.J., & Heffner, T.S. (DTIC No. ADA507669).

The Army needs the best personnel to meet the emerging demands of the 21st century. Accordingly, the Army is seeking recommendations on new experimental predictor measures that could enhance entry-level Soldier selection and classification decisions, in particular, measures of non-cognitive attributes (e.g., interests, values, temperament). The U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) is conducting a longitudinal criterion-related validation research effort to collect data to inform these recommendations. Data on experimental predictors were collected from about 11,000 Soldiers. Training criterion data were collected for differing subsets of the predictor sample in the first of three planned criterion measurement points. Soldiers were drawn from two samples: (a) job-specific samples targeting six entry-level Military Occupational Specialties (MOS) and (b) an Army-wide sample with no MOS-specific requirements. In the analyses reported here, the value of the experimental predictor measures to enhance new Soldier selection was examined. Overall, many of the experimental predictors significantly incremented the Armed Forces Qualification Test (AFQT) in predicting Soldier performance and retention during training. In addition, the experimental predictors generally exhibited smaller subgroup mean differences (by gender, race, and ethnicity) than the AFQT.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507669>

TR 1258

Social Awareness and Leader Influence: Development of Classroom and Web-Based Learning Interventions. (2009). Mueller-Hanson, R.A., Swartout, E.C., Nelson, J.K., Parish, C., Martin, C., & McGonigle, T.P. (DTIC No. ADA507832).

This research entailed developing and testing a detailed program of instruction to help Army leaders improve their social awareness and influence skills. Based on input from Soldier subject matter experts and the behavioral sciences literature, two training programs were developed: a six-hour classroom course and a parallel web-based course. Additionally, four assessments were created: a Social Awareness and Influence Skills Self-assessment to assess self-perceptions of skills, a knowledge test to assess learning in the course, a situational judgement test (SJT) to assess the students' ability to apply social insight and judgement to interpersonal situations, and a web-based role-play to assess the students' ability to apply influence tactics. These courses and assessments were then subsequently tested in two pilot samples. Results of the participant reactions questionnaire indicated that the training programs in both the classroom and web-based formats were well received by the target audience and that participants gained new knowledge as a result of the course. Results also indicated promise for the measures piloted in this project. The outcomes of this effort include a fully developed classroom-based POI and a companion prototype web-based POI that are suitable for first-line Army leaders (E4 to E6 and O1 to O3).

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507832>

TR 1259

Social Perspective Taking. (2009). Roan, L., Strong, B.E., Foss, P., Yager, M., Gehlbach, H., & Metcalf, K.A. (DTIC No. ADA509341).

The current mindset of the Army is that it must be able to win our Nation's wars while at the same time ready to assist in stability operations (U.S. Department of the Army, 2008). A challenge is that Soldiers often have to bridge large cultural gaps and may lack the language skills to effectively engage with the host of individuals now present in these operations including the local populace, host nation security forces, coalition partners and other foreign governmental and nongovernmental agencies. Perspective taking – described more formally as “Social Perspective Taking” (SPT) – is an interpersonal technique which may address these challenges. SPT is a skill often learned throughout life but may be very difficult in cross-cultural interactions. This report describes the results of a literature review and SME and Soldier interviews regarding the knowledge, skills, and abilities (KSAs) needed to develop SPT and the methods used to train SPT. Based on this information a four module curriculum is proposed which utilizes a four-step method for the development of SPT. The curriculum trains Soldiers how to accurately consider the host-national's perspective without cultural bias and erroneous assumptions and allows Soldiers to meet host-national goals while accomplishing U.S. missions and objectives.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA509341>

TR 1260

Locus of Control, Risk Orientation, and Decision Making Among U.S. Army Aviators. (2009). Hunter, D.R., & Stewart, J.E. (DTIC No. ADA509824).

This report was developed under the Small Business Innovative Research Program Phase I. The goal of the research was to develop a set of web-based prototype scales that would assess hazardous events, locus of control, safety-related attitudes, and risk orientation among U.S. Army Aviators. New measurement scales with an Army focus were developed that were modeled after civilian scales. These scales were: Army Hazardous Events Scale, Army Locus of Control Scale, Army Safety Attitudes Scale, and Army Aviation Scenarios Scale. In four surveys the scales were administered to samples of Army Aviators and their responses were used to conduct a preliminary evaluation of the scales. All the scales were found to exhibit good psychometric reliability and several of the sub-scales from the measures were significantly correlated with self-reported accident involvement.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA509824>

TR 1261

Understanding Demonstration Based Training: A Definition, Conceptual Framework, and Some Initial Guidelines. (2009). Salas, E., Rosen, M.A., Pavlas, D., Jensen, R., Fu, D., Ramachandran, S., Hinkelman, E., & Lampton, D.R. (DTIC No. ADA509390).

This research was conducted as part of a Phase I Army Small Business Innovative Research (SBIR) contract monitored by the Army Research Institute for the Behavioral and Social Sciences (ARI). The overall goal of the SBIR topic is to develop a comprehensive system for designing, producing, distributing, and using training demonstrations. This report provides an initial formalism for demonstration-based learning, to be incorporated into the design and development of that system. The report provides a conceptual definition of demonstrations, a framework of demonstration features, and a set of initial guidelines for designing effective demonstrations organized around the presented framework. This serves the dual purposes of organizing what is known about designing effective demonstrations and directing future research.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA509390>

TR 1262

Evaluation of the Virtual Squad Training System. (2010). Lampton, D.R., & Jerome, C.J. (DTIC No. ADA514969).

The Virtual Squad Training System (VSTS) is a network of nine individual immersive simulators with Helmet-Mounted Displays (HMDs), and a command station for controlling computer generated entities. The VSTS includes both tethered and wearable simulators. The VSTS was evaluated with two squads (9 members per squad) of Soldiers performing selected individual/fire team tasks and squad tactical exercises for dismounted infantry over a four day period (two days per squad). Soldiers rated the system capabilities of 62 specific simulator functions (such as move and shoot) and rated the perceived training effectiveness for 24 tasks such as react to direct and indirect fire. A structured interview addressed various training issues. Frequent technical problems with individual simulators and the network interfered with the conduct of the evaluation and probably affected Soldiers' ratings of the VSTS. Simulator sickness incidence was low compared to previous evaluations of antecedent systems using HMDs.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA514969>

TR 1263 — Cancelled**TR 1264**

Cross-Cultural Strategies for Improving the Teaching, Training, and Mentoring Skills of Military Transition Team Advisors. (2010). O'Connor, A., Roan, L., Cushner, K., & Metcalf, K.A. (DTIC No. ADA507715).

Military doctrine currently provides guidance on various methods to train host-nation security forces (FM3-24); yet U.S. advisors typically have little training in teaching methods, particularly in a cross-cultural environment. This document presents a conceptual framework that identifies individual advisor and counterpart differences, as well as the situational and cultural factors that impact the success and failure of training, coaching, or mentoring. This report includes a comprehensive literature review, data from iterative interviews with host nationals, military transition team members, cross-cultural education experts, educators and trainers from the U.S., Afghanistan, Iraq and the Horn of Africa. It also includes

recommendations which outline innovative methods for training military advisors to more effectively teach and coach their counterparts in a cross-cultural setting. In order to provide effective advising to host nationals, advisors need expertise in two areas: 1) cross-cultural competencies related to teaching and learning and 2) cross-cultural teaching strategies. Key cross-cultural competencies pertinent to the military advisor are identified and include understanding the cross-cultural teaching/advising relationship, culturally relevant curriculum and methods, cross-cultural communication, and effective cross-cultural assessment. The report also includes a discussion of structural barriers to effective advising, and recommendations for developing a cross-cultural teaching and training curriculum for Soldiers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507715>

TR 1265

Human Relations 2009: Initial Military Training Enlisted Soldier Survey Results. (2010). Lappin, M., & Howard, C.R. (DTIC No. ADB361527 / Restricted).

TR 1266

Human Relations 2009: Operational Troops Survey Results. (2010). Lappin, M., & Howard, C.R. (DTIC No. ADB361528 / Restricted).

TR 1267

Expanded Enlistment Eligibility Metrics: Recommendations on a Non-Cognitive Screen for New Soldier Selection. (2010). Knapp, D.J., & Heffner, T.S. (DTIC No. ADA523962).

The Army needs the best personnel available to meet the emerging demands of the 21st century. Accordingly, the Army is seeking recommendations on experimental non-cognitive predictor measures (e.g., interests, values, temperament) that could enhance entry-level Soldier selection and classification decisions. The U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) is conducting a longitudinal criterion-related validation research effort to collect data to inform these recommendations. Experimental predictor measures of individual differences in temperament and job interests were administered at Army Reception Battalions to 8,103 new Soldiers. At the end of training, archival criterion data were collected for 7,599 Soldiers and supplemented with for-research-only criteria for 1,194 Soldiers. The results support the Tailored Adaptive Personality Assessment (TAPAS) and Work Preferences Assessment (WPA) as candidates for a new Soldier screen. Based on these results, the Army has implemented the TAPAS as an operational test for applicants and is pursuing further research on the WPA. An operational test and evaluation (IOT&E) has been initiated to evaluate the new screen.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA523962>

TR 1268

Development and Evaluation of the Officer Transition Survey and Proxy Group. (2010). Lentz, E., Kubisiak, U.C., Legree, P.J., Horgen, K.E., Young, M.C., Smith, T., Dullaghan, T.R., Sauser, J.E., Jackson, E.M., & Tremble, T.R. (DTIC No. ADA523959).

The work described in this report is an extension of the STAY project, with a directed focus on officer career continuance. An Officer Transition Survey (OTS) was developed to identify and examine the factors that influence junior officers to continue serving beyond their ADSO or separate from the Active Army. Career continuance factors and separation motives were identified and documented for 169 Active Army junior officers (O1-O3) who were actively out-processing at Army Transition Centers. Data were also collected from proxy samples that were comprised of 485 junior officers who were in the process of deciding whether to serve beyond their service obligation (officer proxy sample) and 68 experts who work closely with junior officers (expert proxy sample). Results indicated the OTS provides valid, empirical information regarding junior officers' career continuance influences and separation motives. Results also show that officer and expert proxy samples can be used to understand and quantify the motives of officers who are separating from the Active Army. These findings have important implications for collecting valid information using a more efficient, streamlined application of survey methodology that expends fewer resources.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA523959>

TR 1269

Identifying Experts in the Detection of Improvised Explosive Devices. (2010). Murphy, J.S. (DTIC No. ADB361570 / Restricted).

TR 1270 — Replaced by RP 2011-03

TR 1271**Influence of the Officer Retention Resource Website on Attitudes and Retention Intentions.**

(2010). Hezlett, S.A., Johnson, J.W., & Babin, N.E. (DTIC No. ADA531572).

We developed and evaluated a website targeted at influencing key factors previously identified as important to company grade officers' retention decisions. Information collected from a series of focus groups conducted with officers guided the development of the website. We used a pre-test post-test control group design to evaluate the impact of having the opportunity to use the website. Officers in the treatment condition participated in group sessions featuring an orientation to the website. They subsequently had access to the website for about three months. Officers in the control group attended sessions where they participated in a structured group discussion of retention. Officers in both groups completed pre-surveys before the treatment was implemented and were invited to complete follow-up surveys three months later. After controlling for pre-survey scores and variables on which the treatment and control groups initially differed significantly, no statistically significant differences were observed between the control and treatment groups on the follow-up surveys. However, officers in the treatment condition who visited the website after the orientation subsequently had more favorable perceptions of their pay and benefits than those who did not. The limitations of this investigation are discussed. Recommendations for future initiatives to improve retention are made.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA531572>

TR 1272**Scoring Situational Judgment Tests Using Profile Similarity Metrics.** (2010). Legree, P.J., Kilcullen, R.N., Psotka, J., Putka, D.J., & Ginter, R. (DTIC No. ADA530091).

This paper describes the application of profile similarity metrics to score Situational Judgment Tests (SJTs) that utilize rating scales to register examinee responses. The paper presents and discusses mathematical analyses that decompose distance-based measures into component indices based on correlation, dispersion and elevation metrics. The mathematical analyses demonstrate that distance measures represent a mixture of variance that can be associated with these separate components. Comparing the validities of distance and component indices using Leader Knowledge Test (LKT) data supports conclusions that the use of component indices (i.e., correlation, dispersion and elevation scores) improves the validity of SJTs that utilize rating scales.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA530091>

TR 1273**Input Device Characteristics Contribute to Performance during Training to Operate a Simulated Micro-Unmanned Aerial Vehicle.** (2010). Billings, D.R., & Durlach, P.J. (DTIC No. ADA531635).

Our previous research demonstrated that for teleoperation of a simulated micro-unmanned aerial vehicle (MAV), flight skill missions were completed faster using a game controller than a mouse as the input device (Billings & Durlach, 2008; Durlach, Neumann, & Billings, 2008). The present experiment examined three factors that may have led to this advantage: attention (focused vs. divided), control of vehicle speed (user controlled vs. system), and movement ability (one direction vs. multiple directions at a time). Fifty participants were randomly assigned to one of five input device configurations and underwent operator training, which included simulated flight skill and reconnaissance missions in two synthetic environments. Movement in multiple directions yielded significantly faster mission completion than single direction movement in flight skill missions. User-controlled speed yielded significantly faster mission completion in reconnaissance missions. The attentional manipulation failed to influence performance. Workload was rated lowest when the user had focused attention, control of speed, and multiple directions of movement simultaneously. The results suggest that various features of the input device contribute differently to performance and perceived workload, depending on the required task, and demonstrate the importance of matching input device characteristics to task characteristics for human-computer interaction.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA531635>

TR 1274 — Replaced by TR 1308

TR 1275**Self-Initiated Development of Leadership Capabilities: Toward Establishing the Validity of Key Motivational Constructs and Assessment Tools.** (2010). Maurer, T.J., & Lippstreu, M. (DTIC No. ADA532359)

To meet the transformation objectives of the United States Army over the coming decades, the Army must have leaders or potential leaders who continuously pursue development of leadership skills, and who are flexible and adaptable through their involvement in self-initiated development and learning experiences. A key first step in this process is to develop constructs and assessment methods, including a network of related constructs, that would help establish construct validity. In this vein, the goal of this basic research was to initiate development of new constructs and assessment methods that are central to the process of motivating leadership development. The motivation to develop leadership constructs measured in this research is conceptually and empirically distinguishable from other relevant constructs and provides utility above and beyond other existing constructs in relation to leadership development behavior and career success. The Army might explore the use of these measures as diagnostic tools prior to investing in leadership development. To the extent that these measures predict effectiveness in adapting to leadership roles or learning and developing necessary skills, these tools might be used in selection and placement within the Army.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA532359>

TR 1276

Measuring Cross-Cultural Competence in Soldiers and Cadets: A Comparison of Existing Measures. (2010). Abbe, A., Geller, D.S., & Everett, S.L. (DTIC No. ADA533441).

Assessment tools are needed to support efforts to train and develop cultural capabilities in Soldiers and other military personnel. The Army and other Services have implemented training and education programs to develop cultural capabilities in military personnel; however, methods and tools to assess cultural learning are lacking. The goal of the present research was to identify metrics developed to assess cross-cultural competence and related constructs in non-military populations and to compare them in an Army sample. Cadets at the U.S. Military Academy and active-duty Soldiers completed the Cultural Intelligence Scale, the Multicultural Personality Questionnaire and the Intercultural Development Inventory. Results showed substantial convergence among the three measures, as well as correlations with biographical variables previously linked with cross-cultural competence. Results also indicated that officers have higher levels of intercultural development and traits than NCOs. Current findings and past research suggest that the MPQ shows promise for predicting intercultural performance; however, due to our sample, we were unable to examine the measure's structure. Future research should examine the extent to which these traits can be influenced through training and other developmental interventions. Future research into the assessment of cross-cultural competence should also explore alternatives to self-report measures.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA533441>

TR 1277

Assessing the Development of Cross-Cultural Competence in Soldiers. (2010). McCloskey, M.J., Grandjean, A., Behymer, K.J., & Ross, K.G. (DTIC No. ADA533959).

The contemporary operational environment is often characterized by ambiguous, multi-cultural contexts, where Army Soldiers must rapidly adapt without extensive prior knowledge of a region or its people. Ongoing training development efforts are addressing the need for general cross-cultural competence, but this broad competence must be clearly defined and assessed in order to determine if Soldiers are being adequately prepared. To support this goal, this research effort examined how cross-cultural competence develops in Soldiers, and how that competence supports mission success. Using multiple methodologies, including cognitive task analysis, critical incident elicitation, and review of existing models, we developed a model of cross-cultural competence that includes 28 knowledge, skills, attitudes and abilities (KSAAAs) over four levels of development. This model will inform the development of metrics to assess Soldiers' cross-cultural competence and provide relevant feedback.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA533959>

TR 1278

A Developmental Model of Cross-Cultural Competence at the Tactical Level. (2010). McCloskey, M.J., Behymer, K.J., Papautsky, E.L., Ross, K.G., & Abbe, A. (DTIC No. ADA534118).

Non-kinetic engagements in multi-cultural settings are becoming the norm for deployed Soldiers, and the ability to operate effectively within these environments is critical to mission success. Soldiers must be able to rapidly adapt to unfamiliar surroundings without extensive prior knowledge of the region or its people. Ongoing training development efforts are addressing the need for general cross-cultural competence (3C). To support these efforts, this research aimed to identify the critical components of 3C

and describe how 3C develops in Soldiers. Five components of 3C were identified: Cultural Maturity, Cognitive Flexibility, Cultural Knowledge, Cultural Acuity, and Interpersonal Skills. These components and their corresponding KSAs were used in identifying four levels of 3C development: Pre-Competent, Beginner, Intermediate, and Advanced. This model establishes a foundation from which to create an online tool that measures competence of an individual Soldier and provides feedback to support improvement. The tool may also be useful for evaluating the effectiveness of cross-cultural training initiatives. This model is specifically focused on understanding tactical level operations, but can be customized for applications across domains, both within and outside military settings.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA534118>

TR 1279

Developing Intercultural Adaptability in the Warfighter: A Workshop on Cultural Training and Education. (2010). Abbe, A., & Bortnick, R. (DTIC No. ADA533997).

From humanitarian relief operations to counter-insurgency operations in Iraq and Afghanistan, culture has emerged as a central consideration for both general-purpose forces and specialists. Cultural training and education can provide the capabilities needed to confront the cultural complexity characteristic of the current and future missions. A two-day workshop focused on the instructional design process as applied to the development of cultural training and education. Participants were approximately 130 representatives from government, industry, and academia who are actively involved in planning, developing, or delivering cultural training and education or in conducting research in those areas. Research gaps needing further investment were identified in six primary areas: cultural performance requirements analysis, learner motivation and development, development and validation of instructional sociocultural content, flexible instructional solutions, methods and metrics for training evaluation, and continuing opportunities for exchange and collaboration. These findings can inform future directions for research programs and force development efforts for sociocultural capabilities.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA533997>

TR 1280

Understanding and Managing the Career Continuance of Enlisted Soldiers. (2010). Young, M.C., Kubisiak, U.C., Legree, P.J., & Tremble, T.R. (DTIC No. ADA538015).

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) implemented a large research program titled "STAY: Strategies to Enhance Retention." The enlisted portion of the STAY project identified factors influencing enlisted Soldiers' career continuance decisions, developed a model of the decision process, generated an extensive list of attrition and retention interventions, and evaluated two of them. Interviews and focus groups across Training and Doctrine Command (TRADOC) and Forces Command (FORSCOM) were conducted during FY06 and FY07 to identify factors influential to both enlisted attrition and retention. The FY06 Trainee Inventory and Soldier Inventory were developed and administered to further inform model development. The resulting career continuance model for enlisted Soldiers accounted for growth and development of Soldiers, influential experiences, individual characteristics, and Family and organizational influences; it also drove the intervention development. A multi-phase process was used to develop and pilot-test interventions for decreasing attrition and improving enlisted Soldier career continuance. Promising interventions were identified based on feedback from ARI and Subject Matter Expert (SME) advisory panels on feasibility and potential success. Two interventions (Soldier Transition Survey and Unit Retention Climate Feedback System) were further investigated. The Soldier Transition Survey provided useful empirical information on factors driving career continuance decisions and demonstrated the value of alternate sources (i.e., proxies) for capturing this information. The Unit Retention Climate Feedback System examined shared unit-level perceptions influencing decisions to reenlist or leave the Active Army, and provides an approach for feeding that information back to unit leaders.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA538015>

TR 1281

Knowledge, Skills, and Abilities for Military Leader Influence. (2011). Wisecarver, M.M., Schneider, R.J., Foldes, H., Cullen, M.J., & Zbylut, M.L. (DTIC No. ADA540059).

Military leaders must effectively use influence across a variety of contexts and people. This report provides a comprehensive review of leader influence strategies and the factors that impact the influence process and influence outcomes. A detailed description is provided of the knowledge, skills, abilities, and other characteristics (KSAOs) related to successful influence, and measures currently available for these KSAOs are presented. This report also discusses the usefulness of different measurement

approaches for the 64 identified KSAOs. Finally, training needs and approaches to develop a leader's influence KSAOs are discussed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA540059>

TR 1282

Assessment of Assembling Objects for Improving Predictive Performance of the Armed Forces Qualification Test. (2011). Anderson, A., Hoffman, R.R.III, Tate, B., Jenkins, J., Parish, C., Stachowski, A., & Dressel, J.D. (DTIC No. ADA542559).

The purpose of this investigation was to examine whether the Assembling Objects test (AO) should be added to the AFQT predictor composite. The investigation included a literature review and analysis of data from Army Classification project. Analyses included regressions with 20 different criteria, subgroup analyses, and bias analyses. Findings suggest that the Army should consider including the AO subtest in the AFQT predictor composite. Adding the AO subtest to the AFQT composite would likely increase the prediction of performance and job knowledge, while potentially decreasing the subgroup predictor differences between Hispanic and white subgroups. Although adding the AO subtest to the AFQT composite may increase the subgroup predictor differences of female and black subgroups relative to their respective majority comparison groups, results suggest that any additional subgroup differences would be borne out in performance differences, and that the revised AFQT composite would thus be fair and unbiased to minority groups.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA542559>

TR 1283

Tier One Performance Screen Initial Operational Test and Evaluation: Early Results. (2011). Knapp, D.J., Heffner, T.S., & White, L.A. (2011). (DTIC No. ADA544437).

Along with educational, medical, and moral screens, the U.S. Army uses a composite score from the Armed Services Vocational Aptitude Battery (ASVAB), the Armed Forces Qualification Test (AFQT) to select new Soldiers. Although the AFQT is useful for selecting new Soldiers, other personal attributes are important to Soldier performance and retention. Based on the U.S. Army Research Institute's (ARI) investigations, the Army selected one promising measure, the Tailored Adaptive Personality Assessment System (TAPAS), for an initial operational test and evaluation (IOT&E), beginning administration to applicants in 2009. Criterion data are being collected at 6-month intervals from administrative records, from Initial Military Training (IMT), and from schools for eight military occupational specialties (MOS) and will be followed by two waves of data collection from Soldiers at first unit of assignment. This is the first of six planned evaluations of the IOT&E. This report documents the early analyses from a small sample of Soldiers who completed the TAPAS and completed IMT. Similar to prior experimental research, our early evaluation suggests that several TAPAS scales significantly predicted a number of criteria of interest, indicating that the measure holds promise for both selection and classification purposes.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA544437>

TR 1284

Training, Developing, and Assessing Cross-Cultural Competence in Military Personnel. (2011). Caligiuri, P., Noe, R.A., Nolan, R., Ryan, A.M., & Drasgow, F. (DTIC No. ADA559500).

This report provides information and recommendations regarding how the Army might train, develop and assess cross-cultural competence of Soldiers. Findings are presented in four main sections. The first section discusses the importance of cross-cultural competence to mission accomplishment and describes two facets of cross-cultural competence: cultural learning and cultural agility. Next, methods for developing and sustaining these facets are provided. These methods include an overall learning system that blurs the lines between operational and institutional learning experiences, as well as more specific techniques and practices for cultural learning and cultural agility. The third section discusses the importance of assessing cross-cultural competence and addresses the questions of who and what should be assessed and how assessments might be conducted. The final section of the report summarizes recommendations regarding training, development, and assessment and highlights key resource needs, anticipated challenges, and next steps.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA559500>

TR 1285

Virtual Environments for Soldier Training via Editable Demonstrations. (2011). Szczepkowski, M., Santarelli, T.P., Stagl, K., Glenn, F., & Paulus, J. (DTIC No. ADA 542583).

While demonstrations are recognized as an effective tool to train key Army relevant skills, there is little detailed guidance on how to generate and present effective demonstrations. CHI Systems created a demonstration authoring tool, called the Virtual Environments for Soldier Training via Editable Demonstrations (VESTED), which guides an author through a demonstration creation process to select the specific learning goals to be demonstrated and to construct storyboards depicting the underlying behaviors, cognitive decisions and tasks being demonstrated. VESTED also aids the author in making the decisions about where and how to use the virtual environment (VE) medium and all of the other relevant authoring tools. The use of VESTED should reduce instructor workload and improve instructor efficiency by reducing the cost of developing demonstrations and permitting demonstrations to be executed on a wide-variety of affordable computer hardware.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA542583>

TR 1286

Investigating Validity Evidence for a Measure of Military Judgment Proficiency. (2011). Billington, A.Q., Beal, S.A., Ferro, G.A., & Foldes, H. (DTIC No. ADB370655 / Restricted).

TR 1287

Feedback in Videogame Based Adaptive Training. (2011). Rivera, I.D. (DTIC No. ADA544082).

The field of training has been changing rapidly due to advances in technology such as videogame-based adaptive training. Videogame-based adaptive training has provided flexibility and adaptability for training in cost-effective ways. While this method of training may have many benefits for the trainee, current research has not kept up to pace with its implementation. This research closes this gap by testing four competing feedback and training theories. The ACT-R theory and the feedback intervention theory provide different recommendations for the frequency (frequent or infrequent) that feedback should be provided during training. Self-efficacy theory and control theory provide different recommendations for the appropriate feedback sign (positive or negative) that should be provided during training. Research was conducted in which the frequency of feedback and feedback sign were manipulated in a videogame-based adaptive training environment. MANOVA results indicate that frequent negative feedback and infrequent positive feedback were beneficial to trainee performance. The role of feedback orientation was also examined as a moderator of the relationship between feedback and performance, but was not supported. The findings serve as a framework for practitioners in determining the necessary type of feedback needed when designing videogame-based adaptive training.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA544082>

TR 1288

A Framework for Understanding Collective Leadership: The Selective Utilization of Leader and Team Expertise within Networks. (2011). Friedrich, T.L., Vessey, W.B., Schuelke, M.J., Ruark, G.A., & Mumford, M.D. (DTIC No. ADA544438).

To date, the dominant approach to leadership research assumes that all aspects of the leadership role within a team are embodied by a single individual. In the real world, however, this is rarely the case. Rather, multiple individuals within the team may serve as leaders in both formal and informal capacities, and the shifting of leadership responsibilities is often rooted in which individual's expertise is most relevant to the given problem. In the present effort, we add to the rapidly growing body of work that focuses on the distribution of the leadership role among multiple individuals. We have reviewed relevant extant literature and proposed an integrated framework for understanding the collective leadership process. Also, in developing this framework we have taken an information and expertise-based approach such that we propose that collective leadership, or the distribution of the leadership role, is a function of selectively utilizing the information or specialized expertise that individuals within the network possess. In reviewing the framework, 55 propositions with regard to the collective leadership process are outlined and suggestions for future research are provided.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA544438>

TR 1289

Developing Collective Training for Small Unmanned Aerial Systems Employment: Workload and Performance with Multiple Systems. (2011). Priest, H.A., Durlach, P.J., & Billings, D.R. (DTIC No. ADA544540)

A research simulation environment was developed to investigate training issues concerning employment of small unmanned aerial systems (SUAS) at company and below. The research environment enables

simulated platoon missions in a virtual environment in which mounted or dismounted Soldiers control avatars. A person designated as SUAS operator also has the ability to operate a SUAS in the virtual environment. Another person designated as the commander has a command and control tool (C2node), which allows communication and coordination with the SUAS operator (e.g., text messages, mission plans, sensor imagery). Both the operator's control station and the C2node are configurable, to allow investigation of how different features (e.g., providing the C2node with streaming video vs. not) affect mission synchronization and maintenance of a common operational picture. Besides human-controlled avatars, the environment also allows for artificially intelligent non-player characters (NPCs), whose behavior can be scripted via a system of relatively-user friendly menus, prior to a scenario exercise. Experimenters can also take manual control of these NPCs during an exercise. This report describes the capabilities of the environment and an initial experiment providing evidence that users can operate the C2node and an avatar at the same time. The potential for future research application is also discussed. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA544540>

TR 1290

Current Practice and Theoretical Foundations of the After Action Review. (2011). Mastaglio, T.W., Wilkinson, J., Jones, P.N., Bliss, J.P., & Barnett, J.S. (DTIC No. ADA544543).

This report presents a research effort to investigate After Action Review (AAR) practices, relevant science-based principles and theories, and develop actionable conclusions. The effort investigated theoretical foundations, doctrinal guidance, and the perceptions of Army personnel regarding the importance of AAR to training effectiveness. The key findings from this research show that AAR is a fundamental part of the Army training culture with recognized value at the trainer and trainee level. A reference model, the Integrated Theory of AAR (ITAAR) is described together with educational and information dissemination recommendations that will strengthen Army-wide expertise and enhance the practice of AAR as a key methodology for supporting the training process. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA544543>

TR 1291

Training Tactical Level Planning Skills: An Investigation of Problem-Centered and Direct Instruction Approaches. (2011). Tucker, J.S., Semmens, R.P., Sidman, J., Geyer, A., & Vaughn, E.D. (DTIC No. ADA545362).

The purpose of the present research was to inform training developers of the instructional approaches that are most effective in achieving cognitive skill proficiency for problem-based, decision-making/analyzing tasks. Prototype training modules were developed and used in experiments to determine the effects of three different instructional approaches [inquiry-based learning (IBL), direct instruction (DI), and the Invention Framework (IF)] on student outcomes. However, due to the small sample sizes across the three experiments, the results of this research should be considered a pilot effort. Therefore, the contribution of the research is best reflected in the reporting of the instructional design and methodology of each approach as well as an indication of the advantages and disadvantages of using these approaches for Army training. Further research is needed to determine the validity of the approaches for training a range of tasks under various training and transfer conditions. Future research should draw from the training presented here and develop additional exemplars of each approach that can be further demonstrated and evaluated. The software for the IF approach and full slide packets for the DI and IBL approaches are freely available by contacting the first author of this report at the above address. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA545362>

TR 1292

Top Training Needs of U.S. Army Operational Units as Assessed through Review and Analysis of Center for Army Lessons Learned Commander Interviews. (2011). Fite, J.E., & Shadrack, S.B. (DTIC No. ADB372480 / Restricted).

TR 1293

Validating Future Force Performance Measures (Army Class): First In-Unit Performance Longitudinal Validation. (2011). Knapp, D.J., Owens, K.S., & Allen, M.T. (DTIC No. ADB371113 / Restricted).

TR 1294

Guidelines and Tools for VBS2 Mission After Action Reviews: Development and Evaluation. (2011). Topolski, R., Green, C., Leibrecht, B.C., & Rossi, N. (DTIC No. ADA548307).

This report documents the creation and evaluation of a guide designed to assist facilitators who conduct after action reviews (AAR) of missions executed using the Virtual Battlespace-2 (VBS2) game. Observations of course-related exercises suggest there is a clear need for the guide. The results of the formative evaluation and an exploratory investigation indicate the guide meets the need. The guide is available as a stand-alone document in ARI Research Product 2011-09, After Action Review Guide for Trainers of Virtual Battlespace-2 Missions. It is also a valuable addition to the Soldiers' Toolbox for Developing Tactics, Techniques, and Procedures, ARI Research Product 2011-08, which resulted from earlier research. The results of the exploratory investigation strongly suggest that effectively employing VBS2 AAR capabilities is a key factor in engendering "buy-in" for simulation-based training among facilitators and Soldiers. The report includes lessons learned and recommendations for disseminating and utilizing the guide.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA548307>

TR 1295

Army Officer Job Analysis: Identifying Performance Requirements to Inform Officer Selection and Assignment. (2011). Paullin, C., Sinclair, A., Moriarty, K.O., Vasilopoulos, N.L., Campbell, R.C., & Russell, T.L. (DTIC No. ADA548872).

This report includes lists of leadership and technical duties performed by all Army officers and the skills, abilities, and other characteristics (SAOs) required to perform those duties. It also includes draft lists of branch-specific technical duties for entry-level officer positions in five branches: Armor, Infantry, Signal, Quartermaster, and Transportation. We developed draft lists based on existing Army doctrine and past studies of officer competencies and duty requirements, supplemented by the civilian leadership literature, research on Army enlisted jobs, and research on attributes related to retention. The lists were vetted by Army officers in several positions (platoon leader, company commander, battalion XO, battalion S3, and battalion commander), although there were very few reviewers from higher-ranking positions. We could not fully delineate branch-specific technical duties due to the lack of current documentation and difficulty accessing officers as subject matter experts. As a consequence, additional research and significant input from Army officers would be required to fully delineate branch-specific requirements for the Signal, Quartermaster, and Transportation branches. However, detailed specification of branch-specific technical requirements is not necessary to support development of predictor and criterion measures for use in entry-level selection and initial officer assignment.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA548872>

TR 1296

Tier One Performance Screen Initial Operational Test and Evaluation: 2010 Annual Report. (2011). Knapp, D.J., & Heffner, T.S. (DTIC No. ADA552618).

Along with educational, medical, and moral screens, the U.S. Army uses a composite score from the Armed Services Vocational Aptitude Battery (ASVAB), the Armed Forces Qualification Test (AFQT), to select new Soldiers. Although the AFQT is useful for selecting new Soldiers, other personal attributes are important to Soldier performance and retention. Based on the U.S. Army Research Institute's (ARI) investigations, the Army selected one promising measure, the Tailored Adaptive Personality Assessment System (TAPAS), for an initial operational test and evaluation (IOT&E), beginning administration to applicants in 2009. Criterion data are being compiled at 6-month intervals from administrative records, from Initial Military Training (IMT), and from schools for eight military occupational specialties (MOS) and will be followed by multiple waves of data collection from Soldiers in units. This is the second of six planned evaluations of the IOT&E. Similar to prior experimental research, our early evaluation suggests that several TAPAS scales significantly predicted a number of criteria of interest, indicating that the measure holds promise for both selection and classification purposes.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA552618>

TR 1297

Designing Adaptive Instructional Environments: Insights from Empirical Evidence. (2011) Durlach, P.J., & Ray, J. (DTIC No. ADA552677).

In adaptive instructional environments, instructional interventions and/or content can be adapted to an individual learner's competence level or other characteristics. The intention behind adaptation is to maintain the optimal level of challenge for each individual student, to provide support, and to correct misconceptions. This report reviews technology-based adaptive instructional procedures. To be included, an experiment had to describe a direct comparison of learning outcomes resulting from an

adaptive system vs. a non-adaptive system, or one adaptive method vs. another. Many of the experiments used multiple adaptive interventions together, making it difficult to determine the relative contribution of the different types of adaptive interventions to the superior learning outcomes. Consequently, we were unable to conclude which adaptive techniques might be more effective than others. Nevertheless, based on our analysis, we suggest the following adaptive techniques as the most likely to provide learning payoffs: (1) Error-sensitive feedback, (2) Mastery Learning, (3) Adaptive spacing and repetition for drill-and-practice items, (4) Fading of worked examples for problem solving situations, or fading of demonstrations for behavioral tasks (such as in scenario-based simulations), and (5) Metacognitive prompting, both domain relevant and domain independent.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA552677>

TR 1298

Criterion Related Validity of Non-Cognitive Screening Measures among Soldiers with Enlistment Waivers. (2011). Fleisher, M.S., Putka, D.J., & Dressel, J.D. (DTIC No. ADA552532).

This report examines the criterion-related validity of the U.S. Army Research Institute for the Behavioral and Social Sciences' (ARI's) on-cognitive measures for predicting various types of performance, attitudinal, and retention criteria for Soldiers who required waivers for entry. We conducted analyses to evaluate the prediction provided by each instrument in isolation, as well as additional prediction beyond that provided by the Armed Forces Qualification Test, or AFQT-the primary cognitive measure used by the Army for making selection decisions. All analyses were conducted using Soldier data from ARI' Army Class Longitudinal Validation database and Tier One Performance Screen Initial Operational Test and Evaluation (TOPS IOT&E) database, coupled with waiver data obtained from the U.S. Army Recruiting Command (USAREC). The extensive analyses conducted in this research provide evidence that ARI's non- cognitive measures are as valid for Soldiers with waivers as they are for Soldiers without waivers. Although differences in validity do appear, these differences are small; if anything, as a whole, these non-cognitive measures appear to be very slightly more valid for Soldiers with waivers, although it depends upon the specific measure in question.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA552532>

TR 1299

Training Capabilities of Wearable and Desktop Simulator Interfaces. (2011). Taylor, G. S., & Barnett, J.S. (DTIC No. ADA552441).

The use of game-based simulations (GBS) for training has considerable potential. However, there are a number of different methods available to present the training, including traditional desktop computer interfaces, or newer wearable computer interfaces that simulate the Soldier's load bearing equipment. The wearable interface employs a helmet mounted display (HMD), sensors positioned on the Soldier's body, and controls mounted on a simulated rifle. As of yet, the advantages of wearable simulator interfaces for training have not been validated by research. Therefore, the TRADOC Capability Manager Virtual Training Environments requested that ARI conduct a study to determine the training advantages of wearable and desktop interface simulators. Ninety-eight participants with no prior military training were trained in a number of U.S. Army warrior skills using one of three methods: a GBS using a wearable interface, a GBS using a desktop interface, and the standard U.S. Army animated training video. Participants in both GBS conditions controlled an avatar in a virtual environment (VE) and watched an instructor avatar demonstrate each of the warrior skills. After each demonstration, the participant was able to practice the skill in the VE with guidance from the instructor. Participants in the control condition simply watched the training video. To measure skill retention, participants were asked to watch a series of short (8-16 second) video captures of an avatar in a VE performing the same warrior skills. After each video clip, they were asked to free recall both correct and incorrect procedures demonstrated by the avatar. Results showed there were no significant differences among the three groups in recall of correct and incorrect steps of the warrior skills. However, the desktop and the wearable groups reported significantly more Presence, Engagement, and Interest/Enjoyment than the control group, with no differences found between the desktop and wearable groups.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA552441>

TR 1300

Defining Antecedents for Noncommissioned Officer Self-Learning: A Review of the Literature. (2012). Wisecarver, M.M., Foldes, H., Ferro, G.A., Cullen, M.J., Graves, T.R., Rauchfuss, G., Wolfson, N., & Kraiger, K. (DTIC No. ADA570568).

We reviewed the scientific literature on self-directed learning, self-regulation of learning, motivation for self-learning, and organizational supports for self-directed learning. Findings based on the review were set in the context of the Army Learning Model 2015 (Army Learning Concept 2015). Recommendations were made concerning organizational and training support for the development and enhancement of self-directed learning skills, with a focus on developing enlisted Soldiers and Army NCOs. Various techniques and approaches are proposed concerning measurement of self-learning and the acquisition of self-learning skills within the Army NCO Corps.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA570568>

TR 1301

Determinants of the Army Applicant Job Choice Decision and the Development of a Decision Support Tool for the Enlistment Incentive Review Board: Phase 1. (2102). Diaz, T.E., Sticha, P.J., Hogan, P.F., Mackin, P.C., & Greenston, P.M. (DTIC No. ADA570569).

The Army offers a variety of enlistment incentives to encourage applicants to choose Military Occupational Specialties (MOS) where the need is greatest. MOS incentive types, levels, amounts, and qualification criteria are determined by the Enlistment Incentive Review Board (EIRB). To help the EIRB effectively and efficiently perform this function, this research reviewed current incentive policy decision making process and tools, estimated a Job Choice Model (JCM) based on actual applicant choice data from the Army's Recruit Quota System (REQUEST) for the first and second quarters of FY 2010, and developed a proof-of-concept Decision Support Tool (DST) based on the JCM for predicting the number of enlistments by MOS and Term of Service (TOS) and associated cost given a user-defined policy scenario. The effects of incentives on applicant enlistment choices estimated by the JCM were intuitive for simple policy changes and more difficult to anticipate for more complex policy changes. The benefit of the JCM is that effects of policy changes on MOS fill and budget can be quantified objectively. The proof-of-concept DST demonstrated the value of a tool for informing the EIRB in allocating incentives to MOS and TOS enlistment options that can provide the most benefit to the Army.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA570569>

TR 1302

Emotions at Work: Leader Knowledge, Skills, and Abilities to Enhance Soldier Performance. (2012). Kaplan, S., Cortina, J., Ruark, G.A., Orvis, K.L., Engel, K., & Langkamer, K. (DTIC No. ADA559313).

Every context and situation has the potential to evoke an emotional response in a Soldier; such emotions may include happiness, boredom, anxiety, and fear. Success in dealing with these situations requires that Army leaders leverage the emotional properties of a situation to exert influence on one or more Soldiers in order to attain a desired outcome. Army leaders, however, receive little training in this area. Neither the Army Leadership Field Manual (U.S. Department of the Army FM 6-22, 2006) nor the psychology research literature provides detailed guidance regarding the trainable attributes needed to manage emotions in self and others. The purpose of this Phase I STTR work was to compile and synthesize research from various domains in order to better understand the nature of emotional management and the attributes that predict it. This report outlines specific knowledge, skills, abilities, and other capabilities that predict leaders' success in executing eight categories (i.e., dimensions) of emotion management behaviors, which are posited to impact proximal outcomes and, in turn, ultimate outcomes. Implications for the U.S. Army are discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA559313>

TR 1303

Adaptive and Nonadaptive Training Technology for Small Unmanned Aerial System Employment. (2012). Durlach, P.J.D., Dargue, B.W., & Goldberg, S.I. (DTIC No. ADA557064).

The purpose of the research and development described here was to compare the effectiveness of adaptive and one-size-fits-all technology-enabled training, holding all factors besides the adaptation constant. Adaptive features included selection of up-front instruction based on pretest performance, branching scenario-based decision making, and within-scenario remediation. The domain for the training was company and below employment of small unmanned aerial systems (SUAS). In particular, the training content was selected to provide leaders at company and below the knowledge required to integrate SUAS operation into their missions, conduct relevant troop leading procedures, and supervise execution of SUAS flights. There failed to be a significant difference in learning outcomes between the adaptive and the nonadaptive versions, when tested with 24 Soldiers; however, there were learning

gains with both systems, and Soldiers appraised the training effectiveness of the adaptive system to be superior to that of the nonadaptive system.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA557064>

TR 1304

Technology for the Enhanced Command and Control of Small Robotic Assets. (2012). Freedy, A., LeGoullon, M., deVisser, E., Freedy, E., Parasuraman, R., & Durlach, P.J. (DTIC No. ADB379044 / Restricted).

TR 1305

Junior Leader Training Development in Operational Units. (2012). Pax, E.V., Dyrland, A., & Tucker, J.S. (DTIC Nos. ADA56729 / Report; ADM002362 / CD-ROM).

The Junior Leader Training Development Tool (JLTDT) was created to instruct junior leaders in the processes of training development and provide training development job aids to assist in developing effective training products. The development of the JLTDT was based on a comprehensive literature review and subject matter expert feedback from U.S. Army Forces Command (FORSCOM) units and U.S. Army Training and Doctrine Command (TRADOC) agencies. The JLTDT is an interactive training development tool that consists of a central database of training resources and training plans posted by junior leaders and a checklist of training development steps seen in the 8-Step Training Model. This report documents the process that was used to develop the JLTDT as well as the application of the tool (Appendix A). The prototype tool was coordinated with the Army Training Network (ATN), and ATN website developers incorporated some of its content into the ATN website. A CD is enclosed with the source code for the prototype tool. The source code is written in Visual Studios 2008. The CD also includes the back-up files, images, and links to the various job aids in the tool.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA567291>

TR 1306

Tier One Performance Screen Initial Operational Test and Evaluation: 2011 Interim Report. (2012). Knapp, D.J., & Heffner, T.S. (ADA563937)

Along with educational, medical, and moral screens, the U.S. Army uses a composite score from the Armed Services Vocational Aptitude Battery (ASVAB), the Armed Forces Qualification Test (AFQT), to select new Soldiers. Although the AFQT is useful for selecting new Soldiers, other personal attributes are important to Soldier performance and retention. Based on the U.S. Army Research Institute's (ARI) investigations, the Army selected one promising measure, the Tailored Adaptive Personality Assessment System (TAPAS), for an initial operational test and evaluation (IOT&E), beginning administration to applicants in 2009. Criterion data are being compiled at 6-month intervals from administrative records, from Initial Military Training (IMT), and from schools for eight military occupational specialties (MOS) and will be followed by multiple waves of data collection from Soldiers in units. This is the third of six planned evaluations of the TAPAS. Similar to prior research, results thus far suggest that several TAPAS scales significantly predict a number of criteria of interest, indicating that the measure holds promise for both selection and classification purposes.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA563937>

TR 1307

How Simulator Interfaces Affect Transfer of Training: Comparing Wearable and Desktop Systems. (2012). Barnett, J.S., & Taylor, G.S. (DTIC No. ADA564898).

The present research compared the training effectiveness of a wearable computer interface versus a desktop interface. Teams of two participants were trained in military hostage rescue procedures, one using the wearable interface, a second group using a desktop interface, while a control group was trained in a live physical room using replica weapons and military equipment. Teams completed four training sessions, followed by four test sessions in the live room. Teams were scored on number of correct actions and time to complete the session. The control condition performed significantly better on the test scenarios than either of the simulator conditions. However, there were no significant differences in performance between the wearable or desktop simulation conditions. The number of correct actions for both simulator conditions were statistically equivalent, and slightly lower than the control condition. There was also no significant difference between the two simulator training groups in terms of time to complete the test scenarios. Both simulator conditions were significantly slower to complete the scenarios than the control condition, with the magnitude of this difference diminishing over time.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA564898>

TR 1308**The Importance of Cognitive Factors that Guide Escalation of Force Decisions.** (2012). Vowels, C.L. (DTIC No. ADA563982).

The purpose of this report is to explore previous models of Escalation of Force (EOF) and provide a revised model based on pre-decisional cognitive factors that influence Soldiers' decisions prior to engagement in escalation procedures. Previous models were largely reactive, assuming that Soldiers' ability to make decisions was constant across situations (e.g., regardless of cognitive workload or other operational conditions). The proposed pre-decisional space model takes a cognitive-perceptual perspective and focuses on factors that influence information processing. This information processing leads to judgments and decisions occurring prior to engagement in escalation procedures. Further, two previous U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) avenues of research, specifically training on nonverbal behavior and on military judgment proficiency, are recommended as viable approaches to assess the validity of the pre-decisional space model and as effective approaches for enhancing Soldier capabilities in EOF situations.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA563982>

TR 1309**Assessing Interpersonal Trust in Networked Teams.** (2012). Cianciolo, A.T., & DeCostanza, A.H. (DTIC No. ADA566279).

Joint, interagency, and multinational (JIM) operations are characterized by persistent disunification of both command and effort, requiring strong interpersonal relationships to accomplish shared objectives. Trust is thought to be one characteristic of these relationships. Improving the effectiveness of Army personnel serving on JIM command and control (C2) teams therefore requires an understanding of how interpersonal trust functions in networked collectives, how it can be measured, and how it can be enhanced through preparation and intervention. The purpose of this 4-year research effort is to develop and test a conceptual model of interpersonal trust in groups conducting technology-mediated work. The model will be applied to identifying behavioral indicators of trust and to designing methods for building trusting relationships. This report documents research focused on theoretical model development conducted within the first 2 years of this project.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA566279>

TR 1310**Leader Identity, Individual Differences, and Leader Self-Development.** (2012). Key-Roberts, M., Halpin, S.M., & Brunner, J.M. (DTIC No. ADA565314).

This research is an extension of the Baseline Officer Longitudinal Development Study (BOLDS), an ongoing longitudinal project initiated at the United States Military Academy at West Point (USMA) in 1994. West Point graduates from the class of 1998 were recruited from a 10-year reunion celebration during the fall of 2008. Ninety-nine Soldiers completed online measures of leadership and performance. The focus of the present research was on four potential predictors of leader self-development: leader identity, leader self-efficacy, motivation to lead, and learning goal orientation. Contrary to expectations, leader identity was not a strong predictor of leader-initiated developmental activity. Consistent with prior research and theory, support for a strong relationship between leader identity, leader self-efficacy, and motivation to lead was demonstrated. Finally, results indicate that motivation to lead alone does not mediate the relationship between identity, self-efficacy, and leader self-development behavior. Overall, results suggest that seeing oneself as a leader and believing in one's capabilities to lead may be precursors to feeling motivated to participate in leadership roles. Additionally, Soldiers who are motivated to lead are more likely to engage in leader self-development behaviors when they view abilities as something that can be developed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA565314>

TR 1311**Development of the Tailored Adaptive Personality Assessment System to Support Army Personnel Selection and Classification Decisions.** (2012). Drasgow, F., Stark, S., Chernyshenko, O.S., Nye, C.D., Hulin, C.L., & White, L.A. (DTIC No. ADA564422).

The U.S. Army requires efficient and effective methods for entry-level Army selection and classification decisions. Accordingly, the Tailored Adaptive Personality Assessment System (TAPAS) was developed to assess personality factors related to performance in the Army. TAPAS assesses up to 21 sub-

dimensions of the Big Five personality factors and several additional personality characteristics relevant to military settings. Of particular importance is that TAPAS is designed to be resistant to faking good, so that it can be used for high stakes assessment such as enlistment testing. Each TAPAS item consists of two statements, balanced in social desirability, and a respondent picks the statement that is more like me. Two item pools were developed and item response theory was used for to administer items as a computerized adaptive test (CAT). Early results from an initial operational test and assessment (IOT&E) indicate little adverse impact on females and minority groups. In addition, mean scores for Army applicants who take TAPAS as part of enlistment screening are very similar to Air Force applicants who are administered TAPAS for research purposes only, which indicates good resistance to faking.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA564422>

TR 1312

Assessing the Tailored Adaptive Personality Assessment System as an MOS Qualification

Instrument. (2012). Nye, C.D., Drasgow, F., Chernyshenko, O.S., Stark, S., Kubisiak, U.C., White, L.A. & Jose, I.J. (DTIC No. ADA566090).

This report examines whether the Tailored Adaptive Personality Assessment System (TAPAS) may be useful for selecting and classifying recruits into Military Occupational Specialties (MOS) and describes the two broad approaches that were taken to evaluate the measure for these purposes. TAPAS data for this research were collected from Army applicants at the Military Entrance Processing Stations (MEPS) between May 2009 and June 2011. In addition, criterion data were collected in the Tier One Performance Screen (TOPS) program. The total sample size for this research was 151,625. With this data, we first examined the validity of TAPAS scales for predicting outcomes in four high density MOS including 11B, 31B, 68W, and 88M. Next, we examined whether the TAPAS scales could be used to differentiate high performers in each MOS from those that would perform better in a different occupation. Using composites of the TAPAS scales, results indicated that some individuals might perform better in an MOS other than the one they were assigned to. Therefore, TAPAS may be useful as a supplement to the current procedures for MOS qualification and classification.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA566090>

TR 1313

Follow-Up Evaluation of the Psychometric Properties of the Cadet Background Experiences Form.

(2012). Putka, D.J., Wasko, L., Kilcullen, R.N., & Legree, P.J. (DTIC No. ADB383409 / Restricted).

TR 1314

Validating Future Force Performance Measures (Army Class): In-Unit Performance Longitudinal Validation. (2012). Knapp, D.J., Owens, K.S., & Allen, M.T. (DTIC No. ADA569570).

The Army needs the best personnel to meet the emerging demands of the 21st century. Accordingly, it is seeking recommendations on new predictor measures, in particular, measures of noncognitive attributes (e.g., interests, values, temperament) that could enhance entry-level Soldier selection and classification decisions. The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) conducted a longitudinal criterion-related validation research effort to collect data to inform these recommendations. Data on experimental predictors were collected from approximately 11,000 Soldiers, and criterion data were collected from these Soldiers at three career points: end of training, after about 12-24 months in-service, and again about a year later. This report describes the two in-unit criterion data collections and criterion-related validation analysis results. Overall, many of the experimental predictors significantly incremented the Armed Forces Qualification Test (AFQT) in predicting Soldier performance. They also incremented the ability to predict retention-related attitudes and behavior over Education Tier. In addition, the predictors showed potential for improving job assignment decisions above and beyond the Armed Services Vocational Aptitude Battery. Due to the attrition of poor performing Soldiers, which reduces variance on the outcome measures, the strength of the results is somewhat diminished using in-unit data in comparison to training criterion data.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA569570>

TR 1315

Dissecting Situational Strength: Theoretical Analysis and Empirical Tests. (2012). Dalal, R.S., Meyer, R.D., Jose, I.J., Hermida, R., Vega, R.P., Chen, T.R., Hale, A., & Brooks, C.K. (DTIC No. ADA564311).

It has been argued that the most important characteristic of situations is their strength--and that dispositional forces predict behavior in weak, but not strong, situations. Until recently, however, there was little consensus regarding how to measure this construct. As a consequence, several behavioral predictions are less accurate than they could be. The current research presents a theoretically unified conceptualization of this construct (consisting of the four facets of clarity, consistency, constraints, and consequences), provides tests of its primary postulates, and assesses the effects of misfit between preferred and perceived levels of strength on the job. We found that situational strength influenced the impact of personality (conscientiousness and agreeableness) on citizenship and counterproductive (deviant) behavior at work. We also found that the deleterious impact of misfit between preferred and perceived levels of situational strength was worse for certain types of misfit than for others. We suggest fruitful avenues for future research as well as practical implications. Because recent changes in the Army's nature and structure have weakened the situations Soldiers commonly experience, the current research has considerable implications for Army research in Soldier selection, classification, and retention. Overall, the current research sheds considerable light on the phenomenon of situational strength.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA564311>

TR 1316

The Socio-Cultural Context of Operations: Culture and Foreign Language Learning for Company Grade Officers. (2012). Abbe, A., & Gallus, J.A. (DTIC No. ADA565311).

The purpose of this study was to identify the sociocultural aspects of mission performance for company grade officers and to identify a core set of learning objectives for the pre-commissioning phase of the Basic Officer Leader Course (BOLC-A). To determine what officers need to be able to do with regard to the sociocultural context of operations, data collections at several different installations were conducted about the nature, extent, and importance of officers' encounters with foreign cultures on deployment. Results informed the development of a draft cultural competency framework describing what officers do, or should do, to perform their missions effectively in an unfamiliar culture. Additional analyses based on these data collections as well as other Army doctrine resulted in updated Army Culture and Foreign Language Strategy (ACFLS) learning objectives for junior officers. Findings can be used to improve program planning for training and development initiatives, determine the extent to which the goals of the ACFLS are being met, and identify further training gaps. This research may also provide a useful method to follow in revising culture and foreign language learning objectives for other career stages and cohorts.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA565311>

TR 1317

Measuring Learning and Development in Cross-Cultural Competence. (2012). McCloskey, M.J., Behymer, K.J., Papautsky, E.L., & Grandjean, A. (DTIC No. ADA568555).

For deployed U.S. military personnel, cross-cultural skills are more important than ever before. Cross-cultural competence is critical to mission success, and specifically, because Soldiers can no longer predict where their next deployments may be, general cross-cultural competence (the ability to immediately adapt and assess in culturally unfamiliar environments to support mission success) is emerging as a critical competency. In the performance of this Phase II SBIR research and development effort, the research team conducted Cognitive Task Analysis methodologies with more than 400 Soldiers to create a developmental model of Army cross-cultural competence. This model describes the development of the knowledge, skills, aptitudes, and abilities that comprise cross-cultural competence in Army small unit leaders. Five unique, but interacting, factors of cross-cultural competence were identified through the research. The resultant model serves as a basis for an assessment methodology that includes self-report measures, situational judgment tests, and cultural vignettes. The model and metrics provided the foundation for the Cross-Cultural Assessment Tool (C-CAT), an online program that assesses an individual Soldier's cross-cultural competence and provides mission-relevant competence ratings, descriptions of individual strengths/weaknesses and how these can impact mission performance, and suggestions for improvement.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA568555>

TR 1318

Language and Social Dynamics. (2012). Pennebaker, J.W., & Chung, C.K. (DTIC No. ADA564471).

Some of the smallest words that people use in everyday life can reveal basic social and psychological processes. A series of studies were conducted to explore how basic group processes could be revealed by people's use of pronouns, articles, prepositions, and other function words. Through the analysis of transcripts of live and virtual working groups, informal groups, close relationships, and emails, it was possible to identify the relative status of group members as well as identify effective communication patterns. In addition, the computerized text methods were developed in ways that can capture near-real-time social processes in English and other languages. Implications of the findings include the ability to characterize group dynamics by the mere measurement of the words used in groups - a form of remote sensing. In addition, the studies point to ways of automatically shaping group dynamics in education or training so that they work more effectively. Finally, the current research provides a methodology to track real world group processes as they occur.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA564471>

TR 1319

Facial Affect Reciprocity in Dyadic Interactions. (2012). Matsumoto, D. (DTIC No. ADA565310).

The purpose of this effort was to examine a new theoretical framework called Facial Affect Reciprocity, which refers to the exchange of facial expressions among interactants across time, and the linkage between specific types of emotion. We examined whether different combinations of facial expressions of emotion of pairs of individuals engaged in an interactive game requiring cooperation and adaptation would be reliably related to objective performance data. Same-sex stranger dyads participated in three conditions of game play in three studies. The game used was a modified version of Prisoner's Dilemma, which was played in real time, in person, and with real money to maximize the interaction's effects on emotions and expressions. Facial affect reciprocity variables predicted the behavioral outcomes of the dyads above and beyond what could be predicted by the individual facial expression variables, as predicted. Surprisingly, however, it was not the exchange of emotional expressions per se that was the best predictor of the various outcomes; instead, it was the exchange of no emotions or neutrality that was the best predictor. These findings suggest a strong potential role for expression regulation in dyadic interchange, and they have important ramifications to theoretical and conceptual knowledge concerning the interpersonal functions of facial expressions of emotion. They also have important practical implications for emotion and expression regulation in team processes.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA565310>

TR 1320

Identification of Company Command Competencies. (2013). Ford, L.A., Wolters, H.M., Moriarty, K.O., Cullen, M.J., & Forrest, D. (DTIC No. ADA587475).

Company command currently has responsibilities that were once at the battalion or brigade command level, but now have been pushed down to the company level. This research identified 35 company command competencies required for successful performance in the current environment. Twenty-nine focus groups with current and former Company Commanders, Battalion Commanders, Small Group Leader Instructors at Captains Career Courses, Command Sergeants Major, First Sergeants and other senior noncommissioned officers helped to draft an initial competency model. Survey results from 138 Battalion Commanders, Company Commanders, and Small Group Instructors provided additional data concerning the (a) required proficiency levels for each competency, (b) extent to which each competency differentiates superior from less effective commanders, (c) extent to which competencies should be fostered in pre-command training, and (d) level of preparedness for competency-related job responsibilities. The survey also identified optimal training methods for five competency clusters: knowledge, leadership, operational, personal, and resource management. The Company Command Competency Model delineates the command responsibilities for this command level and can be used to identify gaps in pre-command courses and assess training effectiveness.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA587475>

TR 1321

Applications of Strengths Based Leadership Theory for the U.S. Army. (2012). Key-Roberts, M., & Budreau, M. (DTIC No. ADA565315).

The purpose of this research was to determine what strategies military leaders use to develop subordinate leaders, and if the current developmental process aligns with a strengths-based approach to

leader development. A total of 41 active military leaders were interviewed by researchers from the U.S. Army Research Institute. Analysis of focus group transcripts resulted in 32 themes related to developing subordinate leaders. Through comparing and aggregating these codes, the initial 32 codes were collapsed into six higher-order categories (i.e., establishing positive climate, building subordinate capabilities, inspiring subordinates, caring for Soldiers, managing teams, and leader self-development). Leader processes identified by interviewees are congruent with a strengths-based approach and are consistent with other leader competency models. In particular, providing feedback, identifying strengths and weaknesses, taking care of Soldiers, utilizing subordinates' strengths, and empowering subordinates are widely used leader development strategies that are also supported by strengths-based leadership theory. The benefits gained from utilizing a strengths-based approach to leader development are relevant to the U.S. Army's goal of building adaptable leaders and retaining Soldiers past their initial enlistment or commission. Introducing leaders to the ideas contained within the higher-order leadership processes could produce more motivated, efficient, and satisfied Soldiers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA565315>

TR 1322

Developing Training Exemplars for the Requisite Components of Visual Threat Detection. (2012). Zimmerman, L.A., Mueller, S., Daniels, J., & Vowels, C.L. (DTIC No. ADA565508).

In the first stage of this research, a model of visual threat detection, the threat detection loop, was developed and requisite components of that model were identified (Zimmerman, Mueller, Grover, & Vowels, In Preparation). The primary components of visual threat detection were determined to include dynamic threat monitoring, threat prioritization, and causal reasoning. This second report describes a final quasi-experiment involving those primary components. Results from all of the research informed the development and refinement of a training exemplar that consists of exercises involving each of the components. The exemplar was improved based on feedback from Soldiers with operational experience and from instructors/trainers involved in training threat detection skills.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA565508>

TR 1323

Longitudinal Validation of Non-Cognitive Officer Selection Measures for the U.S. Army Officer Candidate School. (2012). Allen, M.T., & Young, M.C. (DTIC No. ADA565513).

This report provides recommendations regarding the implementation of Army Officer Candidate School (OCS) selection measures for enhancing performance and career continuance. The purpose of the present research was to validate an experimental selection battery called the Officer Background and Experiences Form (OBEF) against long-term (e.g., in-unit performance, service continuance) criterion measures. We collected long-term criterion measures for members of an officer cohort that had completed the OBEF upon entry into OCS in 2008. The pattern of results suggests that the OBEF was predictive of key performance and continuance outcomes approximately three years after officers received their commission. Moreover, the OBEF demonstrated incremental validity beyond that of the Armed Forces Qualification Test (AFQT). Results from longitudinal analyses showed that officers' attitudes changed over time partially as a function of whether they entered OCS through the in-service or enlistment option programs. Changes in self-ratings of morale also were predicted by the OBEF, and change in morale over time was predictive of staying on active duty service beyond the end of the 3-year Active Duty Service Obligation (ADSO). In addition, self-reported career continuance intentions were positively associated with actual active duty continuance behavior.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA565513>

TR 1324

Officer Individual Differences: Predicting Long-Term Continuance and Performance in the U.S. Army. (2012). Zaccaro, S.J., Gilrane, V.L., Robbins, J.M., Bartholomew, L.N., Young, M.C., Kilcullen, R.N., Connelly, S., & Young, W.Y. (DTIC No. ADA566745).

This project investigated individual differences in knowledge, skills, abilities, and personality traits as contributors to long-term career continuance and performance. The research was done to help inform the implementation of new officer selection tests. This effort built upon an existing dataset consisting of test scores from an extensive test battery administered to Army officers in 1992 and 1993. Long-term criteria (i.e., career continuance and highest rank achieved) were retrieved from the Officer Longitudinal Research Data Base (OLRDB), which contained officer personnel records updated through FY 2008. Several individual difference measures were found to predict long-term officer continuance and advancement, such as: complex problem solving, creative thinking skills, tolerance for

ambiguity, and responsibility. These findings will help inform ARI's ongoing research efforts to develop new selection tests for officer candidates that enhance officer career continuance and performance. Particular attention should be directed at measures of complex problem solving and creative thinking skills as these were found to be efficient predictors of the criteria of interest. In addition, these cognitively based selection tools may be supplemented with social, motivational, and personality measures.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA566745>

TR 1325

Tier One Performance Screen Initial Operational Test and Evaluation: 2011 Annual Report. (2013). Knapp, D.J., & LaPort, K. (DTIC No. ADA569024).

Along with educational, medical, and moral screens, the U.S. Army uses a composite score from the Armed Services Vocational Aptitude Battery (ASVAB), the Armed Forces Qualification Test (AFQT), to select new Soldiers. Although the AFQT is useful for selecting new Soldiers, other personal attributes are important to Soldier performance and retention. Based on previous U.S. Army Research Institute (ARI) investigations, the Army selected one promising measure, the Tailored Adaptive Personality Assessment System (TAPAS), for an initial operational test and evaluation (IOT&E), beginning administration to applicants in 2009. Criterion data are being compiled at 6-month intervals from administrative records, from schools for selected military occupational specialties (MOS), and from Soldiers in units. This is the fourth in a series of planned evaluations of the TAPAS, and the first to include in-unit criterion data. Similar to prior research, the cumulative results thus far suggest that several TAPAS scales significantly predict a number of criteria of interest, indicating that the measure holds promise for both selection and classification purposes.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA569024>

TR 1326

Transforming Effective Army Units: Best Practices and Lessons Learned. (2013). Conrad, T.M., Bryson, J.J., Crabb, B.T., & Riley, R.P. (DTIC No. ADA585840).

The research produced lessons learned and best practices for transforming units across the relevant doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) and cultural domains, as well as shares strategies for resolving operational requirements with limited personnel. A review of military, business, and behavioral research literature served as a foundation for the research on lessons learned. Interviews were conducted with reserve and active duty Stryker leaders to further explore the issues associated with transformation. A total of 62 lessons learned or best practices regarding Culture, Personnel, Organization, Leadership and Education, and Training were derived from the literature and interviews. The focus groups identified 20 operational needs where strategies for selecting and training can effectively build necessary unit capabilities. The findings contributed to the development of four products: a matrix for identifying when specific issues will be encountered, a glide path for transformation best practices, a smart card for culture change, and matrix of strategies for resolving new operational needs.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA585840>

TR 1327

Far Transfer of Leadership Training: Concepts, Experiences, and Applications. (2013). Graves, T.R., Pleban, R.J., Mundell, Z., & Perdomo, B. (DTIC No. ADA578564).

Military research on training transfer has tended to focus on near transfer (i.e., measuring trainees' recall of what they have learned). In this study, our focus is on far transfer, which is concerned with whether and how trainees use what they learn. We investigated how graduates of the U.S. Military Academy Platoon Leader 300 (PL300) course described their experiences of using what they learned in PL300 in everyday settings and in field exercises; that is, how they perceived the process of transferring to other settings the knowledge and skills they learned in the course. We were interested in cadets' experiences using what they learned to address problems encountered in everyday settings. In the first phase, cadets (N=494) who completed PL300 were asked to list key PL300 concepts. Lists were analyzed using word frequency and clustering techniques. In the second phase, cadets (N=87) were asked to describe situations in which they had used what they learned in PL300 (2-15 months after PL300). Based on their written descriptions, a thematic framework was developed. The framework was used to develop the Leadership Knowledge Application Scale (LKAS). In the third phase, LKAS was administered to cadets (N=124) completing summer field exercises (10-20 months after PL300). Particular themes emerged with respect to how PL300 knowledge and skills were used in the field

exercises to address different types of leadership problems. The framework and LKAS may be used to enhance far transfer of leadership training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA578564>

TR 1328

Validation of the Noncommissioned Officer Special Assignment Battery. (2013). Horgen, K.E., Nye, C.D., White, L.A., LaPort, K., Hoffman, R.R.III, Drasgow, F., Chernyshenko, O.S., Stark, S., & Conway, J.S. (DTIC No. ADA578567)

This report describes research on noncognitive measures for screening Army recruiters with potential application to other Noncommissioned Officer (NCO) assignments. One limitation has been that previously validated instruments for this purpose required proctored testing. To make it easier for Soldiers to be tested, reduce costs, and build upon previous work, ARI was requested to assist with the following: (1) developing a computerized, noncognitive measure suitable for unproctored administration; and (2) validating this instrument against measures of recruiter performance. This new instrument is called the Noncommissioned Officer Special Assignment Battery (NSAB). The NSAB is a computer-adaptive, forced-choice assessment that incorporates recent advances in noncognitive measurement that have been shown to be highly faking resistant and suitable for high-stakes testing environments. The NSAB has 18 scales. Results from a sample of 1,032 experienced Army recruiters indicated that Soldiers with high NSAB composite scores reported the following: (1) lower job stress, and (2) higher satisfaction with recruiting duty. These high-scoring recruiters also were rated by their peers and supervisors as performing better than recruiters with lower NSAB composite scores. These findings indicate that the NSAB can help to identify Soldiers with high potential for recruiting duty success, and it also has the potential for screening in other NCO assignments.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA578567>

TR 1329

Improving Visual Threat Detection: Research to Validate the Threat Detection Skills Trainer. (2013). Zimmerman, L.A., Leins, D.A., Marcon, J., Pearlman, B., Singer, J.T., Mueller, R., & Vowels, C.L. (DTIC No. ADA585432)

The purpose of this research was to validate a threat detection skills trainer developed in previous research (Zimmerman, Mueller, Daniels, & Vowels, 2012; Zimmerman, Mueller, Grover, & Vowels, in preparation). The trainer consists of exercises intended to improve visual threat detection, including dynamic threat monitoring, threat prioritization, and causal reasoning (Zimmerman et al., 2012). The current research utilized four tasks to measure the impact of the skills trainer: time and resource limited threat search; dynamic change detection; situation awareness at the perception and comprehension levels; and, scenario-based causal reasoning. Findings did not provide evidence that the trainer alone is a viable option for training visual threat detection, likely due to low statistical power and practice effects. However, all participants showed improvement on all dependent variables from pre-test to post-test, suggesting that acute, cognitive training could enhance the skills required for effective threat detection. Future research should tease apart the effects of practice and the effects of training via the threat detection skills trainer. Additional future experiments should test threat detection in live and simulated scenarios to increase ecological validity. Longitudinal research would determine if practice and training on visual threat detection have long-term effects.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA585432>

TR 1330

Learning Technology Specification: Principles for Army Training Designers and Developers. (2013). Swanson, L., Ratwani, K.L., Holland, S.J., Zeidman, T., Bickley, W.R. (DTIC No. ADA591798).

To achieve the technology goals for the Army Learning Model (ALM), there is a need for a set of guidelines that will support training designers and developers in identifying and effectively incorporating new learning technologies into training. Such technology specification guidelines and principles must support the goals of the ALM by taking into account technology effectiveness for training across various environments, ranging from traditional schoolhouse courses to more dynamic operational environments. Thus, Army training development must include a process to support the selection of learning technology that is compatible with the training environment, pedagogically appropriate, and cost effective. This report describes the development of a principled technology specification process that enables training developers to comprehensively consider various aspects of training. The process, driven both by sound scientific principles on how best to integrate technology into training and operational reality, contains three main factors: Learning Requirements, Technology Attributes, and Resources and Constraints. The

process guides the user through considerations within each of those factors to facilitate critical thinking about the technology so that it will best meet learning needs within the ALM.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA591798>

TR 1331

Transferring from the Simulator to a Live Robotic Environment: The Effectiveness of Part-Task and Whole-Task Training. (2013). McDermott, P.L., Carolan, T.F., Fisher, A., Gronowski, M.R. Gacy, A.M. (DTIC No. ADA592596).

Part-task training methods are widely used in training when the full target task is considered too complex or impractical for training as a whole task. However, part-task training has had mixed success in transfer to the whole task. Limited research has focused on part tasks that do not interact but are performed concurrently in the whole task. The present research was designed to help address this gap in the context of an Army-relevant task and training situation: teleoperating a robotic device to detect and identify vehicles. The experiment involved training in a simulated environment and transfer to performance with a live robotic system. Training methods included part- and whole-task training in the simulation environment and part-task training in the live environment. Results indicated a significant benefit in vehicle mobility skills for the condition receiving part-task training both in the simulated and live environment. Participants in this training condition also reached transfer performance criteria in fewer scenarios, and the benefit to mobility persisted in the final freeform scenario. Additionally, part-task training in the live environment, prior to the transfer scenarios, was more efficient than other conditions, resulting in less time spent training on the live robotic system.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA592596>

TR 1332

Tier One Performance Screen Initial Operational Test and Evaluation: 2012 Interim Report. (2013). Knapp, D.J. & LaPort, K. (DTIC No. ADA591889).

In addition to educational, medical, and moral screens, the U.S. Army relies on a composite score from the Armed Services Vocational Aptitude Battery (ASVAB), the Armed Forces Qualification Test (AFQT), to select new Soldiers. Although the AFQT is useful for selecting new Soldiers, other personal attributes are important to Soldier performance and retention. Based on previous U.S. Army Research Institute (ARI) investigations, the Army selected one promising measure, the Tailored Adaptive Personality Assessment System (TAPAS), for an initial operational test and evaluation (IOT&E), beginning administration to applicants in 2009. Criterion data are being compiled at 6-month intervals from administrative records, from schools for selected military occupational specialties (MOS), and from Soldiers in units. This is the fifth in a series of planned evaluations of the TAPAS. Similar to prior research, the cumulative results thus far suggest that several TAPAS scales significantly predict a number of criteria of interest, indicating that the measure holds promise for both selection and classification purposes.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA591889>

TR 1333

Preparing Brigade Combat Team Soldiers for Mission Readiness Through Research on Intangible Psychological Constructs and their Applications. Phase 2: Measurement and Learning Methods. (2014). Aude, S.N., Keller-Glaze, H., Nicely, K., Shuffler, M., & Vowels, C.L. (DTIC No. ADA596910).

The first report of this research focused on identification of psychological constructs relevant for operational units. This second report covers Phase II of the research and is focused on instrument development and effective learning methods. Both academic and military literary sources were examined and Soldiers and leaders from operational units were interviewed to assist in the accomplishment of Phase II objectives. The literature review and feedback from Soldiers assisted in the design and refinement of measures developed to support assessment of psychological constructs essential for Soldier mission readiness. Key findings included the identification of existing training events where the opportunity exists to train and measure intangibles. Unit events such as combat training center exercises and well-planned field exercises were often identified by Soldiers and leaders where intangibles are likely to be exhibited and provide an opportunity to further train the critical intangibles. See also ARI Technical Report 1336.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA596910>

TR 1334

Best Practices and Provisional Guidelines for Integrating Mobile, Virtual, and Videogame Based Training and Assessments. (2014). Brusso, R.C., Wisher, R.A., Paddock, A. & Hatfield, J. (DTIC No. ADA596660).

The Army needs guidance on how to use and integrate assessments and various learning technologies to achieve and support the principles set forth in the Army Learning Model. In an initial step to provide best practices, a literature review and interviews were conducted with subject matter experts to find exemplars within the U.S. Army, other U.S. Armed Services, or other nations? Armed Forces, and the private sector in which training and assessment has been carried out operationally using the following platforms: mobile devices, virtual worlds, and videogame-based scenarios. From the literature review, three exemplars and 23 exemplary elements were found. The exemplars and exemplary elements, along with insights from the interviews, were analyzed to identify several best practices and guidelines for training and assessment development. Given the infancy of the research in this area, however, the practices and guidelines identified can only be considered provisional until more evidence can be gathered.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA596660>

TR 1335

Framework for Instructional Technology: Methods of Implementing Adaptive Training and Education. (2014). Durlach, P.J., & Spain, R.D. (DTIC No. ADA597411).

In adaptive instructional environments, instructional interventions and/or content are adapted to an individual learner's competence level, goals, or other characteristics. The intention behind adaptation is to maintain the optimal level of challenge for each individual student, to provide support, and to correct misconceptions. This report provides a framework in which to consider various technology-based adaptive instructional techniques. The Framework for Instructional Technology (FIT) lays out four categories of adaptive techniques: Corrective Feedback, Support, Micro-sequencing, and Macro-sequencing. Under each category, FIT specifies five levels or approaches to adapting that correspond to degree of adaptive sophistication and complexity of implementation. With few exceptions, evidence supporting the use of higher levels of adaptation is lacking. This is because the systematic comparison of different implementation approaches has not been conducted. The report provides recommendations for combining different levels of FIT with different levels of interactive multimedia instruction. FIT can be used to clearly describe adaptive behaviors and to guide future research investigating the efficacy of different adaptive instructional interventions.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA597411>

TR 1336

Preparing Brigade Combat Team Soldiers for Mission Readiness Through Research on Intangible Psychological Constructs and their Applications: Phase I. (2014). Aude, S.N., Bryson, J.J., Keller-Glaze, H., Nicely, K., & Vowels, C.L. (DTIC No. ADA597445).

This research consisted of two phases. In the initial phase, covered in this report, emphasis was placed on identification of psychological constructs that were determined to be critical for operational units as they prepared to deploy. To support the research objectives, a comprehensive literature review including academic and military sources was conducted and approximately one hundred Soldiers and leaders were interviewed. Several meta-constructs were identified, each of which had multiple sub-constructs embedded within them. Interviews with Soldiers and leaders assisted in reducing the list to those intangibles most critical to mission readiness and identifying training gaps related to the criticality and effectiveness of the relevant intangibles. This identification assisted the second phase of this research that focused on instrument development and identification of effective learning methods; the second phase is covered in a second report. See also ARI Technical Report 1333.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA597445>

TR 1337

Macroscopic Neural Theories of Cognition. (2014). Uttal, W.R. (DTIC No. ADA597175).

This article explores the question, are the available conceptual foundations, the statistical techniques, and the empirical data of cognitive neuroscience sufficiently robust to serve as a foundation for a neuroreductionist explanatory theories of the mind-brain relationship? The answer proposed here is that there is insufficient reason to think that such a theory is likely to emerge in the near future. In this context, a theory means a comprehensive explanation of how cognitive or mental processes are

explained by neural mechanisms. There are two main contenders for this kind of theory building. The first is based on macroneural measurements such as those produced by brain imaging equipment. The alternative is a microneural approach epitomized by the Hebb (1949) Conjecture. The Hebbian approach asserts that it is most likely that cognitive processes of all kinds are mediated by the concurrent collective microneural state (not the summed, pooled, or accumulated macroneural properties) of an assembly of individual neurons. Although there is insufficient evidence at the microneural level to robustly support this conjecture, difficulties with the macroneural approach and the logic of the microneural approach suggest that Hebb was essentially correct. Thus, overarching theories of the mind-brain relation are unlikely in the foreseeable future.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA597175>

TR 1338

Framework for Rapid Situational Awareness in the Field. (2014). Nolan, R., LaTour, E., Klafehn, J.L. (DTIC No. ADA597170).

This report outlines an approach for helping Soldiers to quickly develop situational awareness in unfamiliar cultural situations. Soldiers in the field engage in a variety of non-combat encounters with culturally different individuals, but it is often impossible to prepare Soldiers in advance for the cultural aspects of these encounters, even within a single country. The successful management of these encounters is, however, usually important for overall mission success. Because culture is essentially transactional, cultural differences appear as participants interact. This report describes the essential features of these interactions, as well as the main types of core cultural orientations that play a large role in how individuals approach such interactions. This report also examines situational awareness and how it can be used by Soldiers to promote successful encounters. A framework is presented that combines the components of a typical encounter with the salient characteristics of a number of cultural orientations. The framework is useful for identifying key elements that are likely to affect interactions, and for helping Soldiers learn quickly about them.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA597170>

TR 1339

Identification of Knowledge, Skills, and Abilities for Army Design. (2014). Wolters, H.M., Conrad, T.M., Riches, C., Brusso, R.C., Nicely, K., Morath, R.A., & Keller-Glaze, H. (DTIC No. ADA601309).

The Army Design Methodology is an evolving concept and this research identifies required knowledge, skills, and abilities (KSAs) for leaders and their staffs to effectively use design. Identified KSAs can inform and direct training and leader development that facilitate the application of design and positively impact operational success. This research employed both qualitative and quantitative methods to determine design KSAs. Results support a framework of six competencies and 43 KSA related to the cognitive and social-communication components of design. In order to enhance the development and application of design competencies broadly throughout the force, the Army needs to identify and select Soldiers with a propensity to demonstrate the KSAs, provide them additional developmental opportunities (both inside and outside the classroom), and finally, reward them for engaging in design thinking.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA601309>

TR 1340

Determining the Requisite Components of Visual Threat Detection to Improve Operational Performance. (2014). Zimmerman, L.A., Mueller, S., Grover, J., & Vowels, C.L. (DTIC No. ADA604449).

This report describes research initiated to understand the requisite components of visual threat detection for the operational environment and to assess the critical behaviors Soldiers rely on to proficiently detect threats. To understand the process of visual threat detection, a focused literature review of military doctrine and academic sources was completed, in-depth interviews were conducted with Soldiers who had recent deployment experiences, and computer-controlled exercises were used to investigate the primary processes of threat detection. Those processes include dynamic threat monitoring, threat prioritization, and causal reasoning. Based on findings from that research, a model of visual threat detection was created. The findings are summarized in two reports. This report presents evidence that suggests visual threat detection is a cyclical process requiring numerous, concurrent perceptual and cognitive processes, and may be enhanced by focusing training development on the principle components such as causal reasoning. The second report will discuss the development and evaluation of a research-based training exemplar. Visual threat detection pervades many military

contexts, but is also relevant in similar settings such as law enforcement and airport security; therefore, this research has the potential to inform a wider audience.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA604449>

TR 1341

Understanding the Impact of Training on Performance. (2014). Plott, B., McDermott, P.L., Archer, S., Carolan, T.F., Hutchins, S., Fisher, A., Gronowski, M.R., Wickens, C., & Orvis, K.A. (DTIC No. ADA602128).

This research effort was conducted to collect empirical evidence on the effectiveness of different training methods for acquiring and transferring complex cognitive skills. To accomplish this goal, we conducted a series of meta-analyses (and supplemental experiments) examining six training methods (training wheels, scaffolding, part-task training, increasing difficulty, learner control, and exploratory learning), as well as factors that moderate their effectiveness, such as task/skill type being trained (e.g., perceptual, psychomotor, cognitive-declarative), trainee characteristics (e.g., experience, aptitude), and type of training performance outcome (e.g., learning, transfer). Algorithms were developed to quantify the relationships between the training methods, performance, and the various moderating factors. These algorithms can be used to perform tradeoff analyses to determine the effectiveness of different combinations of training method(s), task/skill types, trainee characteristics, and performance outcomes. Finally, to ensure these research findings and algorithms would be easily consumable by training developers and researchers, a training effectiveness tool was developed, called TARGET (which stands for Training Aide: Research and Guidance for Effective Training). This tool can aid training developers and researchers in making evidence-based decisions concerning the most appropriate training method(s) to use depending on their particular training context; thus, helping to maximize effective learning and transfer.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA602128>

TR 1342

Tier One Performance Screen Initial Operational Test and Evaluation: 2012 Annual Report. (2014). Knapp, D.J., & LaPort, K. (DTIC No. ADA602475).

In addition to educational, physical, and moral screens, the U.S. Army relies on the Armed Forces Qualification Test (AFQT), a composite score from the Armed Services Vocational Aptitude Battery (ASVAB), to select new Soldiers into the Army. Although the AFQT is useful for selecting new Soldiers, other personal attributes are important to Soldier performance and retention. Based on previous U.S. Army Research Institute (ARI) investigations, the Army selected one promising measure, the Tailored Adaptive Personality Assessment System (TAPAS), for an initial operational test and evaluation (IOT&E), beginning administration to applicants in 2009. Criterion data are being compiled at 6-month intervals from administrative records, from schools for selected military occupational specialties (MOS), and from Soldiers in units. This is the sixth in a series of planned evaluations of the TAPAS. Similar to prior research, the cumulative results thus far suggest that several TAPAS scales significantly predict a number of criteria of interest, indicating that the measure holds promise for both selection and classification purposes. The Information / Communications Technology Literacy Test (ICTL) has also been incorporated into the IOT&E. The first evaluation results, which are promising, are presented in this report.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA602475>

TR 1343

Selecting Soldiers and Civilians into the U.S. Army Officer Candidate School: Developing Empirical Selection Composites. (2014). Allen, M.T., Bynum, B.H., Erk, R.T., Babin, N.E., & Young, M.C. (DTIC No. ADA606098).

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) initiated the Measures for Selecting Soldiers for the Officer Candidate School program of research to help select OCS applicants with high leadership potential and likelihood of staying in the Army. The present effort reports results from the third phase of this research. The purpose of this phase was to (a) cross-validate the results from the second phase with a sample of newly accessioned OCS candidates, (b) select the most promising individual instrument for predicting officer performance and continuance, and (c) develop an empirical selection composite. Results suggest that the Phase 2 and Phase 3 samples were quite different on a number of demographic and performance characteristics. Despite these differences, results suggest that the predictive validity for the experimental measures was consistent between Phase 2 and Phase 3. The most promising test measured personality and motivations. Finally, a new set of

composites developed to predict officer performance and continuance demonstrated strong validity that held up in a different sample from the development sample. ARI plans to use these results to prepare the experimental measures for testing in an operational setting.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA606098>

TR 1344

Decision Support Tool Prototype for the Enlistment Incentive Review Board: Phase 2. (2014). Diaz, T.E., Sticha, P.J., Mackin, P.C., Hogan, P.F., Rinde, S., & Jose, I.J. (DTIC No. ADA606096).

The Army offers enlistment incentives--cash bonuses, educational support, and educational loan repayment--to encourage applicants to choose military occupational specialties (MOS) with the greatest need at longer terms of service (TOS). Within the Army, the Enlistment Incentive Review Board (EIRB) determines incentive types, levels, amounts, and qualification criteria as part of its quarterly review process. We had previously developed a job choice model (JCM) to predict applicants' MOS and TOS choices as a function of enlistment incentives. We then implemented the JCM within a proof-of-concept decision support tool (DST). The DST demonstrated the utility of the approach, but had several limitations, which became the focus of the current effort. With the support of the Army Research Institute, we sought to expand the functionality of the DST to produce a viable tool for allocating incentives to meet enlistment goals. To accomplish this goal, we revised the JCM using an expanded choice set, validating it with three different samples. We developed additional models to forecast the effect of economic conditions and recruiting funding on the quality of applicants and to estimate the total cost of the incentives. We then implemented the revised JCM and additional models in a prototype DST.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA606096>

TR 1345

Identifying Dynamic Environments for Cross-Cultural Competencies. (2014). Ratwani, K.L., Beaubien, J., Entin, E.B., Feyre, R.J., & Gallus, J.A. (DTIC No. ADA607189).

The changing focus of military operations from a traditional, kinetic approach to stability and support operations places greater emphasis on the cultural knowledge, skills, and abilities (KSAs) needed for mission success. Given the variability in interpretation and application of such KSAs, a scientific approach is needed to understand what cultural skills are necessary in what situations. In response to that need, Aptima worked with the U.S. Army Research Institute for the Behavioral and Social Sciences to develop frameworks of cross-cultural competencies and contextual attributes. The competency framework developed outlines 15 general cross-cultural competencies needed for effective cross-cultural performance. The contextual attribute framework puts forth seven categories by which to describe the situation surrounding cross-cultural interactions. The frameworks were then used to qualitatively code 334 real examples of cross-cultural interactions in order to map the context to competencies. Results demonstrate that situational characteristics impact the display of cross-cultural competencies. Results from this research can be used to develop training scenarios that are tailored to specific missions and situations. The scenarios can be used to have military personnel analyze the important pieces surrounding a cross-culture interaction and also develop the cross-cultural competencies most likely to be needed within that situation.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA607189>

TR 1346

Delivering Training Assessments in a Soldier Centered Learning Environment: Year 1. (2014). Brusso, R.C., Barnieu, J., Huang, J., Lodata, M.A., Mulvaney, R., Cummings, P., Zoellick, C., Thieme, K., & Spain, R.D. (DTIC No. AD1034442).

The Army Learning Model (ALM) discusses the importance of using valid and reliable assessments in training technologies. It specifically mentions the use of pre-tests to tailor training and post-tests to ensure that learning has occurred to a standard. However, other than these recommendations, the ALM does not address how assessments should be designed, delivered, and otherwise used to maximize Soldier training. Questions regarding which type of assessment should be used, the optimal frequency of assessment and how to automate assessment in collaborative problem-solving scenarios remain to be answered. To address these issues the U.S. Army Research Institute (ARI) developed prototype training that provides a test-bed for conducting research on assessment strategies with maturing training technologies. This paper discusses the development of the prototype training and assessments, including a discussion of the prototype concept, the instructional design approach used to develop the training and corresponding assessments, and the technology considerations and constraints. The paper also describes the results of a beta test that examined the validity and usability of the training platforms

and assessments. It concludes with a discussion of future research, which examines critical questions regarding the design and delivery of assessments within the prototype training.
<http://www.dtic.mil/dtic/tr/fulltext/u2/1034442.pdf>

TR 1347

Assessing Threat Detection Scenarios through Hypothesis Generation and Testing. (2015). Zimmerman, L.A., Leins, D.A., Marcon, J., Mueller, R., Singer, J.T., & Vowels, C.L. (DTIC No. AD1002692).

The purpose of this research was to explore the decision-making processes of Soldiers with different levels of experience as they evaluated scenarios with varying levels of uncertainty. This research focused on understanding the interaction of experience and uncertainty on hypothesis generation and testing, and on the relationship between confidence and decision-making. Soldiers engaged in computer-based exercises that measured decision-making performance in a threat detection task. These exercises involved reading threat-relevant scenarios and then reporting threat decisions. We gained a better understanding as to how Soldiers select and integrate cues in uncertain decision environments involving potential threats by having them complete such exercises. Findings indicated that experienced and inexperienced Soldiers tended to focus on different priority threats (or what they perceived as the most important threats). Experienced Soldiers were likely to report more discrete threats when identifying their priority threat in each scenario. They were also more likely to search information that confirmed their initial hypotheses. Overall, changes in hypotheses appeared to be associated with lower initial confidence ratings. Across experience levels, Soldiers tended to search relevant details more often than irrelevant details. Those findings provide insight into the cognitive processes Soldiers with varying levels of experience use to make threat decisions in certain and uncertain environments.
<http://www.dtic.mil/get-tr-doc/pdf?AD=AD1002692>

TR 1348

Preparing Brigade Combat Team Soldiers for Mission Readiness Through Research on Intangible Psychological Constructs and their Applications: Validation and Pilot. (2015). Aude, S.N., Nicely, K., Lodata, M.A., & Vowels, C.L. (DTIC No. ADA616373).

The U.S. Army Research Institute is developing and piloting measures of Soldier initiative and perseverance to enhance Soldier mental toughness and readiness for their assigned mission set. Potential uses of the measures are to both assess and develop Soldier initiative and perseverance as part of their individual and collective unit training. In the current research, evidence for construct validity was gathered by administering measures of initiative and perseverance to 151 Soldiers. Additional evidence for construct validity and the usability of the measures in the field was obtained by conducting a pilot test with 10 noncommissioned officers serving in positions of acting squad leader during Medical Simulation Training Center training lanes.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA616373>

TR 1349

Best Practices in Military Design Teams. (2015). Grome, A., Crandall, B., Metcalf, K.A., Lauferseiler, D., & Strouse, R. (DTIC No. ADA614103).

This research report offers an integrative view of key challenges that military design teams encounter, and describes lessons, strategies, and approaches used by military leaders to optimize the performance of design teams in operational contexts. Topics include assembling design teams, managing intergroup dynamics, fostering cognitive flexibility, integrating non-military SMEs into the team, capturing the team's evolving understanding, and conveying insights to stakeholders. The report presents findings from previous research on teams as well as insights from interviews and a survey with those who have worked in design teams in operational settings.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA614103>

TR 1350

Development of a Mass Casualty Triage Performance Assessment Tool. (2015). Curnow, C.K., Bryson, J.J., Barney, R.D., Keller-Glaze, H., & Vowels, C.L. (DTIC No. ADA616382).

The overall objective of this research was to develop a prototype measure of performance for a collective task; a more thorough description is provided in Curnow, Barney, Bryson, Keller-Glaze and Vowels (2015). To accomplish the objective, a collaborative effort was initiated with a U.S. Army Forces Command (FORSCOM) Military Police (MP) unit to select a task for metric development and then develop and refine a prototype measure for that task. Through collaboration between the research team

and the unit, a need for measurement development involving the task of mass casualty triage was identified. Thus, we developed an assessment tool designed to measure the degree to which Soldiers could correctly triage injured civilians during a mass casualty training event. Based on a review of military and civilian literature regarding mass casualty triage and interviews with members of the unit, the triage assessment development involved three steps: (1) identification of key functions associated with mass casualty triage; (2) identification and categorization of subtasks for each task; and (3) review and conversion of tasks and/or subtasks into proper task statements. The Mass Casualty Triage Performance Assessment Tool is ARI Research Product 2015-02.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA616382>

TR 1351

Enhancing the Predictive Potential of Personality: Isolating Multiple Components of Trait Expression via a Single Administration Design. (2015). Putka, D.J., Fleisher, M.S., & Beatty, A. (DTIC No. ADA618190).

Decades of research support that people behave differently in different situations. The focus of this research was on advancing the measurement of personality by more careful of consideration of situations. Specifically, this research proposed and evaluated a methodology for assessing multiple components of individuals' expression of their personality traits. These components include elements of personality that are stable across situations and those that vary depending on the particular situation that a person confronts. Historically, most of what the field of psychology knows about links between personality and valued outcomes such as job performance and employee turnover, are based on measures of personality that focus solely on the stable part of trait expression. As such, this research offers the potential to inform the development of personality measures that offer increased potential for predicting outcomes of interest to the Army and other organizations.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA618190>

Research Reports

RR 1746

A Trial Program for Selection to Infantry Training Brigade Company Command. (1999). Matthews, M.D., & Dyer, J.L. (DTIC No. ADA369935).

This research evaluated a trial program in which carefully selected, volunteer senior first lieutenants and junior captains were assigned to U.S. Army Infantry Training Brigade company command prior to completing the Infantry Captains Career Course (ICCC). Pre-ICCC commanders were promised a fellow-on command in an operational unit and served in the ITB command for 11 months, versus the standard 18 months. The job performance, leadership, organizational and training management skills, and turbulence effects of the shorter command tour of captains in the trial program (Pre-ICCC commanders) were compared to captains who assumed command after completing ICCC (Post-ICCC commanders). A combination of surveys and interviews with drill sergeants, battalion commanders, battalion command sergeants major, and the company commanders was conducted. Results showed Pre-ICCC company commanders received as high or higher ratings than Post-ICCC commanders. Turbulence effects were rated as minimal to moderate and were minimized by various management techniques. Battalion commanders spent relatively greater time developing Pre-ICCC commanders, but the Pre-ICCC commanders' great enthusiasm and motivation compensated for their lack of experience.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA369935>

RR 1747

The Changing U.S. Army: A Summary of Future Focused Reports from 1990 — 1999. (1999). Zaccaro, S.J., Klimoski, R.J., & Boyce, L.A. (DTIC No. ADA371558).

This report briefly summarizes a review of 83 documents that focused on how the Army and its environment might be changing in the future, and what these changes could mean for leadership practice, leadership development, and other important organizational policies. The reports and presentations reviewed were prepared from 1990-1999 with the majority written over the last three years. These documents were reviewed to answer two central questions: (1) What is the Army's operating environment likely to be in the future? and (2) What do environmental changes mean for leadership practices and leader development? The review of the 83 reports indicated significant changes in six environmental sectors: geopolitical, technological, economic, socio-cultural, and demographic. The results of the review are organized around four topics: (1) leadership performance requirements resulting from changes in the Army's operating environment; (2) the leader attributes that contribute to leader effectiveness; (3) the assessment and selection of Army officers; and (4) the training and development of officers. The resulting summary was prepared in the form of a briefing to be presented to senior decision makers. This report includes the summary, list of reports reviewed, and briefing slides.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA371558>

RR 1748

Force XXI Training Program-Digital Project: Report on Development and Lessons Learned. (1999). Graves, C.R., Pratt, D.M., Campbell, C.H, Allen, J.D., Thorson, K.G., Jenkins, S.N., & Quinkert, K.A. (DTIC No. ADA371065).

This report discusses the Army's initial research into converting Force 21 Training Program (FXXITP) products to meet the increasingly pressing training needs of digital battle staffs. The report describes the activities and outcomes of the U.S. Research Institute for the Behavioral and Social Sciences (ARI) Force 21 Training Program Digital (FXXITP-D) project. The project developed an approach that supports the conversion of existing training products in order to meet new training needs. During the project, the conversion approach was employed to research and enact conventional to digital conversions of selected FXXITP products, including the Battle Staff Training System (BSTS) and Combined Arms Operations at Brigade Level, Realistically Achieved through Simulation (COBRAS) vignettes, Brigade Staff Exercise (BSE), and Brigade and Battalion Staff Exercise (BBSE). In addition to the conversion approach and prototype digital training products, the project identified a number of lessons for the continuing development of digital training and the digital force.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA371065>

RR 1749

Training Lessons Learned on Sights and Devices in the Land Warrior Weapon Subsystem. (1999). Dyer, J.L. (DTIC No. ADA371583).

The Land Warrior (LW) system is the Army's future system for the individual Soldier. The LW consists of five subsystems, with the weapon subsystem the focus of the training research. The training of two platoons in preparation for a LW operational test was observed. Four sights and devices were trained (the close combat optic, two aiming lights, and the thermal weapon sight), plus a bore light. The training adequately prepared the Soldiers to qualify on the M4 carbine with the close combat optic and the thermal weapon sight. Qualification standards were extremely difficult to achieve with the aiming lights on the M4, due to environmental conditions typical of Army ranges, not to lack of firer expertise. A standardized technique for boresighting all the devices was developed. Diagnostic skills needed by trainers and Soldiers to effectively hit targets with each device were identified. The findings have immediate applicability to the Army, as the devices are currently being fielded. The report describes what contributes to quality training on the devices, and what should be integrated into marksmanship programs of instruction, technical manuals, and the training and doctrine literature.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA371583>

RR 1750

Attrition in the Army from the Signing of the Enlistment Contract through 180 Days of Service. (2000). Fischl, M.A., & Blackwell, D.L. (DTIC No. ADA372717).

This work addressed attrition from the Army's Delayed Entry Program (DEP) and the training phase of enlistment. The sample was the file of all non-prior service Active Army contracts executed in fiscal years 1992 and 1993, tracked in service through fiscal year 1995. Independent variables were all information the Army routinely collects with the signing of enlistment contracts; the dependent variable was the dichotomous attrited or still serving. The total N of 159,649 was divided into two halves. The first half was used to identify independent variables that discriminated the criterion groups, the second half to determine what the effect would be if those variables were used for pre-enlistment screening. Results indicated that AFQT Category IIIB individuals had attrition rates indistinguishable from IIIA scorers; that non-high school diploma graduates continued to be poor attrition risks, except for those who had participated in military youth programs; and that extremely heavy individuals were poor risks. The information was applied to screen holdout group files and construct plots cross tabulating cases which would have qualified or not, by attrited or still serving.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA372717>

RR 1751

The Computer Background of Infantrymen: FY 1999. (1999). Dyer, J.L., & Martin, G.H. (DTIC No. ADA372716).

The research determined the experience Soldiers had with computers, their perceptions of their own skill, and their ability to identify icons representative of those in the proposed Land Warrior software. A survey was given to Soldiers and leaders representing the rank and experience structure of an Infantry rifle platoon, as well as to Infantry platoons. The platoon leaders, the lieutenants who are recent college graduates, had the most computer expertise and were the most homogeneous on the indicators of computer skill in the survey. For the remaining platoon members, the picture was more diverse for both noncommissioned officers and squad members. Although a substantial portion of these groups had computer skills, a substantial portion had very limited skills. If training were to begin today on a digital system used by the rifle platoon, the results indicate that prior and special training on basic computer skills would be required for many of these Soldiers. Although the focus was on the rifle platoon, the results should be typical of other Soldiers throughout the Army of similar ages and ranks. The research will continue in FY00 and FY01 to determine changes in computer expertise in the groups studied.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA372716>

RR 1752

Operational Assessment of Force XXI Training Products: Lessons for Successful Fielding. (2000). Pratt, D.M., Graves, C.R., Campbell, C.H., Detrani, R.L., Leibrecht, B.C., Allen, J.D., Jenkins, S.N., & Quinkert, K.A. (DTIC No. ADA372484).

This report describes the activities and findings of the capstone assessment of the U.S. Army's Force XXI Training Program (FXXITP). The assessment project was titled, Implementation and Support for the Assessment of Force XXI Training Program (ISAT), and focused on the utility of selected FXXITP

products in supporting brigade yearly training, specifically in preparation for National Training Center rotations. The ISAT project outcomes represent a compilation of implementation methods, assessment data and analyses, lessons, and recommendations. The project confirmed the importance of maintaining the currency of training products, and of providing both education and implementation support to units who will use the products. Additionally, the project highlighted the importance of creating flexible training products that can be tailored to the needs of the user.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA372484>

RR 1753

Modeling and Measuring Situation Awareness in the Infantry Operational Environment. (2000).

Endsley, M.R., Holder, L.D., Leibrecht, B.C., Garland, D.J., Wampler, R.L., & Matthews, M.D. (DTIC No. ADA372709).

This report documents the methods and findings of the Infantry Situation Awareness (SA) project, conducted to develop a model and measures of SA for the unique Infantry operational environment. The research team analyzed the complexities of the Infantryman's environment based on the tactical parameters of mission, enemy, terrain, troops, time available, and civilian considerations (METT-TC) at various echelons from the individual Soldier to brigade level. The analysis addressed the key factors influencing SA during various stages of operations. Available models of SA were reviewed, and two were adapted and integrated to account for individual and team SA, respectively, in Infantry operations. In addition, the research team reviewed available measures, both direct and indirect, that can be employed to evaluate individual and team SA in different operational situations and at varying echelons. The advantages, disadvantages, and application considerations for these measures were identified. The report recommends future research requirements to address Infantry SA needs related to modernization initiatives and training development efforts. Finally, the report offers suggestions to senior Army leaders concerning the value of considering SA in the development of equipment, doctrine, and training programs.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA372709>

RR 1754

Analysis of Mission Based Scenarios for Training Soldiers and Small Unit Leaders in Virtual Environments. (2000). Pleban, R.J., Eakin, D.E., and Salter, M.S. (DTIC No. ADA373762).

This report describes a multi-tiered process for generating a set of high payoff tasks that can be cost effectively represented in virtual environments. The tasks were used to guide the development of small unit (squad/team) dismounted Infantry training scenarios which were evaluated at the Dismounted Battlespace Battlelab (DBBL) Land Warrior Test Bed. Scenarios were based on five major tasks, Assault, Move Tactically, Enter Building and Clear a Room, Reconnoiter Area, and React to Contact. Soldiers, working as teams or part of a squad, executed all task-based scenarios through the use of individual combatant simulators. Soldiers indicated that simulations improved their real-world performance on similar tasks. Overall, the simulators were seen as effective for small unit training, e.g., team coordination, communication, decision making. The scenarios which provided the most training value integrated Soldiers with computer generated forces to provide live force-on-force capability. The research showed the potential training value of dismounted infantry simulation technologies for Soldier and small unit training, particularly cognitive-based activities. Subsequent research will focus on the use of this technology to enhance the decision-making skills of Soldiers and small unit leaders.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA373762>

RR 1755

Structured Simulation Based Training Programs: History and Lessons Learned. (2000). Shlechter, T.M., & Finley, D.L. (DTIC No. ADA376389).

This report provides an historical account and analysis of the U.S. Army Research Institute's (ARI) research and development (R&D) efforts on structured simulation-based training (SST). These R&D efforts have led to the development of 30 research reports, 14 conference papers, and over 200 training support packages (TSPs). The developed TSPs focused on optimizing the simulation-based training opportunities for armor and mechanized infantry platoons and companies, and their battalion and brigade staffs. The TSPs have also been developed for representatives of a battalion's or a brigade's combat support and combat service support elements. This report's findings indicate that the developed TSPs would, if utilized properly, help the U.S. Army more fully exploit its advanced simulation-training systems. In addition, 43 lessons learned have been derived from these SST projects. The present report

provides a central information source on ARI's SST efforts, and has important implications for future SST research and development efforts.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA376389>

RR 1756

Combined Arms Structured Simulation Based Training Programs: Reflections of Key Developers. (2000). Finley, D.L., Shlechter, T.M., & Lavoie, M.C. (DTIC No. ADA376715).

A series of research and development programs on structured simulation-based training (SST) were conducted during the period 1993-1999. These programs focused on developing SST training Support packages (TSPs) to meet collective training requirements for the combined arms at echelons of brigade and below. An SST development methodology was also produced. The purpose of the methodology was to support future TSP developments as requirements for them are identified. This report represents the second portion of a two-part examination of issues related to SST. The first report described the history of these programs and their lessons learned. This report presents findings in three areas which were either not directly addressed or insufficiently resolved in published SST reports. These areas are: the respective roles of the constructivism and behaviorism/Systems Approach to Training instructional theories in designing the SST TSPs; needs for additional information and SST-related research; and planning and logistical requirements for integrating and maintaining SST as a part of the U.S. Army training system. The information needed to address these three areas was obtained from structured interviews and questionnaires.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA376715>

RR 1757

Direct Observation in the Conduct of Training Impact Analyses. (2000). Evans, K.L., & Dyer, J.L. (DTIC No. ADA377177).

Important training issues are sometimes not considered when examining the relative merits of competing candidates for an operational system requirement. This is particularly true early in the product development cycle. To address this concern, training impact analysis methods were developed and implemented within the context of an Operational Test (OT) of antitank weapon systems and an Advanced Concept Technology Demonstration (ACTD) of off-the-shelf technologies for urban operations. Data collected were predominately observational, consisting of time-referenced specimen records documented sequentially within their naturally occurring context. These data were used to identify and compare the tasks Soldiers had to learn and perform with different candidate systems. Subjective judgments were made about the relative complexity and difficulty of tasks across systems. Relative to a baseline technology or predecessor system, each candidate was ultimately judged to have either a positive, neutral, or negative potential impact on the institutional and unit training base. Training impact rankings of systems were based on the relative numbers of tasks involved, the relative complexity and difficulty of each task, and the relative levels of training resources needed to achieve operational proficiency. Finally, several potential uses of training impact information are suggested.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA377177>

RR 1758

Summary of Recommendations for Successful Fielding of Force XXI Training Products. (2000). Campbell, C.H., Pratt, D.M., Graves, C.R., & Quinkert, K.A. (DTIC No. ADA378082).

This report summarizes the activities and findings of the capstone assessment of the U.S. Army's Force XXI Training Program (FXXITP). The assessment project was titled, Implementation and Support for the Assessment of Force XXI Training Program (ISAT), and focused on the utility of selected FXXITP products in supporting brigade yearly training, specifically in preparation for National Training Center rotations. The ISAT project outcomes represent a compilation of implementation methods, assessment data and analyses, lessons, and recommendations. The project confirmed the importance of maintaining the currency of training products, and of providing both education and implementation support to units who will use the products. Additionally, the project highlighted the importance of creating flexible training products that can be tailored to the needs of the user. A companion report, entitled Operational Assessment of Force XXI Training Products: Lessons for Successful Fielding (Pratt et al., 2000) discusses the background of the ISAT project and documents project activities and outcomes in more detail.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA378082>

RR 1759

The Commanders' Integrated Training Tool for the Close Combat Tactical Trainer 2: Second Generation Design and Prototype Development. (2000). Gossman, J.R., Bonnett, M., Forrest, D., Shadrick, S.B., Dannemiller, B., Flynn, M.R., Mauzy, R.P., & Bonnett, M. (DTIC No. ADA379049).

This report describes the continued design and prototype development of the Commanders' Integrated Training Tool (CITT) for the Close Combat Tactical Trainer (CCTT), a system of armored vehicle manned-module simulators and workstations that allows units to train collective armor and infantry tasks at the platoon through battalion task force level. This project was a follow-on to the initial Cull project completed in, 1999 which produced the design and a prototype software application and Web Site to provide unit commanders and other unit trainers with comprehensive information on CCTT and on structured training along with the ability to produce exercise Training Support Packages. The current project expanded the Cull design and prototype to include additional terrain databases, information and exercises for Force XXI Battle Command Brigade and Below (FBCB2) units, and the integration of CITT with CCTT Exercise Initialization Tool (CEIT). Near-, mid-, and long-term implementation strategies and fielding plans were developed and are presented along with lessons learned and recommendations for future actions.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA379049>

RR 1760

Factors Affecting the Career Decisions of Army Captains. (2000). Matthews, M.D., & Hyatt, J.R. (DTIC No. ADA380929).

Army captains were interviewed to determine factors that affect their- career-decisions. Seventeen Fort Benning captains who had submitted their paperwork to separate from the Army ("leavers"), 15 Fort Benning captains who planned to remain in the Army ("stayers"), and 15 captains from four Infantry posts who had separated from the Army but had recently returned to active duty ("returners") were interviewed. Because the majority of those interviewed were assigned to Fort Benning, the generality of the results to the Army as a whole are limited. However, job dissatisfaction/frustration, family issues, and the perception of strong civilian job opportunity were the main reasons captains left. Pay and benefits were not among the top factors mentioned. Leavers also were less satisfied with their degree of intrinsic job satisfactions and chances for advancement than stayers or returners. Stayers and returners valued the intrinsic qualities of Army work and life. Suggestions for improving captain retention include earlier and more meaningful mentoring of junior officers, giving officers more control in the job assignment process, and better management of operational tempo (OPTEMPO).

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA380929>

RR 1761

Basic Rifle Marksmanship Training with the Laser Marksmanship Training System. (2000). Hagman, J.D. (DTIC No. ADA380109).

This research compared the relative impact of two approaches for training Basic Rifle Marksmanship (BRM). One hundred and eighty four One-Station Unit Training (OSUT) infantry trainees (i.e., the experimental group) trained under a U.S. Army Reserve (USAR)-developed, device-based (i.e., the Beamhit Laser Marksmanship Training System LMTS) approach, and 202 infantry trainees (i.e., the control group) trained under the standard U.S. Army Infantry School BRM program of instruction. Results revealed that the experimental group outperformed the control group on shot grouping, weapon zeroing, and known-distance firing. No between-group differences were found, however, for record fire qualification scores or for performance during pop-up target engagement practice periods leading up to qualification. The implications of these findings for initial marksmanship training are discussed along with plans for follow-up USAR-sponsored research to assess (a) the impact of LMTS-based training on sustainment performance, and (b) the feasibility of using LMTS-based performance to predict live-fire qualification scores.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA380109>

RR 1762

The Computer Background of Soldiers in Infantry Courses: FY 1999 — FY 2000. (2000). Fober, G.W., Bredthauer, J.L., & Dyer, J.L. (DTIC No. ADA381507).

The research determined the experience Soldiers had with computers, their perceptions of their own skill, and their ability to identify commonly used icons. A survey was given to Soldiers attending Infantry courses during FY99 and FY00. The report documents the FY00 results and compares them to FY99

results. The Soldiers' ranks mirrored the structure of an Infantry rifle platoon. Lieutenants, most being recent college graduates, had the greatest computer expertise and were the most homogeneous on the indicators of computer skill in the survey. For the remaining Soldiers, the picture was more diverse for both noncommissioned officers and junior enlisted members. A substantial portion of these groups had computer skills, but many had very limited skills. Based on these results, training on basic computer skills may be necessary prior to advanced training on digital systems used by rifle platoons. Although computer skill level for these Soldier populations remained stable from FY99 to FY00, computer ownership increased. Because many Soldiers indicated learning computer skills on their own, the increased percentage of Soldiers owning computers may eventually translate to higher skill levels. The research will continue in FY01 to determine changes in computer expertise in the groups studied.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA381507>

RR 1763

Refinement of Prototype Staff Training Methods for Future Forces. (2000). Deatz, R.C., Greene, K.A., Holden, W.T., Throne, M.H., & Lickteig, C.W. (DTIC No. ADA383380).

This report documents the design, development, and implementation of refinements to a prototype staff training package for future forces. These training refinements were made to a prototype staff training package described in the report *Prototype Staff Training and Evaluation Methods for Future Forces*, Throne et al., 1999. The training refinements were implemented in a simulation-based experiment examining the impact of digital systems on Future Battle Command at the battalion and brigade level. This report focuses on the training support package designed to improve performance of staffs using advanced command, control, communications, computer, and intelligence (C4I) systems. Documentation is provided on the analysis, design and development of four staff training products developed under this effort: a Surrogate Command, Control, Communications, and Computers (SC4) System Demonstration, Digital Staff Drills, Team Training Sessions (TTSS) and TTSS Trainer Guide, and refinements to Tactical Decision-Making Exercises (TDXs). The formative evaluation is described for those products with survey results and project team Observations reported by product type. Lessons learned on future staff training are documented and may help direct the Army's effort to develop command and staff training support packages (TSPs) for future forces.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA383380>

RR 1764

Refinement of Prototype Staff Evaluation Methods for Future Forces: A Focus on Automated Measures. (2000). Throne, M.H., Holden, W.T., & Lickteig, C.W. (DTIC No. ADA384027).

This report examines the use of digital information systems and automated measures of human performance to improve staff training and performance assessment. This work began with a review of research literature and technical documentation related to team performance and assessment, operations in digital environments, and automated performance data collection. A general design for staff performance assessment was formulated, based on findings of the literature review. An opportunity to implement this design was provided by an Army Concept Experimentation Program (CEP), the Battle Command Reengineering (BCR) IV, which took place in 2000. By participating in the BCR IV, researchers had the opportunity to conduct a trial implementation of the automated measures of performance assessment. Coordination between the U.S. Army Research Institute for the Behavioral and Social Sciences and the Mounted Maneuver Battlespace Lab (MMBL) at Fort Knox, Kentucky, enabled the two organizations to work together as a team to accomplish multiple goals. This report describes the development of prototype automated measures, the results of their use during the BCR IV, and lessons learned for future staff performance assessment efforts.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA384027>

RR 1765

Special Forces 2000: A Report from the Field. (2001). Zazanis, M.M., Sanders, M.G., & Carpenter, T.D. (DTIC No. ADB264775 / Restricted).

RR 1766

Developing an Army Market Research Index in Support of Army Recruiting. (2001). Morath, R.A., Light, E., Gompper, N., Harris, J., & Zazanis, M.M. (DTIC No. ADA389574).

A strong economy in recent years has increased the challenge that Army recruiters face in obtaining sufficient enlistees to meet force requirements. In order to continue to meet recruiting goals, the Army must understand youth perceptions and how youth make decisions about whether to join the Army.

Generating appropriate market research for the Army requires first cataloguing the existing market research databases and identifying the critical questions that are not answered by current research. This effort identified existing databases that have information about youth and parent attitudes and developed a searchable electronic catalogue of these databases. For each of 64 databases identified, researchers acquired information such as the sample size, demographics of the subject population, the type of variables in the research, frequency of data collection, cost of obtaining the data, and point of contact information. An index was created that can be searched either using 17 relevant search categories or by a user-defined key word search. Recommendations for future research directions are discussed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA389574>

RR 1767

Training and Assessment of Decision Making Skills in Virtual Environments. (2001). Pleban, R.J., Eakin, D.E., Salter, M.S., & Matthews, M.D. (DTIC No. ADA389677).

This report describes a preliminary research effort to: (1) determine the effectiveness of using a virtual environment to train real world decision-making skills; (2) examine the feasibility of using a virtual environment as a test bed for developing situation awareness (SA) measurement instruments and; (3) empirically assess the role of SA in decision-making in simulated dismounted infantry environments. Seven experienced and seven inexperienced officers, role-playing a dismounted infantry platoon leader, individually conducted four urban operation scenarios (missions) in a virtual environment setting. Decision-making capability and SA were assessed for each mission. Objective decision-point accuracy improved significantly over missions. Level of experience did not impact the rate of learning. Experience did play a significant role in SA assessments. Selected SA measures also predicted a significant portion of the variance in objective decision-point scores. The research showed that real world decision-making skills could be trained using virtual environment technologies. To insure maximum benefit, virtual training must be combined with the appropriate field experience and mentoring. Conducting research in a controlled virtual environment setting permitted closer empirical scrutiny of the linkage between decision-making and SA in dismounted infantry operations and suggested new directions for further work in these areas.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA389677>

RR 1768

The Virtual Sand Table: Intelligent Tutoring for Field Artillery Training. (2001). Wisher, R.A., Macpherson, D.H., Abramson, L.J., Thornton, D.M., & Dees, J.J. (DTIC No. ADA388158).

This report examines the application of an intelligent tutoring system (ITS) for use in training a complex skill during the Field Artillery Captains Career Course. Based on a technology transfer agreement between the U.S. Army Training and Doctrine Command and the U.S. Army Research Institute for the Behavioral and Social Sciences, an ITS originally developed for the Navy was adapted for use in a sand table exercise. The exercise required students to deploy multiple launch rocket system assets during a reconnaissance and selection of position task. The task was conventionally taught using miniature replications of vehicles and launchers on a large table of sand. An ITS version of the exercise, called the Virtual Sand Table, replicated the training with the added advantage of informative feedback and computer-based coaching during the exercise. A comparison group (n=209) used the conventional sand table and the treatment group (n=105) used the Virtual Sand Table during a four-hour training exercise. Results, as measured by a hands-on performance test, indicated superior performance by the Virtual Sand Table treatment group, with an effect size of just over one standard deviation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA388158>

RR 1769

Analysis of the USAREC Recruiting Incentive, Partnership for Youth Success as Viewed by the Big — 3 Companies of the Automotive Industry. (2001). Elton, R.M., Benchoff, D.L., & Bemis, A.H. (DTIC No. ADA389686).

The Partnership for Youth Success (PaYS) is a new USAREC formulated recruiting incentive designed to appeal to high school seniors and graduates who would rather enter the workforce than attend college at the end of their initial term of Army service. The purpose of the present study was to present a briefing on the particulars of the PaYS program to officials of the Big-3 automakers to determine the views of a homogeneous industry segment concerning the perceived strengths and weaknesses of the program as currently structured. This research was designed to offer all feedback gathered to the program's proponent for possible modification of the program to maximize its value as a recruiting

incentive. An analysis of the feedback from the Human Resources Directors of Daimler-Chrysler, General Motors, and Ford as well as an official of the UAW indicated a uniform and consistent view that, while interested in employing former Soldiers, the companies could not participate in the PaYS program as currently structured. Possible modifications of the program are provided as recommendations along with a possible protocol to be conducted on the target market by an appropriate survey agency to determine the extent of interest in the PaYS program as a significant recruiting incentive.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA389686>

RR 1770

Measures of Platoon Leader Situation Awareness in Virtual Decision Making Exercises. (2001). Strater, L.D., Endsley, M.R., Pleban, R.J., & Matthews, M.D. (DTIC No. ADA390238).

This report documents an effort to investigate the situation awareness (SA) requirements for platoon leaders in a Military Operations on Urbanized Terrain (MOUT) environment. Subject matter experts with extensive infantry experience participated in a goal-directed task analysis to identify the SA requirements of platoon leaders at three levels: Level 1-perception, Level 2-comprehension, and Level 2-projection. From this analysis, objective and subjective SA measurement instruments were developed. Experienced and inexperienced officers engaged in four simulated missions in the Squad Synthetic Environment and responded to questions during halts in the simulation. Two instruments, the Situation Awareness Global Assessment Technique (SAGAT), a PC-based objective family of queries, and the Situation Awareness Behaviorally Anchored Rating Scale (SABARS), a subjective observer-rated instrument, both showed sensitivity to experience levels. The SAGAT scales also displayed sensitivity to the type of scenario and the point in the simulated mission at which the halt occurred. Officers with greater experience attended more to information about enemy locations and strengths, while less experienced officers attended more to information concerning friendly strengths. This has some intriguing implications for training new officers, but further investigation of these SA findings is necessary.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA390238>

RR 1771

Commanders' Survey: Armor Captains' Career Course: Distance Learning. (2001). Sanders, W.R., & Guyer, C.W. (DTIC No. ADA390166).

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) Armored Forces Research Unit (AFRU) at Fort Knox supports the U.S. Army Armor School (USAARMS) by conducting training research and development. The USAARMS has recently introduced a revised Armor Captains' Career Course (AC3) delivered primarily through Distance Learning (DL). In 2000, the Director of the USAARMS requested that the AFRU provide Technical Advisory Service in the development and evaluation of a survey of both students and leaders involved with AC3 DL. This report describes the results of the survey developed to gather information regarding factors limiting participation in the AC3 DL course to include Reserve Component policies, monetary and no-monetary incentives, course impact on the student's other unit responsibilities, and factors contributing to student attrition. This report examines both course content and Reserve Component policies impacting distance learning time requirements and computer equipment support. Results of the survey were briefed to the Director of the USAARMS, and the Director of Training, National Guard Bureau in 2000.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA390166>

RR 1772

Assessing and Managing User Produced Training Support Packages. (2001). Gossman, J.R., Graves, C.R., Mauzy, R.P., Clagg, R.A. (DTIC No. ADA390420).

This report describes the conduct and results of a project to examine assessment and management of user-produced training support packages (TSPs) for collective training exercises in live, virtual, constructive, and combined training environments for combat arms organizations at brigade and below at present and for the next five years. User-produced refers to TSPs that are developed by unit commanders and other unit trainers as well as institutional trainers who will be directly involved with executing the exercises they produce. The major research activities consisted of: data collection, data analysis, and development of products to fulfill the project objectives. A major focus of data collection was coordinating with the ongoing development of the Army Training Information Architecture which will establish a framework within which the products of the current project will fit. The project produced the following: a process for identifying core set exercises for combat arms units; the list of components and elements of a TSP for collective training exercises identified to a level sufficient to develop database

specifications for them; recommendations for TSP assessment, approval, and distribution; and an identification of six types of users of TSPs along with their roles in exercise execution.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA390420>

RR 1773

Cognitive Psychology Principles for Digital Systems Training. (2001). Sanders, W.R. (DTIC No. ADA391035).

As the Army transitions to modern digital technology it faces a major challenge in designing computer-implemented training to support the acquisition, retention, and transfer of skills required to operate these systems. This report describes principles of cognitive psychology and related training techniques that can be incorporated into the design of computer-implemented training. While modern computers and the Internet offer technically advanced capabilities, the training potential of these systems comes from their ability to vary instructional methods and media systematically according to the cognitive demands of the tasks to be trained. The research described in this report builds on previous ARI skill retention research accomplished with the Army's Inter-Vehicular Information System (IVIS), where it was noted that a number of cognitive psychology principles might be applied to modify training to enhance skill retention. The products of this research are a set of cognitive psychology principles and related training techniques summarized in tabular form, and an outline for a training program structure. Examples of prototype training materials demonstrating the implementation of the cognitive training techniques are provided.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA391035>

RR 1774

Six Myths about Digital Skills Training. (2001). Schaab, B.B., & Moses, F.L. (DTIC No. ADA392922).

Soldiers entering the U.S. Army today encounter an array of weapons, equipment, and technologies that require information-age, digital skills. As these unique digital systems evolve, trainers are challenged to prepare Soldiers to leverage these systems to meet complex and sometimes unanticipated, missions. In order to gain a better understanding of digital skill training, one group of Soldiers was followed for almost a year as they experienced Advanced Individual Training, New Equipment Training, and unit training that covered one major hardware/software change and three software upgrades. Findings are based on observations, surveys, and performance on practical exercises. Results identify several misperceptions regarding the acquisition of digital skills and recommendations for modifying training to improve skill acquisition and transfer. For example, digital skills may not be highly perishable. Soldiers retain what they learned during Advanced Individual Training for at least three-to-four months, but many encounter difficulty in transferring what they have learned to a different problem setting. Training that engages the Soldier by embedding the experience in a real-world context that requires active problem solving can enhance transfer.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA392922>

RR 1775

Assessment of Initial Delivery of the Armor Captains' Career Course: Distance Learning. (2001). Sanders, W.R., & Burnside, B.L. (DTIC No. ADA393635).

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) Armored Forces Research Unit (AFRU) at Fort Knox supports the U.S. Army Armor School (USAARMS) by conducting training research and development. The USAARMS has recently introduced a revised Armor Captains' Career Course (AC3), formerly known as the Armor Officers' Advanced Course (AOAC), for Reserve Component (RC) officers, delivered primarily through Distance Learning (DL). In 1999, the Director of the USAARMS requested that the ARI AFRU at Fort Knox provide Technical Advisory Service to assist in assessment of the new AC3 DL program. The request referred specifically to an assessment of the Internet-delivered Phase IA portion of the course. Results of the assessment provide evidence that the course is at least equally effective in presenting material previously taught in the AOAC RC program. The research also identified additional material that the AC3 DL program covers, which was not included in the AOAC RC program. This report provides training developers and Army leaders with a better understanding of the capabilities and challenges of training programs such as AC3 DL. It also provides course design, development, and implementation insights which may be generalizable to a broad range of Internet-delivered DL programs.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA393635>

RR 1776

Decision Centered Military Operations in Urban Terrain Training for Small Unit Leaders. (2001). Phillips, J., McCloskey, M.J., McDermott, P.L., Wiggins, S.L., Battaglia, D.A., Thordsen, M.L., & Klein, G.A. (DTIC No. ADA394066).

This research effort applied principles of Naturalistic Decision Making to identify the cognitive challenges involved in platoon leader decision making in Military Operations in Urban Terrain (MOUT) building clearing missions. The findings informed the development of classroom, hardcopy, and multimedia training products to support Infantry Officer Basic Course students in MOUT decision making. A Cognitive Task Analysis of the building clearing task entailed a series of in-depth interviews with Army personnel experienced in MOUT. The analysis resulted in a detailed representation of eleven high-level decision requirements associated with the building-clearing task. Cognitive demands related to each requirement - critical decisions and judgments, sensory cues, other actors, and expert strategies - are included in the representation. Four products were developed based on the findings of the analysis: sixteen decision-centered training scenarios for MOUT environments; an interactive, multimedia tool (IMPACT) that supports instructors in training MOUT decision making skills; a classroom exercise that supports situation awareness appreciation and understanding; and a guide that provides supplemental information regarding the building clearing task from a platoon leader's perspective.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA394066>

RR 1777

Training Critical Thinking Skills for Battle Command: ARI Workshop Proceedings. (2001). Riedel, S.L., Morath, R.A., & McGonigle, T.P. (DTIC No. ADA400824).

The ARI Workshop, Training Critical Thinking Skills for Battle Command, was held in 2001 at Ft. Leavenworth. The purpose of the Workshop was to: (1) provide an overview of current research in critical thinking and training critical thinking (CT), (2) provide a forum for identifying and discussing issues related to training CT in the Army; and (3) develop recommendations for training and for future directions for research and development in the area of CT training. Participants with a variety of expertise attended - Military officers, instructors in CT and academic researchers in CT. The following papers were presented: Critical Thinking in the 21st Century by MG (Ret.) Lon Maggart; Thinking Critically about Critical Thinking by Diane Halpern; A Framework for Critical Thinking Research and Training by Susan Fischer; A three part theory of Critical Thinking: Dialogue, Mental Models and Reliability by Marvin Cohen; Critical Thinking in Teams by Daniel Serfaty; and A simulation Tool for Critical Thinking Training by Marvin Cohen. The Proceedings includes these papers, with the exception of the Serfaty paper. Workshop participants discussed a variety of issues related to training CT and their recommendations for training and future research are included in the Proceedings.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400824>

RR 1778

Computer Backgrounds of Soldiers in Army Units: FY 2000. (2001). Fober, G.W., Bredthauer, J.L., & Dyer, J.L. (DTIC No. ADA399393).

The ability of Soldiers to exploit systems using computers and to learn software quickly depends in part on their prior experience. Soldiers from four Army installations were given a survey that examined their experiences with computers, self-perceptions of their skill, and an objective test of their ability to identify Windows-based icons. The officers and senior noncommissioned officers (NCOs) had the most computer expertise as measured by both subjective and objective measures. For enlisted and junior NCOs the picture was more diverse; almost half the Soldiers had limited skills. Owning a computer, frequency of using a computer, and using a computer at work related highly with computer expertise. When specialists (rank of E4) were examined separately, opportunity to use computers as part of their job was related to computer expertise. The results indicate a diverse population, including Soldiers with limited computer skills as well as those with programming skills.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA399393>

RR 1779

Prototype Automated Measures of Command and Staff Performance. (2001). Holden, W.T., Throne, M.H., & Sterling, B.S. (DTIC No. ADA397634).

The transition to the Objective Force is characterized by challenges, such as how the Army will train, maintain, and operate as an information-age force. A key aspect of the Objective Force is command, control, communication, computers, and intelligence (C⁴I) systems. One of the Army's immediate needs is an approach for ensuring that the capacity of digital information systems is fully exploited in combat units, especially among staffs. Staff members must acquire and maintain the skills required on the digital battlefield. Closely linked to training is the need for assessment for feedback and performance improvement, and support for design and development of training programs. Digital C⁴I systems offer an exceptional opportunity for efficient and objective methods for staff performance measurement with their potent organic capabilities to collect, analyze, and portray information automatically. This paper describes an effort to develop prototype performance measure output and format that exemplify the potential of digital systems to provide that feedback. Topics covered include a rationale and definition of automated measures and how they relate to measuring skills that staffs and teams need to possess to be successful. The methodology used to design and develop automated measures of staff performance is discussed. Finally, representative results obtained from these automated prototype measures during U.S. Army concept experimentation will be presented, along with lessons learned during this research effort.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA397634>

RR 1780

Assessing the Effectiveness of a Low Cost Simulator for Instrument Training for the TH-67 Helicopter. (2001). Stewart, J.E., Barker, W.C., Weiler, D.S., Bonham, J.W., & Johnson, D.M. (DTIC No. ADA397649).

The U.S. Army uses the 2B24 Synthetic Flight Training System (SFTS) for the Instrument Phase of Initial Entry Rotary Wing (IERW) training. The SFTS is an instrument simulator, mounted on a hydraulic motion platform, with no visual system. Its technology dates from the late 1960s. Its cockpit represents the UH-1, which has been replaced by the TH-67 training helicopter. The Army is concerned with the age, complexity and costs of the SFTS, at a time when PC-based simulators, like the Frasca 342 Primary Skills Trainer (PST) are available. The PST's cockpit represents the TH-67 helicopter. It has a visual display, but no motion system. Thirty-eight IERW students were assigned to experimental (PST) or control (SFTS) groups. After 30 hours of simulator training, both groups completed 20 hr training in the TH-67. No students were eliminated or set back to later classes. Few significant differences in performance were noted, though SFTS trainees were more likely to indicate that training in the simulator had hindered performance in the aircraft. The PST seemed inferior to the SFTS in trim control. The research demonstrated that IERW students could learn instrument skills in a simpler, more economical simulator without hydraulic controls or a motion system.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA397649>

RR 1781

The Commanders' Integrated Training Tool for the Close Combat Tactical Trainer 3: Final Prototype Development. (2001). Flynn, M.R., Dannemiller, B., Bonnett, M., Gossman, J.R., Forrest, D., Bonnett, M., Shadrack, S.B., & Mauzy, R.P. (DTIC No. ADA397748).

This report describes the third in a series of projects to design and develop the Commander's Integrated Training Tool (CITT) for the Close Combat Tactical Trainer (CCTT), a system of armored vehicle manned-module simulators and workstations that allows units to train collective armor and infantry tasks at the platoon through battalion task force level. The CITT provides unit commanders and other trainers with comprehensive information on CCTT and on structured training as well as the ability to produce exercise Training Support packages. Previous projects produced design for the objective CITT and prototype applications in desktop and web-based formats. The current project produced a fully-fieldable CITT including the embedded CCTT Exercise Initialization Tool. This version was expanded to include stability and support operations capabilities, use of CCTT enhancements, and increased flexibility of file use to allow it to run on any computer with sufficient resources. Near-, mid-, and long-term implementation strategies and fielding plans were developed and are presented along with lessons learned and recommendations for future actions.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA397748>

RR 1782

Training for Adaptability and Transfer on Digital Systems. (2001). Schaab, B.B., & Dressel, J.D. (DTIC No. ADA399409).

Today's Soldiers are being trained to use digital systems to enhance duty performance. This research compared training digital skills to entry-level, enlisted Soldiers by the conventional method to training by a constructivist method. The constructivist method actively engages Soldiers by using realistic vignettes as training tools to acquire and integrate knowledge of the digital system and the military job. After seven days of training, Soldiers trained by both methods were asked to complete 1) a practical exercise requiring application of their training in an unfamiliar vignette and 2) the current schoolhouse exam. No difference was found between the conventional training methods and the constructivist method on the current schoolhouse exam. Soldiers trained using the constructivist method were more successful in applying their training to solve unfamiliar problems and reported lower levels of workload. The constructivist training method was shown to improve Soldiers' adaptation and application of their training to unfamiliar situations.

<http://www.dtic.mil/dtic/tr/fulltext/u2/a399409.pdf>

RR 1783

Working Memory and Exploration in Training the Knowledge and Skills Required by Digital Systems. (2001). Dyer, J.L., & Salter, R.S. (DTIC No. ADA399507).

Variations in computer-based training (CBT) procedures were compared in training the skills and knowledge required of a prototype map interface for the Land Warrior system. Soldiers from four Infantry courses participated, representing the chain of command within an Infantry platoon, from platoon leader to rifleman. Soldiers were first trained on codes that uniquely identified individuals and units on the map. Then Soldiers learned how to use map functions such as pan, zoom, determine range, and find individuals and units. Lessons that contained a large volume of information before Soldiers could apply that information and commit it to memory resulted in low scores on both the code and map exercises. Breaking up the content into smaller chunks of information tended to be more effective. Although Soldiers who learned the map on their own via an exploratory condition had the lowest map performance, exploratory learning may have potential as these Soldiers spent relatively little time "exploring." The results demonstrate the importance of adapting to individual differences in the learning rate of Soldiers. They also provide insights regarding how to design effective and efficient CBT for digital systems.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA399507>

RR 1784

The Computer Background of Soldiers in Infantry Courses: FY 2001. (2001). Singh, H., & Dyer, J.L. (DTIC No. ADA399394).

The research examined Soldiers' experiences with computers, self-perceptions of their computer skill, and their ability to identify frequently-used, Windows-based icons. The report documents the results of the third and last year of Infantry School course surveys. The Soldiers surveyed represented the personnel structure of an Infantry rifle platoon. Computer ownership was high among all Soldiers. Computer experience was gained in different ways, reflecting the circumstances where computers were available to and used by the groups surveyed. Lieutenants and senior noncommissioned officers had the most computer expertise as shown by their icon scores. However, the lieutenants had a higher perception of their computer skill. For junior noncommissioned officers and privates, the picture was more diverse. A substantial portion of these two groups had limited computer skills, as reflected in their icon scores and self-ratings. The results indicate that prior and special training on basic computer skills would be required for many of these younger Soldiers before starting specialized training on a computer-based tactical system. Although only Infantrymen were surveyed, the results should apply to other Soldiers throughout the Army with similar educational and military experience.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA399394>

RR 1785

Making the Transition from Analog to Digital Warfighting: Changes in Unit Behavior and Knowledge. (2001). Dudley, M.G., Johnston, J.C., Jones, W.S., Strauss, C.P., & Meliza, L.L. (DTIC No. ADA397575).

This report documents an initial effort to investigate the transition from analog to digital operations at brigade level and below. We interviewed experienced digital warfighters—leaders and Soldiers—to

identify changes in unit behavior, knowledge, and attitudes resulting from experience with digital systems. Army documents relating directly to digital operations were also reviewed. The research team's subject matter experts analyzed the cumulative data to document insights and lessons learned. The findings revealed a systematic evolution of behaviors, knowledge, and attitudes accompanying the units' transition to digital systems and operations. Initial resistance and reluctance give way to confidence and trust in digital systems as leaders and Soldiers acquire basic digital proficiency and then learn how to use the new technology to improve the warfighting process. Digital capabilities alter the way warfighters think and fight, and the operational changes find their way into procedural documents. As digitization progresses, leaders make bolder decisions due to excellent battlefield visualization and improved situational understanding. Planning, preparation, and execution of combat missions benefit from digital advantages. In parallel, the training environment evolves to support digital operations and readiness. The findings contribute to a knowledge base that will help facilitate the transition process in future digitized units. The findings point towards measures that can be used to assess Army and unit progress in making the transition to digital warfigthing.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA397575>

RR 1786

Situation Awareness in a Virtual Environment: Description of a Subjective Assessment Scale.

(2002). Matthews, M.D., Beal, S.A., & Pleban, R.J. (DTIC No. ADA399408).

The Mission Awareness Rating Scale (MARS), a subjective situation awareness (SA) rating scale designed to assess SA content and SA workload, was tested in a series of virtual environment exercises. Sixteen enlisted Soldiers, working in teams of four Soldiers each, completed four urban combat missions in a virtual night environment designed to simulate the experience of working with night vision goggles - NVG (PVS-7Bs) and aiming lights. In each scenario, a different approach for simulating this NVG environment was used. After each scenario was completed, each Soldier completed the MARS instrument. This yielded estimates of the SA level and workload involved in four dimensions of SA – perception, understanding, projection, and knowing what decision to make. The results indicated that MARS significantly and robustly discriminated among the different approaches, and these SA estimates were congruent with general estimates of SA content and workload while operating at night in the real world, and with the Soldier's subjective rankings of the four simulated NVG environments. While promising, MARS must be validated against objective SA measures, both in the virtual environment and in the field environment. However, MARS seems to hold promise as a relatively unobtrusive and effective SA measure.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA399408>

RR 1787

Utility of a Personal Computer Aviation Training Device for Flight Training.

(2002). Johnson, D.M., & Stewart, J.E. (DTIC No. ADA400580).

Personal Computer Aviation Training Devices (PCATDs) have recently been shown to support beginning flight training both in the private sector and the military. These positive results are for fixed-wing aircraft only. The purpose of this research was to investigate which tasks from Initial Entry Rotary Wing (IERW) training could be supported by a PCATD. A utility evaluation was performed. Sixteen aviators, representing both highly experienced and student helicopter pilots, evaluated the ability of a commercial PCATD to support IERW. Seventy-one tasks were selected from Primary and Instrument Flight Training. Aviators performed each task one or more times in the PCATD before rating it on a four-point scale. Additional data were also collected. Results showed remarkable agreement between the experienced aviators and the students. The device was judged as best able to support Instrument Flight Training, especially tasks involving radio navigation. Tasks from Primary Flight Training, especially tasks requiring hovering, were judged as less well supported. The most frequently stated positive comment was that the device would be of value in supporting the training of instrument procedures. The three most frequently cited criticisms of the device concerned narrow field of view, poor visual cues to depth, and inability to hover.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400580>

RR 1788

Collective Staff Training in a Virtual Learning Environment.

(2002). Sanders, W.R. (DTIC No. ADA400495).

As the Army transitions to modern digital command and control technology it faces a major challenge in designing web-delivered training to support the acquisition, retention, and transfer of collective staff

skills required to apply these advanced technology capabilities to real-world tasks. This report identifies training program design features based on principles of cognitive psychology that can be incorporated into Virtual Learning Environment (VLE) collective training. A prototype Cognitive Training Techniques Checklist was developed and applied in a review of U.S. Army Armor School Virtual Tactical Operational Center (VTOC) collective training. From this review candidate training program design features were identified that can support VLE training requirements. The examination of VTOC training also provided insights for Train-the-Trainer products, and a description of potential future C2 system operational capabilities and challenges. The research represents a logical extension and continuation of previous U. S. Army Research Institute for the Behavioral and Social Sciences cognitive skills training, and distance learning research conducted to assist the U.S. Army Armor School in assessing the individual self-paced phase of training for a new Armor Captains' Career Course – Distance Learning (AC3 DL) offered primarily as web-based instruction.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400495>

RR 1789

Simulating Night Vision Goggle Effects in a Virtual Environment: A Preliminary Evaluation. (2002). Pleban, R.J., & Beal, S.A. (DTIC No. ADA402194).

This research examined the capabilities of virtual environments to simulate night vision goggle (NVG) effects. Different solutions for simulating NVG images were assessed. Two conditions simulated NVGs but used different software approaches. Two additional conditions simulated unaided night environments that required Soldiers to wear NVGs. Four-man infantry teams conducted urban operation missions under each condition. Objective assessments were obtained on the number of events correctly detected and the average time required to detect an event. Subjective assessments of task difficulty and image fidelity were also made. No significant differences were found across night conditions for either event detection or time. Significant differences in task difficulty ratings occurred for movement, visual detection, and maintaining situation awareness. In general, tasks were more difficult to perform while wearing the NVGs compared to simulated versions of NVG images. Soldiers also ranked the conditions involving actual NVGs as more realistic. The unique contribution of virtual environments for night operations training may be at the entry level. However, specific image fidelity issues associated with the use of NVGs in simulated unaided night environments must be addressed if this approach is to be used as an effective training medium.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA402194>

RR 1790

An Overview of Automaticity and Implications for Training the Thinking Process. (2002). Holt, B.J., & Rainey, S.J. (DTIC No. ADA402420).

This report examines the relationship between automaticity and thinking processes. Issues pertaining to the development of automaticity within the thinking process are discussed. A literature review was conducted to examine how automaticity has been developed in various tasks of all types (e.g., visual search to battlefield thinking). The results of this examination suggest that automaticity can be developed using consistent rules and extensive practice that vary depending on the type of task. The results also suggest that the more complex the task is the more difficult it will be to train to automatic performance. Principles are presented that are used to guide the development of automaticity. Using these principles, along with previous methodologies for developing automaticity, this report discusses training methods for developing automaticity in the thinking process.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA402420>

RR 1791

Measuring Digital Proficiency: Assessment Approaches and Echelon Considerations. (2002). Dudley, M.G., Hill, R.W., Johnston, J.C., Jones, W.S., LeGare, M., Leibrecht, B.C., Longoria, K., & Meliza, L.L. (DTIC No. ADA405055).

Digitization threatens to overwhelm trainers with observation requirements, making it crucial to identify aspects of unit performance likely to warrant the attention of trainers and others with a need to measure unit digital proficiency. This report encompasses two approaches used to target high-payoff measurement objectives. First, the research team described differences between brigade and battalion echelons in terms of how digital systems are employed. This approach assumed that a high priority for brigade exercises is to address brigade-unique aspects of digital proficiency. Second, the team described how units can use digital systems to gain two of the major advertised benefits of digitization, reducing fratricides and gaining greater control over how and when contact is made with the enemy. In

addition to describing unit actions that can be supported by effective use of digital systems (e.g., supporting unit transition from movement to maneuver), the team considered whether it is better to measure digital support of each action using an all-or-none approach or a graded approach. This latter consideration provides input for efforts to define digital proficiency levels.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA405055>

RR 1792

Human System Integration for Future Command and Control: Identifying Research Issues and Approaches. (2002). Lickteig, C.W., Sanders, W.R., Shadrack, S.B., Lussier, J.W., Holt, B.J., & Rainey, S.J. (DTIC No. ADA405044).

The Army's transformation to Future Combat Systems (FCS) poses an unprecedented alliance of humans and machines, particularly for Command and Control (C²). Creating a human-machine alliance that actually improves command and control is a severe challenge in human-system integration for FCS. First, this report selectively identifies four overarching research issues for command and control: Allocation, Autonomy, Authority, and Awareness. Second, two complementary research approaches, mid-scale and small-scale transformation environments, for investigating human-system integration issues are described. An example of a mid-scale transformation environment from the FCS C² program is provided with selected results from Experiment 1 on human-system integration. The value added by small-scale transformation environments, however, is needed to maintain a human-centric focus and provide two unique roles: a breeding ground for innovation to larger environments, and proving ground for issues from larger environments. An example of an emerging small-scale transformation environment directed at FCS concept exploration and training is provided. The core technical, operational and human performance assets currently available for this small-scale transformation environment are described. The report's intended audience includes any members of the user, researcher, and developer community who might benefit from, or provide benefit to, the Army's ongoing FCS research program.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA405044>

RR 1793

Command Group Training in the Objective Force. (2002). Gossman, J.R., Burnside, B.L., Flynn, M.R., Dannemiller, B., & Mauzy, R.P. (DTIC No. ADA406176).

As part of future force development, the U.S. Army has begun a transformation to an Objective Force capable of achieving full-spectrum dominance in all future conflicts. This transformation will require changes in training, particularly the training of teams. Objective Force teams will likely consist of small groups of individuals (and probably robots or intelligent agents) and will have new and modified performance requirements leading to unique training needs. Teams will conduct training continuously using portable devices and training support capabilities embedded in their vehicles. Meeting these sorts of team training requirements is likely to require new training tools and techniques. This project collected and analyzed information related to Objective Force Unit of Action command groups, and, based on the analyses, developed training requirements for and identified an approach to training teams that fully supports training anytime, anywhere using operational equipment. A discussion of future research and development issues is also provided. The results of this project can benefit those involved in further definition and development of the training requirements, particularly team training requirements, for the transformation to the Objective Force.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA406176>

RR 1794 — Cancelled

RR 1795

Assessing Situation Awareness in Field Training Exercises. (2002). Matthews, M.D., & Beal, S.A. (DTIC No. ADA408560).

The Mission Awareness Rating Scale (MARS) and the Situation Awareness Behavioral Rating Scale (SABARS) are metrics designed to assess situation awareness (SA) among infantry Soldiers and their leaders. MARS is a subjective self-assessment device and SABARS involves expert observer-controllers evaluating a target Soldier on SA-related behaviors. The purpose of the current study was to field test both metrics in a field training exercise. Eight cadet platoon leaders and eight cadet squad leaders participating in summer cadet field training at the U.S. Military Academy completed the MARS instrument and received SABARS evaluations from observer-controllers following the completion of an assault mission. Results indicated that platoon leaders rated their SA higher than did squad leaders on the MARS instrument and that higher-order SA was rated as more difficult than lower-order SA.

SABARS ratings did not differ as a function of leader position, but the global SABARS SA item was a strong predictor of ratings of individual performance. Finally, SABARS was rated by the observer-controllers as easy to use and relevant to assessing SA in the field. Both MARS and SABARS show promise of applicability to assessing SA in field settings.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA408560>

RR 1796 — Cancelled

RR 1797

Enhancing Officer Candidate School Enrollment in the Army National Guard. (2002). Smith, M.D., & Hagman, J.D. (DTIC No. ADA408871).

This research examined why ARNG state OCS attendance is dropping, and what can be done about it. Standard Installation/Division Personnel System (SIDPERS) records were used to determine how many pay grade E4-8 Soldiers (i.e., Specialist/Corporal through First/Master Sergeant) currently meet OCS enrollment eligibility requirements. Results indicated that of the four (out of a total of eight) objective eligibility requirements documented in SIDPERS, the age limit of 30 has the greatest negative impact. Almost 60% of the Soldiers in the total sample, and more than 90% of those in pay grades E6-E8, are simply too old to apply. To determine the impact of eligibility requirements not documented in SIDPERS, a nationwide survey of E4-8 ARNG Soldiers was conducted. Results from the completed surveys of 500 respondents revealed that only 5.5% meet all eight objective OCS eligibility requirements. Based on both survey responses, and SIDPERS data, ten recommendations are proposed for enhancing ARNG state OCS enrollment through the use of more targeted recruitment, better incentives, and revised eligibility criteria.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA408871>

RR 1798

Vertical Teams in the Objective Force: Insights for Training and Leader Development. (2002). Cox, J.A., Holder, L.D., Leibrecht, B.C., & DeRoche, L. (DTIC No. ADA408924).

This report addresses the selection and training challenges expected for vertical teams—commanders and staff leaders of multiple echelons—in the Army's planned Objective Force. Researchers interviewed experienced warfighters and trainers operating in the Interim Brigade Combat Team (IBCT) environment. They also observed collective training events conducted by the Army's first IBCT, and reviewed Army documents relating directly to the Objective Force and Future Combat Systems. The findings document the selection considerations (knowledge, skills, and aptitudes), training issues (problems and challenges), and training methods expected to shape vertical teams in the future force.

Recommendations are offered for steps to expand the database related to training, leadership, and Soldier factors. The results forge a foundation for creating and sustaining high-performing teams that can fight and win on the battlefields of the future.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA408924>

RR 1799

The Computer Backgrounds of Soldiers in Army Units: FY 2001. (2002). Singh, H., & Dyer, J.L. (DTIC No. ADA409024).

A multi-year research effort was instituted in FY99 to examine Soldiers' experiences with computers, self-perceptions of their computer skill, and their ability to identify frequently used, Windows-based icons. This report documents the results of the second and last year of surveys from Soldiers in Forces Command units. The Soldiers surveyed were from mechanized and non-mechanized Infantry companies, the battalion staff, and battalion slice elements (Medics, Combat Engineers, and Field Artillery). The officers and senior noncommissioned officers had the most computer expertise as measured by their icon scores. For junior noncommissioned officers, specialists, and privates, the picture was more diverse. Almost half of these Soldiers had limited computer skills, as measured by both subjective and objective indices. Frequency of using a variety of computer features on a regular basis related highly to computer expertise. When specialists and corporals were examined separately, opportunity to use computers as part of their duty position was also related to computer expertise. The results indicate that young Soldiers with limited computer skills would benefit from basic computer training prior to learning specialized training on the Army's new digital systems.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA409024>

RR 1800

Preliminary User Feedback of a Prototype Bradley Fighting Vehicle M2A3 / M3A3 Embedded Training System. (2002). Salter, M.S., & Rich, K.B. (DTIC No. ADA408855).

This report documents three user evaluations of the prototype Bradley Embedded Training System (BETS) device. The BETS is an embedded gunnery trainer for the A3 version of the Bradley Fighting Vehicle (BFV). The BETS uses BFV vehicle controls and optics, and the same training device software as the already fielded gunnery trainer BATS, the Bradley Advanced Training System. Bradley personnel from Fort Benning and Fort Hood fired two gunnery exercises using the prototype BETS device and provided comments about the device and its potential capabilities. Users almost universally expressed very high positive opinions about the BETS prototype and its potential.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA408855>

RR 1801

Integrated Training and Performance Support for the Objective Force. (2003). Throne, M.H., & Burnside, B.L. (DTIC No. ADA410554).

The U.S. Army has begun transformation to an Objective Force operating within joint, interagency, and multinational environments. This transformation will require changes in training, with more of a reliance on embedded training and electronic performance support system (EPSS) capabilities, in order for units to be responsive, deployable, agile, versatile, lethal, survivable, and sustainable. This report reviews Objective Force training needs and applies an existing method for analyzing the appropriateness of alternative methods for meeting these needs. This initial analysis indicates that for the overall systems level, fully or appended embedded training is recommended. At the task level, embedded training is appropriate to varying degrees, depending on a number of considerations. Information on the performance of all tasks should be embedded, but practice of task performance with feedback should only be embedded where safe, reasonable, and cost-effective. This report also includes a brief summary of the embedded training and EPSS literature, leading to derivation of a set of usage considerations and design guidelines for developing effective embedded training and EPSS capabilities.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA410554>

RR 1802

The Effectiveness of Web-Based Instruction. (2003). Wisher, R.A., & Olson, T.M. (DTIC No. ADA413462).

As the Army focuses more on Web-based instruction as a delivery option for training, professional development, and education, it is important to understand its instructional effectiveness. A search of the literature between 1996 and 2002 identified more than 500 reports concerning Web-based courses that are courses delivered over the Internet or an intranet and conveyed through a browser. Most concerned recommendations for design or technology issues rather than empirical measures of learning outcomes. From this larger set, 47 studies reported empirical measures of outcomes; of these, 15 studies reported data with sufficient detail to compute an effect size. The effect size, comparing Web-based instruction to conventional classroom instruction, was .24, which means the "average" student moved from the 50th to the 59th percentile. In earlier analyses of the effectiveness of other forms of computer-based instruction, effects sizes of between .32 and .41 have been reported (corresponding to the 63rd and 66th percentiles). In terms of instructional effectiveness, it appears that current practices in Web-based instruction improve learning when compared to the classroom, but many more complete studies are needed before the full effect size is understood.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA413462>

RR 1803

Development and Evaluation of Communication Based Measures of Situation Awareness. (2003). Evans, K.L., & Christ, R.E. (DTIC No. ADA413106).

The present investigation sought to develop and field test two new behavioral measures of situation awareness (SA) that rated the content of small unit radio transmissions. Initially, a four-person team generated an item pool of 318 critical incidents of communication behavior, each intended to represent either an outstanding, typical, or poor level of SA on the part of small unit leaders. A group of 24 independent evaluators then rated the degree to which they thought each of the 318 items was related to the concept of SA. The 20 items having the highest levels of agreement among the independent evaluators within each SA level were chosen to comprise the Radio Communications Checklist of Leader Awareness (RCCOLA) and the Future Expectations of Likely Leader Awareness (FELLA) scale. Six field

trials were then conducted with each of seven squad leaders and their respective squads. Based on their monitoring of squad and platoon radios, two independent raters completed separate RCCOLA checklists during each of the 42 total trials, as well as separate FELLA scales after the completion of each trial. Interrater agreement was generally high for both measures. Based on their methods of construction, we can also assume they possess some content-related validity.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA413106>

RR 1804

Using the Laser Marksmanship Training System to Predict Rifle Marksmanship Qualification. (2003). Smith, M.D., & Hagman, J.D. (DTIC No. ADA415716).

To determine the relation between simulation- (Laser Marksmanship Training System [LMTS]) and live-fire-based rifle marksmanship performance, 186 Reserve Component (RC) Soldiers from Idaho and Oregon fired for qualification on a scaled LMTS version and live-fire version of the Army's standard pop-up target qualification course. LMTS was fired under either a dry-fire mode or a Blazer (i.e., sound/recoil replicator) mode. Statistically significant positive linear relations were found (and then validated) between first-run live-fire scores and both LMTS dry-fire- ($r = .50$) and Blazer-based ($r = .55$) scores. These relations were of sufficient strength to permit development of easy-to-use tools for accurately predicting Soldier chances of first-run, live-fire qualification. With these tools, RC marksmanship trainers can implement a competency-based training program where Soldiers most in need of remedial training (i.e., poor shooters) can be quickly identified, and the point at which sufficient training has been provided (i.e., when first-run live-fire qualification is likely) easily determined. These tools also provide RC unit commanders with empirically derived live-fire performance standards needed to support use of LMTS in place of live-fire for rifle marksmanship proficiency validation purposes when standard pop-up target course range facilities are not readily available. Although both tools will serve these purposes that based on LMTS dry-fire is recommended because of the added expense of firing with Blazer without an accompanying statistically significant increased predictive benefit.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415716>

RR 1805

Training the Troops: What Today's Soldiers Tell Us about Training for Information Age Digital Competency. (2003). Schaab, B.B., & Dressel, J.D. (DTIC No. ADA415297).

Army transformation requires Soldiers who can use information-age digital skills to accomplish tasks and to do essential coordination with others. The objective of this research was to gain insights on best practices for training; this was accomplished by interviewing Soldiers currently trained on, and using the Army's most advanced digital technology. Sixty-two operators of Army Battle Command Systems (ABCS) answered questionnaires and participated in interviews that addressed the Soldiers' perspectives on how best to capitalize on training to meet the demands of the current Army and the Army of the future. Findings showed that Soldiers desire and need additional training on how to integrate their digital systems to accomplish their Army mission. They want this training to be hands on, scenario based, and in a full job flow sequence. Soldiers noted difficulties with different digital systems communicating with each other, which degrades situational awareness. Another concern was the dependence on contract personnel to maintain and troubleshoot equipment. This snapshot of the current state of digital training in U.S. Army units provides insights from the users' perspective that highlights preferred and advantageous training practices.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415297>

RR 1806

Using Virtual Environments for Conducting Small Unit Dismounted Mission Rehearsals. (2003). Pleban, R.J., & Salvetti, J.D. (DTIC No. ADA415298).

This research examined the use of virtual environments as a viable dismounted infantry mission rehearsal tool. Four squads of Soldiers individually conducted two missions that involved clearing a two-story building located at an urban operations training site. Two squads rehearsed the mission in a virtual representation of the exact building they would clear at the urban training site. The remaining squads rehearsed in an actual two-story building that was similar to the one they would clear at the urban training site. Squads executed both missions in each environment. Performance differences between the rehearsal groups across the two 'real-world' missions were small to negligible. Group performance differences for fratricides and personnel flagging were negatively affected by simulator constraints. Effectiveness ratings for the two rehearsal modes were clearly dependent on the setting where Soldiers rehearsed. The research showed that while virtual environments show promise for this type of training, a

number of interface and technology problems must be overcome. Currently, virtual environments do not appear to be as effective as real-world tactical training for improving skills underlying specific small unit tasks or battle drills. However, these environments may be used effectively at selected stages of training to enhance cognitive skills development.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415298>

RR 1807

Recommendations for an Army NCO Semi-Centralized Promotion System for the 21st Century.

(2003). Knapp, D.J., Heffner, T.S., & Campbell, R.C. (DTIC No. ADA415686).

The NCO21 research program was undertaken to help the U.S. Army plan for the impact of future demands on the noncommissioned officer (NCO) corps. The performance requirements and associated knowledges, skills, and aptitudes (KSAs) expected of future successful NCOs were used as a basis for developing tools that could be incorporated into an NCO performance management system geared to 21st-century job demands. The predictor measures include the Armed Services Vocational Aptitude Battery (ASVAB), Assessment of Individual Motivation (AIM), and Biographical Information Questionnaire (BIQ), which are already used in the Army for other purposes. A written Situational Judgement Test (SJT), the Experience and Activities Record (ExAct), Personnel File Form (PFF21), and a semi-structured interview were developed for this project. Two types of rating scale instruments were developed for gathering criterion data against which to validate (evaluate) the predictor measures. The Observed Performance Rating Scales ask supervisors to rate Soldiers on how well they perform in their current jobs. The Expected Future Performance Rating Scales ask supervisors to predict how their Soldiers would perform in specific sets of conditions expected to be characteristic of future Army requirements. This report summarizes the NCO21 research program and offers recommendations for Army policymakers regarding use of the tools developed through this research.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415686>

RR 1808

Web-Based Collaborative Learning: Communication Between Learners Within a Virtual Tactical Operations Center. (2003). Belanich, J., Orvis, K.L., & Wisher, R.A. (DTIC No. ADA415918).

In 2001, the U.S. Army Armor School designed a blended course for reserve officers with both distributed learning and in-residence components. The distributed portion consisted of an asynchronous phase, where officers completed lessons on their own time, and a synchronous phase, where they used a virtual tactical operations center (VTOC) simultaneously but from different locations. One primary method of communication during synchronous VTOC training was computer-based text messaging. The text messages for five teams consisting of seven to nine members were recorded. The analysis of these text messages revealed that a majority of the communication was related to the operational task. The second most frequent type of text messaging was social in nature, and this type of communication peaked during the initial training sessions and during the final session. The least frequent type of communication was technology-related text messages, those where the user was having difficulty with the system and asking for help or a person replying to a help query. Technology-related communication occurred modestly during the initial sessions, but tailed off dramatically as sessions progressed. The students, instructors, and course designer all took part in interviews about their opinions on the distributed learning components of the course. The overall ratings of the distributed learning portion of the course were positive.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415918>

RR 1809

Training and Training Technology Issues for the Objective Force Warrior. (2003). Zipperer, E., Klein, G.E., Fitzgerald, R., Kinnison, H., & Graham, S.E. (DTIC No. ADA419873).

The Objective Force concept calls for combining what is best from conventional and Special Operations Forces (SOF) cultures. This work identifies successful SOF training approaches and training issues that are potentially appropriate for training Objective Force Warrior (OFW) dismounted combatants and small units. A training questionnaire and detailed interviews were given to nine senior active duty and recently retired NCOs who were chosen for their combat experience, instructor time, and extensive SOF experience. Supplementary interviews were conducted with subject matter experts from the Infantry School and retired officers and NCOs working in high-risk training occupations such as law enforcement special weapons and tactics instructors, security and protective services, and medical professionals. The report contains four complementary sections: OFW relevant SOF training and training technology issues; SOF training techniques for various operational specialties; a listing and description of high-

risk/high performance military related trainers in the private sector; and training technology vendors for the areas of sustainability, mobility, survivability, lethality, and situation awareness. The training and training technology issues discussed include time management, command of the basics, skill mastery, combat-focused training, visualization, emphasis on appropriate repetition, and the use of simple aids. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419873>

RR 1810

Exploiting FBCB2 Capabilities Through Realistic Feedback. (2003). Leibrecht, B.C. Lockaby, K.J., & Meliza, L.L. (DTIC No. ADA415999).

This report describes the development of proficiency measurement architecture for the Force XXI Battle Command Brigade and Below (FBCB2). It first explores primary dimensions of FBCB2-enabled performance—high-priority system capabilities, user digital skills and tasks, and network management skills. It then examines key factors that influence digital performance, including echelon, mission phase, unit standing operating procedures, task difficulty, and common performance problems. Finally, it discusses measurement implications of digitization, a comprehensive framework for presenting observation guidelines, and implications for FBCB2-focused After Action Reviews (AAR). The collective findings establish a basic architecture for measuring high-payoff proficiency targets, enhancing performance feedback capabilities, and optimizing the benefits of digital training programs. Two practical tools will help leaders and trainers focus on FBCB2-enabled skills that contribute significantly to combat effectiveness. Key recommendations for expanding the architecture and knowledge base are included.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415999>

RR 1811

Training Adaptability in Digital Skills: The Learning Skills Bridge Learning Accelerator.

(2003). Hess, K.P., Alliger, G.M., Linegang, M.P., Meischer, S., Garrity, M.J., Hertel, M., & Bailey, A. (DTIC No. ADA416238).

The objective for this SBIR Phase II project was to increase the degree to which Soldiers are able to apply classroom/computer-mediated training on-the-job and to capitalize on their present digital skills in the acquisition of new and changing digital skills. Aptima, Inc. and the Group for Organizational Effectiveness, Inc. used basic theories of learning transfer to create a two-module training package designed to increase digital skill adaptability. This Learning Skills Bridge learning accelerator training package (LSB) was pilot tested, revised, and re-tested. The study found that training designed to increase basic computer knowledge (e.g., the LSB) does result in learning transfer to the Advanced Field Artillery Tactical Data Systems (AFATDS). Specifically, the LSB training eliminated any group differences based on prior computer experience, and thus compensated for deficient computer experience. Also, participants scored significantly higher on the measures of AFATDS networks and AFATDS visualization and Mapping after LSB training than they did before the training. Further, 88.8% of participants reported that the LSB training improved their understanding of AFATDS. From these results it was concluded that generalizable, transferable digital skills taught in the context of device- and job-specific goals (such as with the LSB) has promise in increasing adaptability in the use of those digital skills.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA416238>

RR 1812

Human Performance Essential to Battle Command: Report on Four Future Combat Systems Command and Control Experiments. (2003). Lickteig, C.W., Sanders, W.R., Durlach, P.J., Lussier, J.W., & Carnahan, T.J. (DTIC No. ADA419499).

The Army's ongoing transformation to Future Combat Systems (FCS) requires an unprecedented alliance of humans and machines. Creating an alliance that actually improves, and does not impede, battle command is a human systems integration challenge for FCS and particularly the area of command and control (C²). To address that challenge, the FCS C² program is investigating future battle command concepts at the small unit level. The FCS C² effort, led by Defense Advanced Research Projects Agency (DARPA) and Communications Electronics and Engineering Command (CECOM) with a focus on human performance by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), included a series of command-in-the-loop experiments from 2001 to 2003. This report summarizes research methods and findings on human performance across four iterative and exploratory FCS C² experiments. The human performance findings reported are based on subjective measures and highly detailed objective measures of the command group's verbal and human-computer interactions. Overall, the

results provide an emerging empirical database on the C² functions and tasks required by an FCS command group in collaboration with prototype C² systems. More problematic conclusions on workload and training are followed by more promising conclusions on user-based involvement and proactive research, and particularly their potential for solving workload and training problems.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419499>

RR 1813

Advanced Bradley Full Crew Interactive Simulation Trainer Limited User / Functional Test. (2003). Salter, M.S. (DTIC No. ADA419463).

This paper documents the technical advisory service provided by the U.S. Army Research Institute for the Behavioral and Social Sciences to the Training and Doctrine Command (TRADOC) Systems Manager Stryker/Bradley (TSM-SB) in a comparison assessment of the Bradley Conduct of Fire Trainer (COFT) and the Advanced Bradley Full-crew Interactive Simulation Trainer (AB-FIST). The informal limited user/functional test collected data in two areas. The first portion of the test was designed to compare the stated capabilities of the AB-FIST as compared to those of the COFT. The second portion of the test was designed to elicit feedback from experienced users about the new device. Based on this limited test, the AB-FIST was seen to perform as well as or better than the COFT, and could be used to supplement or augment the COFT where that device is unavailable.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419463>

RR 1814

Combat Leaders' Guide: Leader Handbook 2003. (2003). Salter, M.S. & Centric, J.H. (DTIC No. ADA419464).

This paper briefly documents the history of the initial Combat Leaders' Guide (CLG) project from its inception in 1985 to the 2003 reprint of the CLG. A copy of The Combat Leaders' Guide: Leader Handbook 2003 is provided in Appendix A. The CLG is a pocket-sized job performance aid, useful to any Soldier. The CLG product provides a trained leader with the steps required to perform many common leader tasks in a quick reference, easy to read format. More than 50,000 CLGs have been distributed to Soldiers for use at home station, during deployments, and for use in field exercises, unit evaluations, and at each of the Combat Training Centers. The CLG has gone on stability and support operations, and has gone to war with Soldiers. Users have been supportive of and responsive to the CLG as evidenced by the continuing individual and unit requests received by ARI.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419464>

RR 1815

Training Future Force Leaders to Make Decisions Using Digital Information. (2003). Archer, R., Warwick, W., McDermott, P.L., & Katz, J. (DTIC No. ADA419668).

This report was developed under a Small Business Innovation Research (SBIR) Program, Phase I. The research sought to understand differences in decision making between traditional Infantry operations and Objective Force Warrior (OFW) operations. In OFW, digital information such as video sensors and detailed map overlays will replace probabilistic cues from the environment. The question was whether and how digital information will change the way decisions are made and information is processed. Naturalistic Decision Making methodologies were used to understand the cognitive requirements of both types of operations. While the decisions themselves do not differ, the decision-making process and the information used are different with digital information than with traditional cues. Decision making with digital information is more analytical and the OFW small unit leader must be trained to maintain coherence in order to get an accurate picture of the mission environment. There are additional steps of data analysis and data fusion because the digital information is not from the leader's own perception. Spatial orientation will become a key issue and skill in the electronic battlefield. This understanding of the decision process in the electronic battlefield was used to develop training requirements and a replicable methodology for addressing the training challenges.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419668>

RR 1816

MINDPRINT: Developing the Soldiers and Leaders of Objective Force and Beyond. (2004). Baxter, H.C., Phillips, J., Shafer, J., Klein, G.A., & Mosier, K. (DTIC No. ADA419727).

This report was developed under the Phase I Small Business Innovation Research (SBIR) Program. Information technologies are changing the way organizations do business. In the case of the Army's

Objective Force, these technologies will fundamentally transform the way in which battles are fought. They will also transform the decisions, judgements, and cognitive tasks of Soldiers and leaders. Without adequate preparation for these new cognitive requirements, the Army will be ill-equipped to use, much less capitalize on, the new technologies. The need is to (a) identify, in advance, the requirements introduced by Objective Force technologies, and (b) build skill and expertise around those requirements prior to implementation of the new technologies. In this research, a macrocognition framework was employed to study how Objective Force technologies will alter the cognitive landscape for small unit leaders. Data collection methods were developed to capture the macrocognitive requirements associated with the new technologies. Findings suggest that substantial changes will occur with regard to seven macrocognitive activities: the Sensemaking and Coordination functions, and the processes of Maintaining Common Ground, Developing Mental Models, Uncertainty Management, Attention Management, and Turning Leverage Points into Courses of Action. Preliminary implications for training addressing each of these macrocognitive activities are presented.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419727>

RR 1817

Training on Common Military Messages. (2004). Dyer, J.L., Vaughan, A.W., & Blankenbeckler, P.N. (DTIC No. ADA419918).

The experiment examined what inexperienced Soldiers learned from a computer based training program on four common Army messages: Spot Report, nuclear/biological/chemical, call for fire, and medical evacuation. It also examined the ability of Soldiers to complete tactical messages based on hypothetical combat scenarios and a prototype digital interface for the Land Warrior (LW) system. The message training focused on the doctrinal requirements for messages, not how to use the software interface. Soldiers (n = 48) were from the Infantry One Station Unit Training course. The findings showed that inexperienced Soldiers have limited knowledge of common Army messages. Although the Soldiers learned from the message training, the doctrinal training per se was shown to be a necessary, but not a sufficient condition for determining appropriate message content in hypothetical tactical situations. Soldiers also need training on digital message formats and menu selections, must possess the requisite military knowledge and experience, and have the ability to understand the battlefield situation and integrate critical elements of information. Additional research is needed on the types and length of training needed to prepare Soldiers to generate appropriate military messages.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419918>

RR 1818

Multi-Echelon Distributed Army Leaders' Information Support Training: Prototype Development and Recommendations for Future Research. (2004). Graves, C.R., Heiden, C.G., Jenkins, S.N., Flynn, M.R., Smith, P.G., Brown, S.H., & Shadrick, S.B. (DTIC No. ADA420036).

As the U.S. Army approaches the Future Force timeframe, challenges include developing leaders who are proficient in the conduct of dispersed operations and delivering effective training when and where training needs arise. This report describes the recently completed Multi-Echelon Distributed Army Leaders' Information Support Training (MEDALIST) project. The project was sponsored by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) Armored Forces Research Unit and had two primary objectives. The first was to identify selected communication requirements essential to conducting decentralized battle command in dispersed operations. The second was to develop and demonstrate a distributed approach for training those and related requirements in a multi-echelon, small group, deliberate practice setting. This report presents the project's background, objectives, activities, and outcomes. It represents the final documentation of the project and includes recommendations for the continued development of the MEDALIST training approach and the design of future Army training and simulations.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419918>

RR 1819

Future Combat Systems Command and Control Human Functions Assessment: Experiment 3. (2004). Lickteig, C.W., Sanders, W.R., Durlach, P.J., and Carnahan, T.J. (DTIC No. ADA420960).

The Army's ongoing transformation to Future Combat Systems (FCS) requires an unprecedented alliance of humans and machines. Creating an alliance that actually improves, and does not impede, battle command is a human systems integration challenge for FCS and particularly the area of command and control (C²). To address that challenge, the FCS C² program is investigating future battle command concepts at the small unit level. The FCS C² effort, led by Defense Advanced Research Projects Agency

(DARPA) and Communications Electronics and Engineering Command (CECOM) with a focus on human performance by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), included a series of four command group-in-the-loop experiments from 2001 to 2003. This report provides exemplar research methods and findings on human performance from Experiment 3.

The human performance findings reported are based on subjective measures and highly detailed objective measures of the command group's verbal and human-computer interactions. Interim conclusions are provided on the following topics: workload, training, automated measures, and human-system integration. In closing, a brief set of sustain and improve recommendations are provided for future research efforts. A companion report provides a more comprehensive assessment of future command group performance across FCS C² Experiments 1-4.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA420960>

RR 1820

Assessing the Effectiveness of the Close Combat Tactical Trainer. (2004). Mastaglio, T.W., Peterson, P., & Williams S. (DTIC No. ADA421746).

This report summarizes a project conducted to develop a methodology to evaluate collective training devices and apply that methodology to the Close Combat Tactical Trainer (CCTT). CCTT is a complex collective training device; there are significant cost and operational management issues in performing a controlled training transfer study or effectiveness evaluation. The study developed a qualitative method for performing qualitative effectiveness assessments and used it to evaluate the effectiveness of CCTT. The methodology was demonstrated to be effective. Based on analysis of feedback and perceptions acquired during data collection visits to units and fixed sites the consensus opinion of users is that CCTT is performing the mission for which it was designed. Users have embraced the technology, are enthusiastic proponents as well as eager users, and have little criticism of the simulator technology, the overall training environment, or site operations. CCTT is a critical capability that provides a step or gate in preparing for major live training events. Users do not rate the importance of training in CCTT as highly as field training. Planning for CCTT exercises and command oversight of those activities varies significantly by unit.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA421746>

RR 1821

Novice Versus Expert Command Groups: Preliminary Findings and Training Implications for Future Combat Systems. (2004). Carnahan, T.J., Lickteig, C.W., Sanders, W.R., Durlach, P.J., & Lussier, J.W. (DTIC No. ADA421871).

The U.S. Army's ongoing transformation to Future Combat Systems (FCS) requires a commensurate transformation in training, particularly in the area of command and control (C²). This paper describes research comparing novice versus expert command group performance to identify training recommendations and implications. The research was performed by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) in conjunction with the FCS C² program. Comparative results were based on objective measures of verbal and human-computer interaction (HCI) as well as subjective measures of workload, performance success, training, prototype effectiveness, and human system integration. Significant differences were identified between novice and expert command groups including lower verbalization and HCI rates by novices during enemy target identification, and higher rates of verbalization and HCI by novices in support of the destruction of enemy targets. Training examples were provided for more specific and tangible guidance to training developers and designers. Overall, the findings and training implications underscore the new training requirements for FCS, particularly embedded training, for transforming novices into experts in future command groups.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA421871>

RR 1822

Instructional Characteristics and Motivational Features of a PC-Based Game. (2004). Belanich, J., Sibley, D.E., & Orvis, K.L. (DTIC No. ADA422808).

The purpose of the research was to identify and assess instructional and motivational features of a first-person-perspective game environment. The game used was "America's Army", a popular PC-based game developed by the U.S. Army to inform "recruiting age" individuals about the Army. Twenty-one participants first completed a pre-game questionnaire that assessed prior knowledge of information presented in the game, after which they played the "basic training" sections of the game. Then, participants answered questions regarding information presented during the game and about motivational aspects of the game. Participants recalled procedures better than facts. Information

relevant to the progression of the game was recalled better than information that was not. Graphic images and spoken text were recalled more accurately than printed text. Realism, challenge, exploration, and control were factors that influenced motivation. The findings of the current research were specific to a single PC-based first-person-perspective game, but were in agreement with a broad range of research using other types of games and instructional media.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA422808>

RR 1823

Knowledge Networks for Future Force Training: Illustration of Searching, Retrieval, and Communication Concepts. (2004). Wall, J.A., Elms, R.D., Biggers, K.E., & Sticha, P.J. (DTIC No. ADA425353).

U.S. Army units are transforming to become a lighter, more mobile Future Force that can operate within joint and coalition environments. To enable Future Force units to achieve successful deployment, the Army is developing knowledge networks to provide access to a wide range of information across military operations. To use the vast amount of available information effectively, knowledge networks must include procedures that organize information, identify the most relevant information to meet a user request, authenticate retrieved information, and allow the user to add new information to the network. This project develops and demonstrates a prototype knowledge network that illustrates methods to retrieve information needed to facilitate mission accomplishment, and to share this information among Soldiers and units. This research began with an information engineering activity that analyzed the functions and tasks of Future Force units to identify information requirements. The effort proceeded to develop a prototype knowledge network incorporating relevant existing technologies, including (a) Web crawlers, (b) searching and indexing, (c) rich site summary news feeds, (d) Web logs, (e) user profiling, and (f) personal messaging. The prototype was demonstrated to four Army officers and enlisted personnel, whose impressions provided feedback used to revise the prototype and to make recommendations for future system enhancements.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA425353>

RR 1824

Assessment of the Think Like a Commander Training Program. (2004). Shadrack, S.B., & Lussier, J.W. (DTIC No. ADA425737).

The Think Like a Commander and the Adaptive Thinking Training Method have been used to train adaptive thinking, a specific component of battlefield thinking. The training method uses cognitive battle drills to apply deliberate practice training concepts to commanders' battlefield thinking skills and allows officers to model their battlefield understandings, plans, visualizations, and decisions after expert tactician's thinking patterns. The research described in this report documents the results of the use of the Think Like a Commander training program in the Armor Captain's Career Course at Fort Knox, Kentucky, and experimentally assesses the value of the training. The analysis indicated that use of the Think Like a Commander leads to significant performance gains in a critical area of battlefield thinking: the ability to rapidly analyze a tactical situation in order to identify the critical information needed for decision-making.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA425737>

RR 1825

Measuring Digital Battle Staff Proficiency in Current and Future Forces. (2004). Leibrecht, B.C., Lockaby, K.J., Perrault, A.M., & Meliza, L.L. (DTIC No. ADB301959 / Restricted).

RR 1826

Digital Proficiency Levels for the Brigade and Battalion Battle Staff. (2004). Leibrecht, B.C., Lockaby, K.J., Perrault, A.M., & Meliza, L.L. (DTIC No. ADA425934).

This report results from ongoing work to develop a digital proficiency measurement architecture that includes the battle staff equipped with the Army Tactical Command and Control System (ATCCS). The report first examines primary dimensions of ATCCS-enabled performance, including major system capabilities, high-payoff user skills and tasks, and network management skills. It then explores how ATCCS exploitation contributes to critical staff functions, with an emphasis on integration across Battlefield Operating Systems (BOSSs). The discussion includes findings on brigade versus battalion differences and digital versus analog staff processes. A family of proficiency level matrixes is presented for six major staff sections. Finally, the report discusses implications of the findings for digital proficiency measurement and after action review (AAR) procedures. Altogether the findings point to

high-payoff proficiency targets, paving the way for ATCCS exploitation guidelines and analysis of measurement and AAR requirements for the Future Force. The report includes recommendations for harnessing the knowledge products.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA425934>

RR 1827

Warrior Ethos: Analysis of the Concept and Initial Development of Applications. (2004). Riccio, G.E., Sullivan, R., Klein, G.E., Salter, M.S., & Kinnison, H. (DTIC No. ADA428065).

This research refines and operationalizes the 2003 definition of Warrior Ethos and examines a means for its inculcation into the Army. Specifically, the research considered Initial Entry Training (IET) of enlisted Soldiers as an initial opportunity for the application of potential solutions, although the concepts apply to officer initial military training as well. The U.S. Army Infantry School Task Force Soldier's 2003 definition of Warrior Ethos (Mission First, Never Quit, Never Accept Defeat, Never Leave a Fallen Comrade) was examined, and further broken down into the values-based attributes exemplified by a Soldier who demonstrates Warrior Ethos. Using a theoretical framework, these attributes were linked to specific behavior, the execution of which represented an operationalization of Warrior Ethos as a complex concept. The desirable behaviors, captured in nine Warrior battle drills, were also considered from the standpoint of barriers or friction to their execution. A tentative methodology for training was then postulated.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA428065>

RR 1828

Capabilities of Future Training Support Packages. (2004). Burnside, B.L., & Throne, M.H. (DTIC No. ADM001725 / CD-ROM).

A training support package (TSP) integrates all the information and materials needed for the successful conduct of a training exercise or event. As the Army transforms to the Future Force, the concept of a TSP needs to transform to make TSPs more accessible and adaptable. This report identifies and analyzes five key capabilities needed in future TSPs: rapid tailoring or modification, reach, simulated operating environment, performance measurement, and pretests/selection criteria. The analysis is based on results of a survey of designers of future training and a review of key acquisition documents for Future Combat Systems. The result is a broadened view of the capabilities needed in future TSPs.

RR 1829

LEADDATA: An Assessment Toolkit to Measure Small Unit Leader Cognitive Skills: Phase 1. (2004). Zaccaro, S.J., Wood, G.M., Chiara, J.J., Salas, E., & Burke, C.S. (DTIC No. ADB305239 / Restricted).

RR 1830

Battle Command Visualization 101: Prototype Embedded Training on Networked Sensors. (2004). Lickteig, C.W., Heiden, C.G., & Holden, W.T. (DTIC No. ADA429188).

The anticipated ability of the Future Force to See First requires proactive research to transform the emerging concepts of embedded training and networked sensors into assets. This report documents initial research on an innovative training program to provide small unit commanders the tactical and technical skills needed to exploit networked sensors to meet the See First objective. The research addressed three areas: design of a prototype embedded training program on networked sensors, design of a subset of training exercises for the training program, and development of those exercises in a prototype command and control (C²) system compatible with virtual simulation. Design and development stressed a structured training approach with progressive simulation-based exercises. A representative subset of 20 exercises were developed that focused on exploiting an array of networked sensors on unmanned air vehicles (UAVs) to support the commander's critical information requirements. Results provide lessons learned on technology dependent training that will be used to refine and extend the prototype training on employing networked sensors, and that may apply to the Army's ongoing effort to develop embedded training for the Future Force.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA429188>

RR 1831

Developing Adaptive Proficiency in Special Forces Officers. (2005). White, S.S., Mueller-Hanson, R.A., Dorsey, D.W., Pulakos, E.D., Wisecarver, M.M., Deagle, E.A., & Mendini, K.G. (DTIC No. ADA432443).

Adaptive proficiency is critical for operating in the dynamic Special Forces (SF) mission environment and a recent focus on this requirement has resulted in a greater emphasis on adaptability in current training for SF. This report describes the development of a 3½-day course on adaptability specifically tailored to officers in the SF environment. The course, entitled Officer Adaptive Thinking and Leadership Course (O-ATL), introduces students to the meaning of adaptability in the SF environment, covering the myriad of ways in which SF officers are required to adapt. It focuses particularly on the topics of mental adaptability, interpersonal adaptability, and leading an adaptable team and provides the students with an understanding of each topic's relevance to their SF jobs, as well as tools and strategies for better navigating situations that require these types of adaptability. Recommendations for enhancements of the course and further applications of the course are discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA432443>

RR 1832

Introduction to and Review of Simulator Sickness Research. (2005). Johnson, D.M. (DTIC No. ADA434495).

This report reviews, and explains the research literature pertaining to simulator sickness. Simulator sickness is a form of motion sickness. Consequently, motion sickness is reviewed also. Special emphasis is given to simulator-based flight training—especially helicopter flight training. This review includes the sensory basis of the perception of motion, the terminology of motion sickness and simulator sickness, a selected history of these research fields, sickness signs and symptoms, measurement issues, incidence of sickness, residual aftereffects, adaptation to a novel motion environment, susceptibility factors, performance issues, training issues, safety issues, treatment, theory, guidelines for simulator-based flight training, and suggestions for further research. The sensory conflict theory and the postural instability theory are described insofar as they relate both to motion sickness and to simulator sickness. The effect of simulator sickness on training effectiveness, if any, remains a subject for future applied research.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA434495>

RR 1833

Special Forces Interpersonal Performance Assessment System. (2005). Carpenter, T.D., Wisecarver, M.M., Deagle, E.A., & Mendini, K.G. (DTIC No. ADA434652).

The role of the U.S. Army in the Global War on Terror includes not just war activities but peacekeeping and nation building as well. Soldiers confront complex cultural and political situations that are delicate and unstable. Success in these missions often requires interpersonal skills, enabling Soldiers to accurately perceive multiple perspectives and interact successfully within other cultures. Despite the fact that these skill areas are of great importance, few resources exist to provide Soldiers with information regarding their strengths and weaknesses in these areas, or to provide developmental training activities that could improve these skills. This report describes the development of a model that can serve as a foundation to develop these skills. An evaluation of the model and the application of the model to develop a training program are discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA434652>

RR 1834

Reduced Exposure Firing with the Land Warrior System. (2005). Dyer, J.L., Salvetti, J.D., Vaughan, A.W., Beal, S.A., Blankenbeckler, P.N., & Dlubac, M.D. (DTIC No. ADA435129).

The Land Warrior (LW) system provides the Soldier a new combat capability – the ability to conduct surveillance and to fire from a reduced exposure posture. The day capability is achieved with the daylight video sight; the night capability with the thermal weapon sight. An experiment was conducted to determine the relative lethality of this capability versus standard direct fire techniques. The LW v1.0 system was used. Soldiers who participated in the experiment represented a cross-section of military occupational specialties. Data were obtained on probability of hit, round dispersion, target acquisition, and Soldier exposure to the enemy. Over all the experimental conditions, marksmanship accuracy was reduced somewhat (18% decrease), but Soldier exposure was decreased by 75% compared to direct fire positions and the absolute amount of exposure was small. A training plan was developed that identified the required skills and incorporated the training lessons learned on techniques and firing exercises that facilitate skill acquisition.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA435129>

RR 1835

Soldier Perceptions of the Rapid Decision Trainer. (2005). Beal, S.A., & Christ, R.E. (DTIC No. ADA436993).

This report describes the approach and results of a preliminary evaluation of the Rapid Decision Trainer (RDT), a personal computer-based simulation developed for use by the Infantry Officer Basic Course (IOBC) at Fort Benning, Georgia. The objective of the RDT was to provide each lieutenant with the opportunity to serve as platoon leader while executing a simulated attack mission in preparation for a platoon live-fire exercise. Nineteen lieutenants enrolled in the IOBC were assigned to train with the RDT in one large group. Twenty other lieutenants trained in two-man buddy-teams. After executing the RDT mission, lieutenants in both training conditions participated in an after-action review with a senior instructor. A questionnaire administered to the lieutenants documented their perceptions and opinions of RDT training value, their motivations for training with the RDT, their sense of personal involvement in the simulated mission, and the adequacy of the realism portrayed in the simulation. Following the RDT training, the lieutenants participated in a live-fire exercise. A second questionnaire was administered subsequent to the live-fire exercise after-action review. Regardless of which RDT training condition the lieutenants were in, they endorsed the use of the RDT for the IOBC. They indicated the RDT had training value, they were motivated and involved during the simulated mission, and the realism of simulated battlefield events and actions was adequate for training. The results highlighted a number of issues that were described and will be investigated in future training research for desktop simulations and game-based technologies.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA436993>

RR 1836

Developing an Environment for Exploring Distributed Operations: A Wargaming Example.

(2005). Holden, W.T., Smith, M.L., Conzelman, C.E., Smith, P.G., Lickteig, C.W., & Sanders, W.R. (DTIC No. ADA435131).

Requirements for Future Force operations indicate that planning and wargaming must transition from a collocated, sequential, and staff-centered process to one that is distributed, simultaneous, and commander-centered. The present research developed a course of action analysis (wargaming) environment for exploring the human performance requirements associated with distributed wargaming activities characteristic of Future Force operations. This report describes the design, development, and initial evaluation of the multi-echelon distributed wargaming exercises and simulation tools comprising the wargaming research environment. Key design features of the research environment are identified which serve to rapidly guide command groups through the Action- Reaction-Counteraction wargaming cycle, minimizing the time required to orient participants to the tools, tasks, and background information necessary to wargaming. Four distributed wargaming exercises, including two Horizontal (Staff) and two Vertical (Command) exercises, were conducted with 20 Active Duty Officers – Majors and Captains. Results of the research provide a prototype example of an environment for distributed operations that can support Future Force research and training requirements. The results provide lessons learned for developing a distributed planning environment, including guidelines for the development of structured exercises, requirements for tools that facilitate collaboration, and measures for the assessment of wargaming performance.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA435131>

RR 1837

Training Requirements of Digital System Operators in a Stryker Brigade Combat Team.

(2005). Schaab, B.B., Dressel, J.D., & Hayes, P.B. (DTIC No. ADA436992).

Digital technology allows personnel to connect via digital networks rather than face-to-face. Successful information sharing and collaboration in this environment is critical for mission planning and execution. Soldiers operating the U.S. Army's most advanced digital systems responded to questionnaires and interviews to describe: How they were trained to communicate across systems? What types of training were most successful? What were the consequences of successes and failures in communicating across systems? Results from the data collected can be summarized as follows: Most Soldiers had a basic understanding of their digital system, gained through classroom instruction or on-the-job training, but they seek additional field training. Soldiers need to train on their systems to fully understand its capabilities and so that operation becomes automatic. The Soldiers say that the best training is hands-on experience in a variety of exercises. Soldiers want training using the suite of systems that they must operate and communicate with, and it should be done as a single training unit. Soldiers report that

planning and preparation is much faster using their digital systems and these systems make it much safer for troop movement in enemy territory.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA436992>

RR 1838

Digital C³ Systems: Patterns of Use in an Operational Environment. (2005). Barnett, J.S. (DTIC No. ADA442663).

This report identifies how Soldiers employ digital C3 systems in the field. A set of questionnaires was administered to 11 Soldiers with operational experience with several digital C3 systems. The questionnaire asked Soldiers to rate over 30 C3-related tasks or functions which can be performed using digital C3 systems. Soldiers rated the tasks as to whether they preferred to perform them using digital or manual means, how frequently they used each task, how hard each task was to learn to use, and how hard each task was to use in the field. Results suggest Soldiers use approximately one-half of digital C3 functions "occasionally" or more often, while the other half of available functions are used rarely. The functions used frequently include classic C3 planning and reporting tasks. Of the more frequently used functions, some were rated as easy to learn or use, and some were rated hard to learn or use. There was a significant negative correlation between frequency of use and difficulty using, suggesting Soldiers did not perform some tasks digitally because they were hard to use.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA442663>

RR 1839

Flexible Methods for Future Force Concept Development. (2005). Gossman, J.R., Mauzy, R.P., Heiden, C.G., Campbell, C.H., Flynn, M.R., Lussier, J.W., & Shadrick, S.B. (DTIC No. ADA438191).

One key to the Army's success in transformation will be a solid process for concept development. The Army needs a means to generate, elaborate, refine, describe, test, and validate new concepts relating to doctrine, tactics, techniques, procedures, unit and team organization, job allocation, training, leader development, and other aspects of technology integration. One approach is to construct an environment that transforms the scale in which situations can be presented realistically and to develop, within that environment, a set of tools that can be used to explore selected command group functional performance issues in a methodical fashion. Two tools, a scaled-world tool and a concept-development tool, were designed and developed. In addition, six scaled-world events and 10 concept-development sessions were produced. The scaled-world events and concept-development sessions were formatively evaluated. Based on the evaluation results, it appears that both tools have value for concept identification and concept development. Feedback on both tools was very positive and generally met the project objectives. In addition, future directions for improvements to and use of the synthetic task components are discussed in terms of short-term and long-term requirements and possibilities.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA438191>

RR 1840

After Action Reviews with the Ground Soldier System. (2005). Dyer, J.L., Wampler, R.L., & Blankenbeckler, P.N. (DTIC No. ADA438040).

Soldier System (GSS) could serve as after action review (AAR) aids for trainers during force-on-force field exercises. It also examined what specific additional embedded training features could generate enhanced AAR aids and displays. The GSS is a dismounted Soldier system with a wearable computer. The AAR aids examined were based on automated aids used to support simulation training exercises, principles of graphic displays, and input from observer/controllers (OCs) at the Joint Readiness Training Center. Findings showed that the operational capabilities of the GSS could be used to provide aids that support the trainer's discussion of mission planning and preparation, plus some aspects of mission execution. Yet additional embedded AAR capabilities could expand the pool of potential aids, and more closely appropriate those used with simulations. It was also determined that existing automated aids typically do not address mission planning and execution. The OC interviews reinforced the tenet that the trainer is key to a successful AAR dialogue to help the unit understand what happened, why it happened, and what to sustain and improve.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA438040>

RR 1841

Using Games for Training Dismounted Light Infantry Leaders: Emergent Questions and Lessons Learned. (2005). Beal, S.A. (DTIC No. ADA438042).

The U.S. Army Infantry School has explored the use of PC- and console-based games for training Infantry leaders. There has been a need to examine the effectiveness of training games and to capture lessons that could help shape the development and use of future games. This report presents emergent questions and lessons learned from evaluations of three games designed to train dismounted light Infantry leaders: Full Spectrum Command, The Rapid Decision Trainer, and Full Spectrum Warrior. Results from the evaluations showed that the most effective training experiences occurred when a game was developed to address specific training objectives and needs. Infantry leaders reported to value training to a greater extent when qualified instructors were present to offer feedback during mission execution and detailed after action reviews following training exercises, as opposed to using the game as a stand-alone trainer. Leaders reported that the use of sophisticated graphics did not impact perceived training value, and that training with games for fun and personal entertainment was less important than learning and practicing leader tasks and skills. Leaders also suggested that the ability to modify games over time was necessary to maintain training relevancy.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA438042>

RR 1842

Computer Based Approaches for Training Interactive Digital Map Displays. (2005). Dyer, J.L., Singh, H., & Clark, T.L. (DTIC No. ADA440171).

Five computer-based training approaches for learning digital skills were compared using OSUT and IOBC Soldiers. The pure exploratory condition was the least effective for all Soldiers, particularly those in OSUT. The traditional lesson and exercise combination was effective for all as was the guided-exploratory, problem-solving condition. The condition where Soldiers could select their own mode(s) of training produced different training strategies on the part of the OSUT and IOBC Soldiers. IOBC Soldiers used more consistent and fewer training strategies than did OSUT; this condition was preferred by IOBC. OSUT Soldiers benefited from the more structured environments that provided performance feedback. IOBC Soldiers did not necessarily require exercises, but did benefit from the lesson information and the capability to control their training strategy. The findings reinforce the need to tailor training to Soldiers when the target population is diverse, and common skills and knowledge must be acquired. The results suggest that giving the same training to all is not the most efficient, nor the most effective, nor the most motivating.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA440171>

RR 1843

Multi-Echelon Distributed Army Leaders' Information Support Training 2: Prototype Development and Recommendations for Future Training. (2005). Graves, C.R., Jenkins, S.N., Flynn, M.R., Campbell, C.H., & Shadrack, S.B. (DTIC No. ADA439895).

In the Multi-Echelon Distributed Army Leaders' Information Support Training (MEDALIST) project, researchers examined communication requirements essential to the conduct of battle command in the emerging operational environment and designed a flexible, scalable approach for training those and related tasks in a distributed training environment. The MEDALIST approach comprises a structure of communication drills with varying difficulty levels and scenario settings, targeted training audiences, a distributed performance coaching model, and specifications for a PC-based system that supports delivery of the training. This follow-on to the MEDALIST effort examined the potential to apply the MEDALIST approach to the training of information support activities in the emerging Future Force and Stryker Brigade Combat Team environments. Project objectives included analyzing and modifying the MEDALIST approach to address performance conditions and requirements unique to Future Force and Stryker environments. This report describes the background, objectives, activities, products, and conclusions of the research effort. Intended for Future Force and Stryker Brigade Combat Team training and training system designers, it offers recommendations in the areas of training systems, training processes, and MEDALIST utilization.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA439895>

RR 1844

Training Adaptable Leaders: Lessons from Research and Practice. (2005). Mueller-Hanson, R.A., White, S.S., Dorsey, D.W., & Pulakos, E.D. (DTIC No. ADA440139).

In the post 9/11 environment and the subsequent Global War on Terrorism, the need for adaptable leaders in the military is increasingly apparent. The development of adaptive leaders has become a high priority for the Army; however, current research and practice related to adaptability is still in its infancy. The purpose of this paper is to summarize current theory and research related to developing adaptable

leaders. A discussion of the importance of adaptability in the Army's leadership is presented followed by an exploration of the concept of adaptability. Next, characteristics of adaptable leaders are reviewed along a continuum of trainability. The core of this paper addresses training adaptability in terms of institutional, operational, and self-development interventions. Within each of these areas, practical guidance is provided for designing effective training and development programs, and a summary of areas for future research is presented.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA440139>

RR 1845

Deployment Consequences: A Review of the Literature and Integration of Findings into a Model of Retention. (2006). Wisecarver, M.M., Cracraft, M., & Heffner, T.S. (DTIC No. ADA442677).

Deployment activity for the armed services increased during the 1990s and the deployment tempo continues to be high. This makes understanding the consequences of these deployments for manpower and personnel areas such as retention particularly important. This report summarizes research regarding the effects of deployments, and proposes a framework for understanding the effects of deployments on retention using an existing model of organizational turnover. Results suggested that either too few or too many deployments can have a negative effect on retention, and that while number and length of deployments are important, other characteristics of a deployment such as the perceived fairness of decisions can play an even more important role in Soldier and family reactions to deployments. Survey data has also consistently indicated that the amount of time a Soldier is separated from his/her family is one of the top reasons that Soldiers consider leaving the Army. The effect of deployments on other personnel areas such as morale, finances, and readiness, has been equivocal. We argue that it is imperative to develop a model of retention that demonstrates the role of deployments in the decision to reenlist. We suggest a model and justify the proposed links based on the literature.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA442677>

RR 1846

Training Impact Analysis for Land Warrior Block 2. (2006). Dyer, J.L., Centric, J.H., & Dlubac, M.D. (DTIC No. ADA443795).

A Training Impact Analysis was conducted to support the Analysis of Alternatives (AoA) for the Land Warrior (LW) Block II system. Four equipment alternatives were compared; three varied the basis of issue for the LW: down to squad leader, to fire team leader, and to all Soldiers. Training time, number of instructors and LW systems, and ammunition were estimated for each alternative. The greatest training impact was with the alternative where all Soldiers had a system, due to the substantial increase in number of individuals to be trained as compared to alternatives that involved only leaders. Existing Infantry courses increased in length as core subjects and prerequisite skills could not be deleted from the programs of instruction. Marksmanship and land navigation training were the two individual tasks that had the greatest impact due to the high proficiency level desired by the Infantry School and constraints on throughput created by restrictions in training areas/ranges. The results were included in the 2005 AoA briefing to the Study Advisory Group. The analysis provides a solid base for estimating future training impacts if the LW system is modified, additional data on training times are obtained, or programs of instruction are changed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA443795>

RR 1847

Preliminary Evaluation of a Novel Simulation Based Tool for Training Rapid Decision Making Skills. (2006). Christ, R.E. (DTIC No. ADA443863).

This report describes an initial evaluation of a desktop training tool named the Simulated Field Exercise (SimFX). SimFX is different from other desktop trainers in that it uses a discrete, outcome-driven simulation for training leader decision making rather than a simulation driven by inputs from the virtual operating environment. The training scenarios used in SimFX exploit the cognitive realism that occurs when the leader is engaged in an interactive, branching storyline. The SimFX simulation advances the leader from one decision point to the next, and therefore focuses the leader on making decisions using available information rather than on experiencing the subtleties of a virtual environment. The SimFX was evaluated using the results from a questionnaire completed by 19 participants in a hands-on workshop that was conducted to introduce SimFX to a broad cross-section of trainers and training developers at Fort Benning, Georgia. The findings of this preliminary evaluation of SimFX suggest that it may be both an effective and an efficient means to train information-processing and decision-making skills. Equally

important, the SimFX tool has the capability to be an aid in the development of the cognitive skills required for both the current force and for the envisioned future force environment.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA443863>

RR 1848

Approaches to Managing Future Training. (2006). Campbell, C.H., Campbell, R.C., Gossman, J.R., Graves, C.R., Flynn, M.R. (DTIC No. ADA444537).

This report explores issues related to managing adaptable training in the future, when Future Combat Systems (FCS), embedded training (ET) capabilities, and a full range of personnel management tools are the norm for daily operations. The report first discusses the issues associated with management of future training and related current and emerging Army initiatives, FCS documentation, and previous research findings. The five principal issues concern the vision and expectation for future training; the tools and information that would be needed; how the tools and information could be provided using automated channels; what level of automation users will accept; and the nature of near-term solutions. The concept for a future training management system is described through use cases that detail the use of specific tools and information. Based on analysis of the use cases, technology needs are described in five areas: massive database systems, bi-directional reach (both accessing and sending needed information), sophisticated self-learning search engines, performance support systems and computer-generated simulations powered by artificial intelligence, and super-broad bandwidth. We then present a set of detailed recommendations, including priorities, interim solutions for near-term development, and directions for further research and development in both training and technology realms.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA444537>

RR 1849

Global Teams: Enhancing the Performance of Multinational Staffs Through Collaborative Online Training. (2006). O'Dea, A., Ross, K.G., McHugh, A., Phillips, J., Throne, M.H., McCloskey, M.J., & Mill, J.A. (DTIC No. ADA469425).

This research report describes the research, development, and evaluation of a web-based, scenario-based training tool, designed to support the development of expertise in coordination and decision making for multinational forces in coalition operations. The tool allows discussion and collaborative problem solving between at least two coalition partners, with the support of a facilitator. The project team used the operational experience of officers from English-speaking nations (U.S., U.K., Canada, and Australia) to identify the cognitive challenges inherent in coalition operations and to drive the development of context-rich scenarios. Evaluation of the training highlighted six critical factors which impact the effectiveness of the training. 1. Clarify the learning objectives in advance. 2. Emphasize the problem solving and coordination aspects of the exercise. 3. Capitalize on the opportunity for interaction by allowing partners to interact over discussion and problem solving. 4. Set the training at the appropriate level. 5. Use an experienced facilitator to direct the training. 6. Tie tool functionality to the learning strategy. Overall, the training was shown to improve participants' awareness of, and ability to respond to, the key themes of coalition coordination. The tool provides an easy-to-implement and cost-efficient means for coalition partners to train in a distributed environment.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA469425>

RR 1850

Training Lessons Learned and Confirmed from Military Training Research. (2006). Wampler, R.L., Dyer, J.L., Livingston, S.C., Blankenbeckler, P.N., Centric, J.H., & Dlubac, M.D. (DTIC No. ADA446697).

The report summarizes lessons learned regarding military training that were accumulated over a six-year period of training research. These lessons include new insights regarding training as well as lessons that reinforce basic principles of training and learning. The findings are based on the authors' observations and assessments of training as well as training experiments. Much of the training involved new and emerging training technologies. Some of it focused on training with futuristic equipment. Live, virtual, and constructive training environments were observed. The report integrates the lessons learned and insights regarding training that were documented in prior reports, as well as those that were not officially documented. These lessons should be useful as new equipment is developed and training programs are designed. The report is intended for use by military trainers, training designers, and training developers in institutional training environments and in operational units.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA446697>

RR 1851

Recruitment and Accession of Special Forces Warrant Officers. (2006). Ferro, G.A., Wisecarver, M.M., White, S.S., & McPherson, W.A. (DTIC No. ADA446700).

Special Forces (SF) has had difficulty filling the available training slots in the SF Warrant Officer Basic Course (WOBC). Research was required to analyze factors related to the accession and retention of SF WOs. Four specific objectives were identified that include describing the available target population, describing SF Noncommissioned Officers' (NCOs) opinions regarding the WO position, identifying barriers to recruitment, and providing recommendations regarding future accessions. Analyses indicated that the percentage of SF NCOs that meet the WOBC accession requirements is very small – possibly as low as 2-6% of the SF NCO population. In addition recruitment into the WO program may be hampered by a lack of awareness of the requirements; 52% of survey respondents were not aware of requirements for accession to WOBC. Results also indicated a continued negative view of the SF WO pay structure, with 47% of respondents ranking “fixing pay” as the most important thing the Army could do to encourage NCOs to apply. Finally, results indicated about half of the NCOs have indifferent or negative perceptions of the WO position. Recommendations are provided and recent initiatives that address some of these issues are discussed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA446700>

RR 1852

Improving Troop Leading Procedures at the Joint Readiness Training Center. (2006). Evans, K.L., & Baus, E.A. (DTIC No. ADA450444).

The present investigation sought to measure the quality of troop leading procedures (TLPs) being performed at the Joint Readiness Training Center (JRTC) and to determine the extent to which a job performance aid, the TLPs Guide, might improve the TLPs performance of leaders there. TLPs performance was measured by observer/controllers using the TLPs Checklist, a tool developed specifically for the investigation. Over the course of eight unit rotations at JRTC, 723 checklists were collected and analyzed. On 34 of 39 performance measures, leaders who had access to a TLPs Guide during their missions were found to conduct better TLPs than leaders who did not have access to the Guide. Group differences were found to be statistically significant on 8 of the measures obtained. The efficacy of the TLPs Guide was most apparent when leaders performed the third step in the TLPs process, making a tentative plan.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA450444>

RR 1853

A Near Term Approach to Embedded Training: Battle Command Visualization 101. (2006). Fisher, J.M., Heiden, C.G., Gossman, J.R., Campbell, C.H., Breidenbach, M.G., & Lickteig, C.W. (DTIC No. ADA449032).

Design and development of embedded training (ET) has been hampered by technical barriers and a lack of viable training product exemplars. This report describes an innovative training product developed to complement the Army's ongoing ET efforts for the Future Force and provide realistic training solutions for the Current Force wherever deployed. An exemplar product called Battle Command Visualization (BCV) 101 was developed to train many of the basic skills required for employing networked sensors to “see” the battlefield by completing a set of progressive and gated skill development and reinforcement exercises. Expert performance of the exercises on a prototype command and control (C²) system linked to virtual simulation was recorded to generate high-fidelity source materials for interactive multimedia instruction (IMI) at IMI Levels 1 and 2. The source materials were augmented by teaching points, tactical and reference materials, and quizzes. A surrogate learning management system was developed to control exercise sequence, interaction, quiz administration, training feedback, and remediation. Limited formative evaluation was also conducted. The primary finding of the research is an innovative approach to training that markedly extends Army's ability to deliver the high-fidelity training required by the Current and Future Force.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA449032>

RR 1854

Behaviorally Anchored Rating Scales for the Assessment of Tactical Thinking Mental Models. (2006). Phillips, J., Shafer, J., Ross, K.G., Cox, D.A., & Shadrack, S.B. (DTIC No. ADA452068).

Report developed under a Broad Agency Announcement (BAA) # W74V8H-04-C-0018. An ongoing need exists in the Army to enhance combat leaders' tactical thinking skills. In conjunction, measurement

techniques must be developed to assess tactical thinking skills. This report documents an effort to develop a standardized and reliable assessment tool for purposes of evaluating training applications, diagnosing individuals' levels of cognitive proficiency, and examining the impact of advanced battle command technologies on user cognition. Four Tactical Thinking Behaviorally Anchored Rating Scales (T-BARS) were developed. They enable researchers to measure cognitive proficiency along critical dimensions of tactical thinking by coding behaviors that are observable in the context of training sessions, exercises, or experiments. Themes of tactical thinking identified in the Think Like a Commander program formed the basis of T-BARS. The Dreyfus & Dreyfus (1986) stage model of cognitive skill acquisition guided construct development for five levels of tactical thinking proficiency within each scale. Interviews were conducted with Army officers to elicit patterns of thinking and behaviors in tactical exercises. Interview data informed the behavioral descriptors generated to populate the levels of cognitive performance within the T-BARS. Scale development occurred iteratively with interrater reliability testing. The finalized T-BARS assessment tool is accompanied by a user guide to support its application.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA452068>

RR 1855

Army Green: Training Non-Tactical Problem Solving by Platoon Leaders. (2006). Hinkle, R.K., Karrasch, A.I., & Thomas, J. Burke, T.J. (DTIC No. ADA454772).

Platoon leaders (PL) are often required to resolve non-tactical problems on which they have received little to no formal training. Many of these non-tactical problems are atypical, undocumented, and require judgemental resolution by PLs with limited experience as they take command of their first platoon. In addition, the unpredictable nature of military operations including non-tactical situations requires PLs to repeatedly adapt their thinking to resolve unfamiliar, and sometimes unforeseeable, problems and concerns. Therefore, the 16th Cavalry Regimental Commander requested Technical Advisory Service to develop non-tactical training for new PLs. In response, methods for theme-based training used to train adaptive thinking in tactical situations from the Think Like a Commander (TLAC) program were adapted for non-tactical situations and the development of a training program called Army Green. Through a series of interviews and surveys, 231 captains and lieutenants (LT) identified values, problems, and situations relevant to the non-tactical issues that confront PLs. As a result, 10 themes and 10 problem-laden vignettes along with expert solutions were developed for Army Green. An Army Green training assessment with 12 LTs resulted in promising, but preliminary findings that indicated a few hours of theme-based discussion of problems embedded in non-tactical vignettes improved LTs' responses to subsequent problems. The report concludes with a brief set of recommendations to help refine and implement Army Green training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA454772>

RR 1856

Development of the Reactive Planning Strategies Simulation. (2006). Sanders, W.R., Fultz, C.V., & Sharp, N.K. (DTIC No. ADA454775).

The present report describes the development of the Reactive Planning Strategies Simulation (REPSS), and the results of initial experimentation comparing the performance of distributed and co-located groups. The REPSS presents a simplified collaborative planning task where a commander and three teams organize relief mission convoys to four towns as part of a stability and reconstruction operation. The research supports the Leader Adaptability Army Training Objective (ATO) which seeks to provide prototype computer-based methods and tools to rapidly train and sustain fundamental leadership and battle command skills required as increasingly complex command and control technologies and networks become operational. With regard to the planning process, the comparison of co-located and distributed groups showed clear differences in verbal and text-messaging communications. Automated measures of team planning synchronization and quantity of goods delivered provided some evidence that the co-located groups were better at achieving the goal of maximizing the delivery of required supplies consistently across the four towns. A majority of participants (93%) indicated that the REPSS planning exercise could be useful in command group training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA454775>

RR 1857

The Implementation of User Juries in the Development of Future Systems. (2006). Throne, M.H. (DTIC No. ADM001911 / CD-ROM).

As the Army develops and fields the Future Combat Systems, one of the methods that will be implemented to ensure this complex system of systems meets Soldiers' needs is user juries. For the purposes of this report, a user jury is defined as a group of experts or potential users who review an evolving system (or product) either individually or as a group, evaluate the system with guidance from a facilitator, and provide structured feedback to developers for system improvements. The primary objective of this research effort was to gather the information available on user juries and develop some guidelines for implementation. Information was gathered through reviews of the literature, as well as interviews with training developers. Then, in an initial attempt to apply the guidelines to user jury research, a prototype website dedicated to user juries was developed (see CD). Ideas for future research are also provided.

RR 1858

Tailored Exercise Planning and Feedback for Digitized Units. (2006). Leibrecht, B.C., Lockaby, K.J., Perrault, A.M., Strauss, C.P., & Meliza, L.L. (DTIC No. ADB320414 / Restricted).

RR 1859

A Simulation Based Tool to Train Rapid Decision Making Skills for the Digital Battlefield.

(2006). Archer, R., Brockett, A.T., McDermott, P.L., Warwick, W., & Christ, R.E. (DTIC No. ADA457395).

This report was developed under the Army Phase II Small Business Innovation Research (SBIR) program. The Simulated Field Exercise (SimFX) tool was designed to help small unit leaders make good decisions while immersed in an ever widening array of information technologies. Rather than focus training on the specifications and capabilities of new technologies, we provide students with computer-based scenarios that force them to resolve ambiguous or contradictory input from remote sensors, fuse disparate sources of information, filter information, and manage resources. SimFX exploits the cognitive realism that comes from engaging a trainee in a branching story in which the trainee must make a series of decisions that ultimately affect how the story plays out. The consequences and feedback are predicated not just on the alternative chosen but on the information sources used to make the decision. Thus, emphasis is placed on the student's ability to collect and use information. Six consists of two components: the Player presents a scenario to the trainee and the Author allows training developers to create story-based scenarios or deliberate practice exercises. SimFX is a low-cost, easy to use training tool that has been favorably received by potential users in the Army training community
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA457395>

RR 1860

What Squad Leaders Want to Know in Battle. (2006). Evans, K.L. (DTIC No. ADA457179).

The Battlefield Information Questionnaire was developed to measure the relative importance of 88 different types of battlefield information to squad leaders in four combat situations: planning, assaulting an objective, consolidating and reorganizing on the objective, and defending the objective from counterattack. This questionnaire was then administered to a group of 106 noncommissioned officers, each having combat experience as a squad leader. The types of information they most wanted to know, and least wanted to know, were highly consistent across combat situations. Averaged across situations, the ten types of information most important to squad leaders in battle were: location of threat personnel, vehicles, and weaponry; casualty collection point location; ammunition remaining; location of personnel in their squad; location of units in contact with the enemy; personnel location in adjacent friendly units; their own location relative to other personnel; location of mines, obstacles, booby traps, and improvised explosive devices; availability of supporting fires; and direction of movement for enemy personnel.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA457179>

RR 1861

Sexual Harassment and Assault: Research Review and Recommendations. (2006). Fitzgerald, L.F., Ormerod, A.J., Collinworth, L., Lawson, A.K., Lytell, M., Perry, L.A., Wright, C.V., & Babin, N.E. (DTIC No. ADB320314 / Restricted).

RR 1862

Assessing Army Professional Forums: Metrics for Effectiveness and Impact. (2006). Cianciolo, A.T., Heiden, C.G., & Prevou, M.I. (DTIC No. ADA464632).

The rate of change in the operational environment outpaces the development of doctrine and schoolhouse instruction, leaders must direct their own development in order to adaptively and professionally meet the challenges brought on by Army transformation. Army professional forums

(APFs), powered by advances in collaborative toolsets and multimedia presentation software, provide a means for leader self-development and professional growth. The research was conducted as an initial exploration of this area. The early stages of this initiative present the most valuable opportunity to establish checks that ensure the initiative is functioning effectively and meeting organizational goals. Establishing such checks enhances the organizational impact of the initiative. The APF assessment framework developed in the present research enables the assessment of APFs during the early stages of the Army knowledge-management initiative.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA464632>

RR 1863

Training and Leadership Insights from Veterans of Iraq and Afghanistan: 2003 – 2004. (2006). Goodwin, G.A., Dyer, J.L., & Centric, J.H. (DTIC No. ADB323299 / Restricted).

RR 1864

The Training, Retention, and Assessment of Digital Skills: A Review and Integration of the Literature. (2006). Goodwin, G.A. (DTIC No. ADA470707).

Skill training, retention, and assessment research from academia, industry, and the government is reviewed and its implications for digital skill training are discussed. Factors that affect digital skill retention are procedural (e.g., the timing and sequencing of training trials, training techniques employed), individual (intelligence or background knowledge), and task related (e.g., the number of steps per task, the cognitive difficulty of selected steps). Some of these factors have also been shown to impact digital operator training, but additional research needs to be done. Few experiments have made broad comparisons across all variables or have effectively quantified ways to evaluate or design effective digital training. Recommendations about how to modify specific digital courses should therefore attempt to validate those changes empirically. Much less work has been done in the area of collective digital training despite the fact that this comprises the majority of the training prescribed in the Army Digital Training Strategy. Research on the assessment of digital skills has produced a number of tools and procedures for assessing digital skills for both individual and collective training. Many of these tools have been well received by units who have used them but the tools still need to be formally validated.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA470707>

RR 1865

Performance in Non-Face-To-Face Collaborative Information Environments. (2007). Schaab, B.B., Dressel, J.D., Sabol, M.A., & Rittman, A.L. (DTIC No. ADA464628).

Using technology to obtain and process information requires training not only in human-computer interaction but also in human-human-computer (collaborative) interaction. Warfighters must not only develop their own situational awareness (SA), they must understand each other's' SA (Pew, 1995). This common ground is what each collaboration participant assumes about the others to ensure effective interactions (Ross, 2003; Wellons, 1993). Communication is key. Collaborators must coordinate and share information. Collaboration influences military operations at all levels. Technical interoperability is not enough to produce the synchronization required.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA464628>

RR 1866

A Case for Decentralized Training. (2007). Dyer, J.L., Centric, J.H., & Wampler, R.L. (DTIC No. ADA462739).

The report summarizes how and why the Army moved to a centralized training strategy, where training is planned and controlled by company or higher headquarters. Information is presented on how the Opposing Force (OPFOR) at the Joint Readiness Training Center (JRTC) has implemented a decentralized approach to training, where training is planned and executed at the squad or platoon level. This strategy fits well into the OPFOR's decentralized mode of operations. Interviews with 14 OPFOR members provided key insights into what makes decentralized training work and how to use that approach to attain trained Soldiers and leaders. The OPFOR also indicated that both centralized and decentralized training are needed in units as they are complementary modes of training. Five critical factors essential to ensure a decentralized training program can be successfully implemented are outlined. These are selecting tasks that are appropriate to be trained in a decentralized mode, using qualified trainers, creating an environment conducive to this type of training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA462739>

RR 1867

After Action Reviews: Current Observations and Recommendations. (2007). Salter, M.S., & Klein, G.E. (DTIC No. ADA463410).

The purpose of this research was to examine the conduct of After Action Reviews (AARs) at the Combat Training Centers (CTCs). The CTC selected was the Joint Readiness Training Center (JRTC) where the likelihood of small unit leader involvement in decision-making situations has increased, bringing a heightened importance to lower level AARs. In cooperation with the JRTC Operations Group, researchers examined both platoon and company AARs. The results confirm earlier research that shows the AAR is both a science and an art. Even the best-trained Observer/Controllers (O/Cs) tend to err on the side of providing too much information. Facilitating a discussion rather than a lecture is a skill that must be developed and reinforced in training and in practice. Recommendations are included, as well as a prototype AAR rating scale that could be used as a job aid, performance checklist, or as an instructional tool during O/C training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA463410>

RR 1868

Accelerating the Development of Adaptive Performance: Validating the Think Like a Commander Training. (2007). Shadrack, S.B., Lussier, J.W., & Fultz, C.V. (DTIC No. ADA464668).

The contemporary operational environment and the Global War on Terrorism require junior leaders in the U.S. Army to exhibit high levels of adaptive performance. This research examined whether or not the tactical environment of Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) contributes to the development of more adaptive leaders. In addition, the level of adaptive thinking for lieutenants, captains, majors, and lieutenant colonels was investigated. The results revealed that leaders with OIF or OEF experience performed better on a test of adaptive thinking, and that performance increases with rank. The results support the validity of the adaptive thinking measurement instrument and the relevance of the Think Like a Commander training program. In addition, the results suggest that deliberate training methods may be more effective and efficient than live, virtual, or constructive experiential learning environments.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA464668>

RR 1869

Assessment of Two Desktop Computer Simulations Used to Train Tactical Decision Making of Small Unit Infantry Leaders. (2007). Beal, S.A. (DTIC No. ADA468772).

Fifty-two leaders in the Basic Noncommissioned Officer Course (BNCOC) at Fort Benning, Georgia, participated in an assessment of two desk-top computer simulations used to train tactical decision making. Thirteen leaders trained with the Soldier Visualization Station (SVS) simulation, while 39 others trained with Simulation Exercise, or SimFX. Pre-simulation exercise measures included military and simulation experience, decision-making style, and tactical situation judgement. A questionnaire administered to leaders following simulation exercises documented their sense of personal involvement during mission execution and their perceptions of the training value of the simulations. Leaders in both groups were assessed individually for their ability to recognize and implement sound tactical decisions while serving as a squad leader of a light Infantry squad during patrol and defense missions in an urban environment. Results suggest that, in general, the use of desk-top simulations have potential value for training the tactical decisions leaders make during exercises that require greater expenditures of resources. However, the methods used to train with simulations impacted leaders' tactical decision making, their perceptions of the training value of simulations, and their ideas about what they learned from the experience.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA468772>

RR 1870

The Application of a Model of Adaptive Performance to Army Leader Behaviors. (2007). Tucker, J.S., Gunther, K.M., Pleban, R.J., Goodwin, G.A., & Vaughan, A.W. (DTIC No. ADA469726).

The present research sought to better define the junior Army leader behaviors reflecting adaptive performance and offer recommendations for enhancing these adaptive capabilities. Pulakos and colleagues' (2000) eight-dimension model of adaptive performance was applied to leader behaviors performed in operational and training contexts. The present research also included White and colleagues' (2005) Leads an Adaptable Team dimension. Interview data from two different archival datasets were examined. Results showed that the majority of the incidents generated by leaders in

operational contexts reflected two dimensions of the model: Deals with Uncertain and Unpredictable Work Situations and Handles Emergencies or Crisis Situations. Many of the remaining incidents tapped three other dimensions: Solves Problems Creatively, Learns Work Tasks, Technologies, and Procedures, and Handles Work Stress. For the trainers, the majority of the incidents tapped three dimensions of the model: Solves Problems Creatively, Leads an Adaptable Team, and Deals with Uncertain and Unpredictable Work Situations. For both research projects, the model sufficiently addressed the adaptive capabilities described in the critical incidents when it was modified to include specific military leadership behaviors. However, not all of the dimensions were represented in each sample. Differences in the adaptive capabilities between the two research projects are most likely due to the limitations of the training research project. Recommendations for developing training programs aimed at maximizing adaptive performance are discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA469726>

RR 1871
Developing Army Leaders Across Components: Assessing Knowledge Similarities and Differences. (2007). Taylor, T.Z. (DTIC No. ADA469719).

More than ever, it is critical that Army leaders are able to perform leader responsibilities with a high degree of expertise in a variety of skill-sets. Army leaders must demonstrate intrapersonal, interpersonal and organizational expertise in technical, tactical, and leader tasks under ambiguous and constantly changing conditions. Leaders develop their skills through a well-developed system of formal institutional training, experience gained through operational assignment and self-development. However, despite the Army's comprehensive, methodical and standardized system for developing leaders, some are more effective than others. Recent research has explored how knowledge, specifically tacit knowledge, makes leaders more effective. That research was oriented on active Army officer tacit knowledge; this research seeks to measure differences in tacit knowledge levels between active (AC), U.S. Army Reserve (USAR) and Army National Guard (ARNG) officers. In the spring of 2004, 666 ARNG, USAR, and AC Lieutenants, Captains, and Majors were surveyed to measure their tacit knowledge as well as their capacity for self-knowledge. Results showed that there are differences in levels of tacit knowledge between the three Army components, as well as a correlation between individual tacit knowledge and the person's ability to self-assess their own knowledge strengths and weaknesses. Findings in this research can be used to enhance leader development programs by expanding levels of tacit knowledge to facilitate shared mental models of effective leadership in all Army leaders.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA469719>

RR 1872
Retention of Selected FBCB2 Operating Skills among Infantry Captains' Career Course Students. (2007). Goodwin, G.A., Leibrecht, B.C., Wampler, R.L., Livingston, S.C., & Dyer, J.L. (DTIC No. ADA470741).

This report describes an investigation of the retention of Force XXI Battle Command Brigade and Below (FBCB2) operator knowledge and skills. Infantry captains who attended a two-day training course participated in an end-of-course test followed by a retest eight weeks later. Participants answered questions about and performed tasks on FBCB2. Performance on the knowledge test showed no decay while performance on the hands-on test declined slightly (10%), but significantly. The majority of participants (72%) had used FBCB2 in combat. Interestingly, the best single predictor of performance on the hands-on test was a self-reported measure of general computer experience. In general, though, it was difficult to predict performance on the hands-on test. Multiple regression analyses using a variety of experience and knowledge measures accounted for only 25-30% of the variability in recall scores. Implications of these findings for trainers, training developers, and Army units are discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA470741>

RR 1873
Positive Transfer of Adaptive Battlefield Thinking Skills. (2007). Shadrack, S.B., Crabb, B.T., Lussier, J.W., & Burke, T.J. (DTIC No. ADA470215).

Over the past decade the U.S. Army has identified an emerging need to train and develop leaders who are more adaptive and capable of responding effectively to a wide range of military operations. In response, the U.S. Army Research Institute for the Behavioral and Social Sciences has developed the Think Like a Commander (TLAC) training approach that utilizes the principles of deliberate practice to train Army officers in adaptive battlefield thinking. This research demonstrates that the training received in TLAC transfers to other tasks related to battle command, namely the production of a company level

Operations Order (OPORD). Specifically, students enrolled in the Armor Captains Career Course who received TLAC training produced better OPORDs than students who did not receive TLAC training but who did engage in traditional tactical decision games. These results reinforce the continued use of TLAC in institutional, self-development, and unit training.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA470215>

RR 1874

Social Awareness and Leader Influence: A Proposed Model and Training Intervention.

(2007). Mueller-Hanson, R.A., Swartout, E.C., Morewitz, C.L., Keil, C.T., McGonigle, T.P., Martin, C., Parish, C., & Morath, R.A. (DTIC No. ADA472179).

A leader's ability to influence others is likely related to the leader's level of social awareness (knowing how one is perceived by others in that environment). Based on perceptions of the social environment, a leader must also alter behaviors as needed to more effectively relate to others, a process which has been termed "interpersonal adaptability". Interpersonal adaptability is central to the role of the leader who must use influence and persuasion to successfully accomplish the mission through the work of subordinates. The objectives of this research are to develop a model of social influence, to propose training, and to pilot test the concepts. To meet these objectives, we first provide an overview of the relationship between social awareness and influence. Second, we describe a model of social awareness and influence. Third, we describe how these concepts link to the leader competencies defined in FM 6-22. Next, we discuss implications of this research for training leaders to enhance their social awareness and influence skills, and we present the concepts that were developed for training these skills. Finally, we describe how these concepts were pilot tested, and we present the results and our conclusions from the pilot.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA472179>

RR 1875

Development and Content Validation of Crisis Response Training Package Red Cape: Crisis Action Planning and Execution. (2007). Shadrack, S.B., Schaefer, P.S., & Beaubien, J. (DTIC No. ADA472136).

Military and civil crisis response organizations need training which accelerates the development of expertise in effective and efficient interagency cooperation and collaboration. The development of such training necessitates the use of a cognitive task analysis (CTA) method which can draw upon distributed expertise to understand not only current but future task conditions. A newly developed CTA method known as the Flexible Method of CTA (FLEX) was applied to the domain of crisis response and resulted in the training program known as Red Cape: Crisis Action Planning and Execution. Quantitative assessments of the training content validity were elicited from seasoned crisis response personnel. Analysis of the assessments supports the use of FLEX in developing crisis response training. Proposed extensions and refinements of existing content validation procedures are also discussed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA472136>

RR 1876

Platoon Aid for Collective Employment of Robotic Systems. (2007). Durlach, P.J. (DTIC No. ADA472135).

This report presents guidance to help train platoons equipped with organic unmanned systems. The Army currently is supplying platoons with both prototype and commercially available unmanned systems to evaluate military utility and to develop tactics, techniques, and procedures; however, the training provided prior to these "experiments" focuses almost entirely on individual operator training. While different unmanned systems require different detailed procedures, there are certain aspects of operation applicable across systems, and training could be given on these system-general aspects of employment. The purpose of this report is to (1) lay out these system-general aspects and (2) suggest a list of activities to focus on to help train system integration. Each activity has associated observations and related after-action review questions applicable to both air and ground assets, and avoiding the particulars of any specific system. Trainers will not have the opportunity to become conversant with the specifics of the myriad of systems they may encounter. Besides being system-general, the training guidance provided is also mission-general. It suggests appropriate observations and questions to facilitate coaching and after action review discussion specifically with respect to system employment.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA472135>

RR 1877

Winning the War and the Relationships: Preparing Military Officers for Negotiations with Non-Combatants. (2007). Nobel, O.B., Wortinger, B., & Hannah, S. (DTIC No. ADA472089).

Current operations in Iraq and Afghanistan involving counterinsurgency, peace-keeping, stability and support missions and nation building have increased interest in cross-cultural negotiation skills as a central component of military leadership. This report develops a conceptual framework capturing the unique characteristics of negotiations between military personnel and local civilians that can guide the design of negotiation training programs for officers preparing to deploy. Interviews were conducted with 20 Lieutenants and 16 Captains who returned from deployments to Iraq. Content analysis indicated that negotiations with civilians focused largely on rebuilding projects, security, and civil affairs issues. Key challenges reported by officers included 1) the need to negotiate and mediate in the face of sectarian loyalties, 2) ethical dilemmas, 3) the development of work arrangements in the face of conflicting cultural values and behavioral norms, 4) negotiating in the face of threat and determining the appropriate use of power, 5) emotional self-regulation, and 6) adaptive response to a wide range of conflicting responsibilities. Iraqi negotiation techniques appeared consistent with non-Western cultural expectations of the goals and tactics of negotiation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA472089>

RR 1878

Techniques and Practices in the Training of Digital Operator Skills. (2007). Leibrecht, B.C., Goodwin, G.A., Wampler, R.L., & Dyer, J.L. (DTIC No. ADA474556).

This report presents research on classroom training practices in Army Battle Command System courses. The investigation examined a sample of institutional courses using observation and classification techniques. Three learning theories—behaviorist, cognitive, and constructivist—guided the collection and analysis of data. Cognitive and behaviorist training techniques were observed somewhat more frequently than constructivist techniques. The frequency of training techniques depended on the type of course (operator vs. leader orientation), instructor style, and progression across days. The discussion offers potential improvements in the areas of training techniques, program of instruction, training environment, and instructional innovation. The report is intended for use by training designers and developers, digital trainers, and training managers working in institutional settings.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA474556>

RR 1879

Unit Information Management Practices at the Joint Readiness Training Center. (2007). Evans, K.L., Reese, R.P., & Weldon, L. (DTIC No. ADA476071).

The present investigation sought to quantify unit information management (IM) practices at the Joint Readiness Training Center (JRTC) and to determine the extent to which a job performance aid, the IM Guide, might improve unit IM performance. IM practices were measured by observer/controllers using the IM Checklist, a tool developed especially for the investigation. Over the course of seven unit rotations at JRTC, 758 checklists were collected and analyzed. The IM Guide was found to be of benefit to companies, but not to either battalions or platoons. Overall, units were able to address specified information requirements fairly well, though they had much greater difficulty answering implied requirements. In terms of information quality, units were better at providing accurate and reliable information than they were at providing complete and precise information. Units that included IM in their planning process and units that rehearsed their communication plans were more likely to have IM that enhanced mission accomplishment than units that did not do those two things.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA476071>

RR 1880

Computerized Training in Critical Thinking²: A Skill Based Program for Army Personnel. (2008). Fischer, S.C., Spiker, V.A., Harris, D.H., McPeters, E.R., & Riedel, S.L. (DTIC No. ADA494961).

This report describes the development and assessment of Web-based training in critical thinking (CT) for Army personnel. The primary product of this research program was easily distributed and accessible training in CT. The development of the training was supported by preliminary research that reviewed the research literature in critical thinking, developed a model of critical thinking, identified high impact CTS for Army personnel, and developed a prototype training system for two critical thinking skills (Fischer, Spiker, & Riedel, 2008 a,b,c). This report documents the development and evaluation of an expanded version of the training which provides training for eight critical thinking skills. A user-centered design

process, which included four formative evaluations, was used to ensure that the resulting training and assessment products were usable, useful, and well accepted by potential training populations. The effectiveness of the resulting training system was evaluated in two additional investigations. The results of both evaluations indicated that the training improved participants' skills on the two critical thinking skills that were evaluated.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA494961>

RR 1881

Critical Thinking Training for Army Officers. Volume 1: Overview of Research Program. (2008). Fischer, S.C., Spiker, V.A., & Riedel, S.L. (DTIC No. ADA494960).

This report is the first of three volumes describing a multi-year research program to develop and validate web based training in critical thinking for Army officers. This first volume presents an overview of the research efforts that developed and validated a theoretical model for the training, selected and validated eight high impact critical thinking skills for Army officers, and developed and evaluated the training course. The report documents the systematic approach that was used to develop a computer based, on-line, training program designed to promote CT in Army officers. Volume two of this series presents, in more detail, the model and theoretical basis for the training and the experiments that were conducted to validate the model. Volume three describes a prototype training system for two critical thinking skills, including the functional requirements, pedagogical principles, course content, and evaluation of the training. A fourth report describes an expanded version of the system that was developed to train eight critical thinking skills.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA494960>

RR 1882

Critical Thinking Training for Army Officers. Volume 2: A Model of Critical Thinking. (2009). Fischer, S.C., Spiker, V.A., & Riedel, S.L. (DTIC No. ADA494959).

This report is the second of three volumes describing a multi-year research program to develop and evaluate web based training in critical thinking for Army officers. The first volume presents an overview of the research effort that developed and validated a theoretical model for the training, selected and validated eight high impact critical thinking skills for Army officers, and developed and evaluated the training course. This volume describes the results of a literature review on critical thinking, a model of critical thinking that forms the theoretical basis for the training, and investigations that were conducted to validate the model. Volume Three describes a web-based prototype training system that trains two critical thinking skills. Included in Volume Three are a description of the functional requirements, pedagogical principles, course content, and evaluation of the training. A fourth report (Fischer, Spiker, & Riedel, 2008) describes an expanded version of the training system that provides training for eight critical thinking skills for Army officers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA494959>

RR 1883

Critical Thinking Training for Army Officers. Volume 3: Development and Assessment of a Web-Based Training Program. (2009). Fischer, S.C., Spiker, V.A., & Riedel, S.L. (DTIC No. ADA494970).

This is the third volume of a three-volume report describing a multi-year research program to develop and validate web based training in critical thinking for Army officers. The first volume presents an overview of the research effort that developed and validated a theoretical model for the training, selected and validated eight high impact critical thinking skills for Army officers, and developed and validated the training course. The second volume describes, in more detail, the model and theoretical basis for the training and the investigations that were conducted to validate the model. This, the third volume, describes the prototype training system that was developed for two of the skills, including the functional requirements, pedagogical principles, course content, and evaluation of the training. A succeeding report (Fischer, Spiker, Harris, McPeters, & Riedel, 2008) describes an expanded training system which provides training for eight critical thinking skills for Army officers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA494970>

RR 1884

Exploring the Potential Value of OneSAF at the Small-Unit Level. (2008). James, D.R., Dyer, J.L., & Wampler, R.L. (DTIC No. ADA480202).

OneSAF (one semi-automated force) provides intelligent, doctrinally-correct behaviors representing the modular force in the contemporary operating environment. The research determined the extent to which OneSAF (v1.0) could assist company and platoon leaders with tactical planning and assessed the potential value of using OneSAF in institutional training to train course of action (COA) development, analysis, and comparison. U. S. Army officers with combat experience participated. A Quick Start Guide was developed to assist with hands-on training during the experimental sessions. Results indicated that OneSAF could be a useful tool in training mission planning to company-level officers during institutional courses. OneSAF features were perceived to assist with learning COA development, analysis, and comparison, and to support the major factors viewed as valuable in operational planning. The major challenge to future versions of OneSAF is to make it easier to use and quicker to develop scenarios, while simultaneously maintaining the in-depth simulation features.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA480202>

RR 1885

Training Effectiveness Assessment of Red Cape: Crisis Action Planning and Execution. (2008). Schaefer, P.S., Shadrack, S.B., Beaubien, J., & Crabb, B.T. (DTIC No. ADA480003).

The crisis response training program Red Cape: Crisis Action Planning and Execution uses theme-based training and multimedia scenarios to instill expert thinking patterns in crisis response personnel. The training program was assessed in workshops conducted with the Army National Guard. Quantitative data indicate that cognitive performance—as reflected in both independent and self assessments—improves as a function of training. Furthermore, as training progressed, inflation in self-assessments decreased, indicating more accurate self-assessment of cognitive performance. Participant feedback from the participants indicates that the training program was seen as useful, efficient, and effective in improving crisis response cognitions.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA480003>

RR 1886

Collaborative Planning in Network Enabled Co-Located and Distributed Environments. (2008). Sanders, W.R., & Fultz, C.V. (DTIC No. ADA479998).

A defining feature of Army transformation will be the development of digital communications capabilities to support distributed battle command. To support new equipment development a realistic planning task is required which can yield an objective planning performance benchmark score. The Reactive Planning Strategies Simulation (REPSS) presents a group planning and resource allocation task that can be used to generate a benchmark performance score. The present research investigated whether a benchmark REPSS performance score could be established that demonstrates sensitivity to manipulations in planning task conditions, and planning group skills. Twenty-two groups of seven Soldiers (commander and three two-person teams) performed the REPSS planning task after being assigned to either a co-located or distributed team planning condition. Results indicated that the planning performance success score for groups in the distributed condition fell below the benchmark score for groups in the co-located condition. Participant group member characteristics (rank, planning experience, and previous deployments) were significantly related to successful performance for groups in the distributed planning condition. These results provide evidence that the REPSS simulation can be applied to develop a benchmark estimate of performance against which manipulations in task conditions and planning group expertise can be compared.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA479998>

RR 1887

Fidelity Requirements for Army Aviation Training Devices: Issues and Answers. (2008). Stewart, J.E., Johnson, D.M., & Howse, W.R. (DTIC No. ADA493584).

The Future Aviation Simulation Strategies Study Group, sponsored by the U.S. Army Aviation Warfighting Center Directorate of Simulation, presented key questions to the Army Research Institute (ARI) regarding functional requirements (visual, motion, aerodynamic model) for Army helicopter simulators. The present report consists of ARI's responses to these questions, based upon current knowledge of the research. Among the key findings of the report: The prevailing institutional belief is that the simulator, in order to be training effective, must replicate the aircraft. Training consists of

offloading flight hours from aircraft to simulator. These assumptions are not supported by scientific evidence. The belief that fidelity equals training effectiveness still drives the acquisition and integration of simulators and training devices. Empirical transfer of training (ToT) experiments using aircraft as criteria are rare. Research has demonstrated that even high fidelity simulators can produce poor ToT to the aircraft, when traditional lock-step training programs are used. Contrariwise, simulators of lesser fidelity have demonstrated acceptable ToT when criterion-based training strategies were employed. The conclusion drawn from the ToT research is that instructional strategies are more important than simulator fidelity. Research on simulator motion shows that while motion may enhance performance in the simulator, it does not seem to impact transfer to the aircraft.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA493584>

RR 1888

Combat Veterans' Use of Force XXI Battle Command Brigade and Below. (2009). Bink, M.L., Wampler, R.L., Goodwin, G.A., & Dyer, J.L. (DTIC No. ADB347437 / Restricted).

RR 1889

Training Situation Awareness and Adaptive Decision Making Skills Using a Desktop Computer Simulation. (2009). Pleban, R.J., Tucker, J.S., Johnson, V., Gunther, K.M., & Graves, T.R. (DTIC No. ADA494799).

This report describes research designed to: 1) determine the feasibility of a low-fidelity desktop computer simulation called Simulation Field Exercise (SimFX) to train small unit leader situation awareness (SA) and adaptive decision-making skills; and 2) assess the effectiveness of a training protocol consisting of advance organizers (information to familiarize individuals in the areas of SA and the application of key leader processes to facilitate decision-making) and formative, process oriented feedback. Thirty-five Infantry junior officers were randomly assigned to either an experimental or control condition. The Soldiers, role playing a dismounted Infantry Platoon Leader, conducted three mission scenarios reflecting current operations. Adaptive decision-making capability and SA were assessed for each mission. The experimental group obtained significantly higher adaptive decision-making scores than those in the control group. SA and adaptive decision-making scores were significantly correlated for scenarios 1 and 2 such that higher adaptive responding was associated with higher SA ratings. The experimental group used significantly more assets (a measure of SA) than the control group. Strategies for enhancing the training effectiveness of low-fidelity desktop computer simulations such as SimFX are described. SimFX refinements are identified for application to large classes with high student throughput.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA494799>

RR 1890

Assessment of Special Forces Noncommissioned Officer Field Performance. (2009). Ferro, G.A., Cracraft, M., & Ford, M. (DTIC No. ADB353381 / Restricted).

RR 1891

Identifying the Training Challenges and Needs of Deploying Units. (2009). Sanders, W.R., & Schaefer, P.S. (DTIC No. ADA495194).

In response to rapidly evolving mission requirements and changing tactics, techniques, and procedures (TTP), U.S. Army small unit leaders (company level officers and noncommissioned officers [NCOs]) are required to develop new training methods and/or adapt existing products to meet training needs. The core challenge for the small unit leaders is to develop and implement pre-deployment training to incorporate lessons learned experiences and TTP. At the same time the leaders must develop training for newly inserted capabilities and technologies. To identify training requirements and tools available for training development, the U.S. Army Research Institute for the Behavioral and Social Sciences gathered information through semi-structured interviews and surveys with both Active Component and Reserve Component leaders. Survey results were used to compare the needs of Active Component and Reserve Component units. Results identify language training, cultural skills training, and human terrain mapping as high priority areas where follow-on training development research would support Army needs.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA495194>

RR 1892

Instructor Facilitated Versus Stand Alone Tactical Game Training. (2009). Beal, S.A. (DTIC No. ADA494812).

Sixty-nine Infantry small unit leaders attending the Basic Noncommissioned Officer Course (BNCOC) at Fort Benning, Georgia, participated in an experiment that investigated the impact of instructor-facilitated versus stand-alone game training on tactical decision making. Thirty-two leaders were assigned to complete two urban operations-based missions (patrol and defense) using the SimFX game. These leaders worked under the direction of an instructor and interacted with peers. Thirty-seven more leaders completed the two missions, but worked in the absence of an instructor and peer interaction. Pre-exercise measures included military and game experience and tactical situation judgment. A questionnaire administered to leaders following the exercise documented their perceptions of training value, opportunities to implement tactical decisions, and motivation. Leaders in both groups were assessed individually for their ability to recognize and implement sound tactical decisions while serving as leader of a light Infantry squad during patrol and defense missions in a simulated urban environment. Results showed that tactical decision making performance was not impacted by training methods, but that leaders' perceptions of training value and decision making were more favorable when the exercise was facilitated by an instructor and when they interacted with peers. A discussion of the results and their applicability to the Army's trend towards distributed methods of instruction is included.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA494812>

RR 1893

Training Digital Skills in Distributed Classroom Environments: A Blended Learning Approach.

(2009). Tucker, J.S., McGilvray, D.H., Leibrecht, B.C., Strauss, C.P., Perrault, A.M., & Gesselman, A.N. (DTIC No. ADA495731).

Specific goals of the present research were to 1) report lessons learned from instructors in a distributed blended learning environment; 2) report student reactions to this type of learning environment; and 3) compare the training approaches with those reported for traditional classroom environments. Both the dL instructors and students acknowledged substantial value in the blended approach (video teletraining with computer software) for training digital skills remotely. The students offered some good suggestions for improving the training in distributed environments such as having hands-on training with tactical equipment and additional training aids (acronym list, commander's guide, train-the-trainer materials, etc.). Overall, the findings indicate that the dL instructors were able to adapt to using the technology to teach FBCB2 operations, resulting in training that is very comparable to the traditional courses. The positive student comments and similar training approaches and topical coverage support these findings. Additionally, major advantages and disadvantages of the dL method of instruction are noted. Several specific recommendations for dL instructors were made in the areas of (a) leveraging student strengths, (b) emphasizing problem-centered instruction, and (c) leveraging training aids. The findings contribute to the Army's efforts to enhance blended learning solutions to meet critical training needs.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA495731>

RR 1894

LEADDATA: An Assessment Toolkit to Measure Small Unit Leader Cognitive Skills: Phase 2.

(2009). Chiara, J.J., Zaccaro, S.J., & Pang, Y. (DTIC No. ADB347634 / Restricted).

RR 1895

Drill Sergeant Candidate Transformation. (2009). Cobb, M.G., Muraca, S.T., Sluss, D.M., Rutti, R., & Ployhart, R.E. (DTIC No. ADA495798).

While Drill Sergeant Schools (DSSs) are charged with preparing Noncommissioned Officers (NCOs) for the role and responsibilities of Drill Sergeants (DS), few attempts have been made to systematically examine the impact this training actually has on its graduates. Rather, previous research has largely focused on manning alternatives such as determining if Sergeants should be readmitted to DS duty, potential interventions employing DS to reduce Initial Entry Training (IET) attrition, and various strategies that could be employed by DSs to train and reinforce various tasks emphasized during IET. As requested by the Commanding General (CG), Fort Jackson, the U. S. Army Research Institute for Behavioral and Social Sciences (ARI) empirically assessed the changes in NCO leadership style, confidence, commitment, and motivation that occur as a function of DS training. Its purpose is to provide leaders at Fort Jackson with information and recommendations upon which they can base decisions that will impact the DSS and subsequent training of DS candidates.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA495798>

RR 1896

Flexible Method for Developing Tactics, Techniques, and Procedures for Future Capabilities.

(2009). Topolski, R., Leibrecht, B.C., Kiser, R.D., Kirkley, J., & Crabb, B.T. (DTIC No. ADA501254).

The goal of the research described in this report was to create a flexible and iterative method for exploring, developing, and refining tactics, techniques, and procedures (TTP). The approach harnessed knowledge elicitation (KE) methodology and simulation-based vignettes to provide a flexible set of tools to structure and guide the TTP development process. The resulting TTP development support package was implemented with Soldiers to assess and improve the method. The effectiveness of the method was measured by participant ratings as well as the research team's ability to implement the process. Using the structured KE process to facilitate TTP development was productive across all simulation vignettes. A majority of participants and researchers rated all aspects of the KE method highly, but identified shortcomings in the technical aspects of the simulation system used. Lessons learned and future recommendations are provided, including simulation requirements and improvements.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA501254>

RR 1897 — Cancelled

RR 1898

Mental Models for Effective Training: Comparing Expert and Novice Maintainers' Mental Models. (2009). Hubal, R.C. (DTIC No. ADA499530).

For a well-defined domain of knowledge, the process of learning can be characterized as a student's construction of a mental model of the domain's elements and their inter-relationships. It follows that a student's mental model can be compared against a desired mental model (such as an expert's) before, during, and at the conclusion of instruction. Differences between mental models could be useful for student diagnosis and assessment and for curriculum modification. In this investigation mental models of test, measurement, and diagnostic equipment (TMDE) usage for novice, intermediate, and expert U.S. Army ordnance electronics maintenance personnel were characterized and compared. Comparisons revealed differences between non-experts and experts, and also differences among experts.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA499530>

RR 1899

Assessment Tools for Basic Army Noncommissioned Officer Training. (2009). Sidman, J., Riccio, G.E., Semmens, R.P., Geyer, A., Dean, C., & Diedrich, F.J. (DTIC No. ADA499492).

The Army Research Institute Ft. Benning Research Unit and the Henry Caro Noncommissioned Officer Academy at Ft. Benning identified the need to create an objective assessment scheme for the Infantry Basic Noncommissioned Officer Course (BNCOC). The intent was to produce an assessment instrument that could be used for formative and summative assessment both of different versions of BNCOC and also of different research interventions into BNCOC. Assessment instruments were developed for two major training modules: small arms proficiency training (SAPT) and troop leading procedures (TLP). During development of the assessment instruments, the Infantry BNCOC pedagogical model changed from direct, instructor-led training to outcome-based training and education (OBTE) and a corresponding emphasis on intangibles. With the change to OBTE, the SAPT and TLP instruments are now being used by BNCOC cadre as instructional job aids. Lessons learned from both instruments were incorporated into an outline for OBTE instructor preparation. Additionally, both instruments will serve as foundation for follow-on development of assessments of the effect of research interventions associated with OBTE upon BNCOC students.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA499492>

RR 1900

Self-Assessment: Review and Implications for Training. (2009). Breidert, J.T., & Fite, J.E. (DTIC No. ADA501346).

Across the spectrum of self-assessment research, a topic of debate concerns the accuracy by which individuals can evaluate their own performance. While some research has found self-assessment to be an effective measure, the majority typically found it to be an under- or over-estimation of actual performance. Although the accuracy of self-assessment has seen skepticism, benefits have been well documented. The current review is the result of examination concerning self-assessment accuracy and utility. The literature was searched to evaluate the ability of trainees/job incumbents/students to accurately report their level of ability or performance. Upon examination of the self-assessment accuracy literature, problems arose concerning terminology and differential utilization of self-assessment. This review reports that self-assessment, as currently used, is generally inaccurate; but given appropriate consideration of the moderating variables and clarification of terminology, self-

assessment accuracy could increase. The Army should utilize a continuum of self-assessment, considering domain and skill level as determinant factors. Self-grading could be useful for the introduction and training of new skills. Self-impression may be useful for assessing Soldiers' confidence, self-perception of personality or traits, and continuous performance appraisal. Implementation of the continuum has potential to improve training quality and skill retention throughout the Army.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA501346>

RR 1901

Assessment of the Warrant Officer Technical and Tactical Certification Course. (2009). Beal, S.A., Kilcullen, R.N., Lussier, J.W., Martin, D., & Ferro, G.A. (DTIC No. ADA508025).

In response to a request from the U.S. Army John F. Kennedy Special Warfare Center and School, U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) initiated a research effort to assess the effectiveness of the new Warrant Officer Technical and Tactical Certification Course (WOTTC) in terms of producing Special Forces (SF) Warrant Officers (WO) who could perform effectively on the job. A behaviorally anchored rating scale (BARS) was developed to assist the assessment process. Seventeen SF battalion commanders and 13 senior WOs provided individual job performance ratings for 91 WOTTC graduates, in addition to rating their performance as a group relative to other SF WOs of the same rank and experience. In general, the ratings for junior WOs suggest that the WOTTC produces graduates who perform capably on the job. Written comments provided by leaders reinforced the positive assessment of the WOTTC graduates' job performance. This report describes the methods used to complete the effort, documents the results, and discusses how the findings reflect the utility of the WOTTC for SF WOs.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA508025>

RR 1902

Initial Research on Multitask Training and Transfer: Research Issues for the Future Force. (2009). Schaefer, P.S., & Crabb, B.T. (DTIC No. ADA503357).

New technologies currently under development will provide Soldiers with unprecedented amounts of information. However, these technologies will also require Soldiers to multitask (MT) under demanding circumstances. In two experiments, Soldiers were trained to complete single tasks (ST) or to MT. Their ability to multitask trained and novel tasks was then measured. Results indicate that although performance during training is superior for the ST trained participants, this pattern reverses when participants are required to MT both trained and novel tasks. Further, MT training performance is a better predictor of MT performance on both trained and novel tasks than ST training performance. Finally, working memory appears to be a relevant predictor only for individuals who have not received MT training. Future research issues should include an examination of task characteristics which may impact the transfer of multitasking skills. Implications for multitask training and personnel selection are discussed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA503357>

RR 1903

Decision Making with Digital Systems. (2009). Goodwin, G.A. & James, D.R. (DTIC No. ADA507441).

Access to current, accurate battlefield information via the Army Battle Command System (ABCS), is supposed to improve decision making by leaders and commanders, but some research suggests that information systems may, paradoxically, have the opposite effect by overwhelming leaders with information or by emphasizing irrelevant information. There are currently no published reports examining the impact of ABCS systems on decision-making. This report is an effort to address this important research gap through an investigation of the ways the ABCS impacts decision-making by Army leaders at the Joint Readiness Training Center (JRTC). Observer/controllers (O/Cs) at JRTC reported that few units are fully trained to use their ABCS systems. Nevertheless, most units were able to leverage some system capabilities to accomplish mission objectives. The most common decision errors were the result of the availability heuristic (e.g., making a decision with incomplete information). Of the six decision errors examined, only two were reported to involve ABCS systems. O/Cs also indicated that when digital systems increased errors, it was due to improper use rather than the design of the system. Thus, the data suggest that these systems do not increase decision errors; however, their potential to reduce errors has not yet been fully realized by units training at JRTC.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507441>

RR 1904

Training Analyses Supporting the Land Warrior and Ground Soldier Systems. (2009). Dyer, J.L., & Tucker, J.S. (DTIC No. ADA507444).

This report documents two training analyses conducted in 2005 through 2007 on the Land Warrior (LW) and Ground Soldier System (GSS), respectively, as part of Analysis of Alternatives efforts on these systems, which supported milestone decisions for each system. One analysis assessed the sufficiency of the LW New Equipment Training conducted for a Stryker Battalion. The other examined the institutional impact of equipping seven Stryker Brigade Combat Teams with the GSS. The assessment and research techniques used in the training analyses have general applicability to estimation of training requirements and resources for other developing systems. The report also provides an audit-trail of individual tasks associated with dismounted ground Soldier systems.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507444>

RR 1905

The Development of Planning and Measurement Tools for Casualty Evacuation Operations at the Joint Readiness Training Center. (2009). Evans, K.L., Coerper, M.F., & Johnson, J.A. (DTIC No. ADA507442).

The present investigation sought to quantify small unit casualty evacuation (CASEVAC) practices at the Joint Readiness Training Center (JRTC) and to determine the extent to which a job performance aid, the Warrior Leaders Casualty Evacuation Guide, might improve unit CASEVAC performance. Unit CASEVAC practices were measured by trainers/mentors using the Casualty Evacuation Checklist, a tool developed especially for the investigation. Over the course of ten unit rotations at JRTC, 768 checklists were collected and analyzed. The Warrior Leaders Casualty Evacuation Guide was found to positively influence unit performance in the areas of CASEVAC planning and execution. Unit strengths and weaknesses in CASEVAC operations were identified. Overall, units that rehearsed their CASEVAC plans were significantly less likely to have their CASEVAC operations interrupt mission accomplishment than units that did not rehearse their plans. This finding was consistent with previous research on troop leading procedures and unit information management practices at JRTC.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507442>

RR 1906

Determining a Critical Skill Hierarchy for Command Post of the Future. (2009). Catrambone, R., Wampler, R.L., & Bink, M.L. (DTIC No. ADA507712).

The Command Post of the Future (CPOF) is a dynamic visualization tool that supports collaborative decision-making in tactical units. The system uses a customizable workspace based on the user's needs rather than a static format. While such an approach to digital-systems design offers flexibility and generality of use, it might also increase the complexity of learning to use the interface. As a precursor to examining alternative training approaches for CPOF, this report documents an analysis of and hierarchical structure for underlying CPOF skills. A knowledge extraction process was conducted with CPOF domain experts (DEs) to uncover the knowledge needed to use CPOF. The DEs performed a series of tasks based on the practical exercises developed for training Soldiers. A Critical Skills Document was iteratively updated and reorganized in order to identify the major components of the system and the procedures for accomplishing various tasks. The Critical Skills Document represents CPOF skills in a way to show their generality and applicability. Instructional designers can use it to determine what to train as well as a guide for developing learning assessments. The findings provide a foundation for comparing training approaches for CPOF and similar digital systems.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507712>

RR 1907

Developing an Onboarding Program to Improve Senior Leader Transitions in the Army. (2009). Foster-Thompson, L., & Beal, S.A. (DTIC No. ADA507481).

The U.S. Army has long had an institutionalized form of personnel rotation among its leaders. As such, a large amount of senior leadership time is spent learning unfamiliar organizational culture, adjusting to new roles, and developing new critical networks of relationships needed to command effectively. Presently, much of this happens in a relatively non-systematic fashion, sometimes resulting in inefficiencies and preventable mistakes. The purpose of this paper is to discuss the difficulties that accompany senior leadership transitions and propose onboarding as a solution to help military leaders and organizations deal with these challenges. Drawing from best practices developed in the civilian

sector, this paper describes a hypothetical Army onboarding program in order to illustrate the concepts and principles associated with it. It includes recommendations for tailoring a senior leader onboarding program to the particular requirements of an individual command. Although a number of the issues presented in this paper likely apply to many military settings, they are discussed and illustrated here in the context of U.S. Army leaders who are responsible for overseeing support staff in an office-type (e.g., headquarters) environment.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507481>

RR 1908

END STATE: Commander's Visualization at the Company Level. (2009). Lickteig, C.W., Schaefer, P.S., Fite, J.E., Hendrix, T., Puchino, S., Harrison, J., & Cianciolo, A.T. (DTIC No. ADM002296 / DVD).

Visualization is the process of developing situational understanding and envisioning how to move the force from its current state to the desired end state. It is a critical command skill that must be acquired earlier in a leader's career than ever before given today's challenging operational environment. Training is needed that provides deliberate reflection and practice opportunities to improve visualization. To meet the requirement, U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) conducted research on developing training that improves company and battalion commanders' visualization. This report describes the design, development, and formative evaluation of END STATE – Commander's Visualization at the Company Level which provides instructorless, interactive training and testing to help company commanders and their units visualize the operational environment. Forty-eight captains and lieutenants participated in a formative evaluation that concluded END STATE is effective, relevant, and worth using. Revisions based on participant recommendations resulted in an END STATE product ready for pilot implementation. Ongoing ARI research on END STATE will develop parallel pre- and post-tests to assess training effectiveness and normative standards of novice, intermediate, and expert performance. Research and implementation will establish an empirical base to understand and improve the ability of company commanders and their units to visualize operations in today's operational environment.

RR 1909

Innovative Methods to Acquire and Adapt Soldier Skills in the Operational Environment. (2009). Phillips, J., Ross, W.A., Lickteig, C.W., & Livingston, J.D. (DTIC No. ADA510819).

This report documents an effort initiated by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to 1) specify a set of high-priority competencies required in counter-insurgency (COIN) missions, and 2) identify innovative training methodologies to help Soldiers acquire cognitive competencies for COIN. The analysis focused only on high-priority cognitive competencies. Following the analysis of COIN cognitive competencies, faculty from the Consortium Research Fellows Program (CRFP) identified innovative approaches to train performance of the competencies and their corresponding knowledge, skills, abilities, and attitudes (KSAs). The CRFP consultants documented their recommended approaches in white papers that also examined requirements for development and implementation. The research team then considered the applicability of the training approaches to the identified COIN cognitive competencies and the feasibility of each approach for incorporation into the U.S. Army's training system in order to prioritize the training methodologies accordingly. As a result, recommendations were made on further development of the training approaches and multimedia demonstrations of the three most promising approaches were created and included in this report to promote future training development efforts.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA510819>

RR 1910

Assessment of a User Guide for One Semi-Automated Forces Version 2.0. (2009). James, D.R., & Dyer, J.L. (DTIC No. ADA510823).

A User Guide was developed for One Semi-Automated Forces (OneSAF) version 2. It was designed to assist Army Research Institute (ARI) researchers and other first-time users who desire to use this simulation capability in their research or training application. The User Guide contains detailed, illustrated steps of the core procedures required to develop a basic scenario at the platoon and company echelons, thus serving as a prototype for guides that support future versions of OneSAF. Subject matter experts from the Maneuver Battle Lab at Ft. Benning, GA reviewed the User Guide and completed an assessment of it. Additions were made to the User Guide to address their recommendations. The revised User Guide is included as an Appendix to the report.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA510823>

RR 1911

Peer-To-Peer Training Facilitator's Guide: Development and Evaluation. (2009). Costanza, M.N., Leibrecht, B.C., Cooper, W., & Sanders, W.R. (DTIC No. ADA508309).

The peer-to-peer (P2P) training approach involves small groups of people from similar social groupings, who are not professional teachers, helping each other to learn. The P2P approach has great potential for rapidly identifying emerging lessons learned and integrating them into wide-reaching Army training. The present research identified the instructional principles and best practices for P2P from academia, industry, and the military supporting effective P2P training and incorporated them into a Soldier-friendly facilitator's guide. A formative evaluation was conducted with Soldiers using the guide to prepare and conduct group discussions for a face-to-face group setting and a distributed group setting where Soldiers were linked via video teleconference. One group of Soldiers served as "facilitators" and used the facilitator's guide to prepare and lead discussions with other Soldiers who served as "learners." Feedback on the guide was mostly positive with Soldiers indicating that the guide provided an appropriate amount of information and a usable format and tools for structuring and fostering group discussions. Ongoing efforts to transition P2P methods into Army training are discussed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA508309>

RR 1912

Initial Evaluation of a U.S. Army Training Need: Soldier Skills to Develop, Enhance, and Support Local Level Host Nation Governance. (2009). Fite, J.E., Breidert, J.T., & Shadrack, S.B. (DTIC No. ADA507921).

During recent interviews with U.S. Army commanders, researchers from the U.S. Army Research Institute for the Behavioral and Social Sciences learned of a critical requirement for training to support missions aimed at developing and supporting legitimate host-nation governance (HNG). Unfortunately, such training is not currently available. Therefore, the primary purposes of this report were to document the Army's need for governance-related training and provide a tool to aid upcoming efforts to address that need. Through interviews with Soldiers and leaders, we confirmed the training needs initially communicated to us, and learned of the governance activities of Soldiers at squad, platoon, company, and battalion levels. Through a review of recent Army Field Manuals 3-24, 3-07, and 3-24.2, we demonstrated that doctrine has provided an extensive framework upon which governance training can be developed. Through a review of academic and non-governmental literature, we identified commonly used indicators of governance and made note of important considerations for their use. We conclude our report with a preliminary research plan with which we will pursue the development of training that will prepare Soldiers to develop, enhance, and support local level HNG.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507921>

RR 1913

Science of Human Measures Workshop: Summary and Conclusions. (2009). Goodwin, G.A., Tucker, J.S. Dyer, J.L., & Randolph, J. (DTIC No. ADA507935).

The U.S. Army Research Institute for the Behavioral and Social Sciences hosted a workshop on human measurement. The workshop consisted of four panels that discussed assessment of attitudes and aptitudes, mental agility, individual performance, and new training programs. The workshop began with a plenary session with keynote addresses. Each panel was led by a retired general officer and a leading academic or industry researcher. With regard to measuring attitudes and aptitudes, key topics discussed included developing better ways to identify highly qualified individuals from among those who would otherwise be ineligible for service and developing better measures of Soldier and Family well-being. To develop mental agility measurements, panelists suggested building a model based on critical incidents of operational experience, developing measures to assess the critical skills identified in the model, and linking the measures to performance. Regarding the measurement of individual performance, panelists discussed re-scoping initial entry training to train and measure attributes like teamwork, initiative, and accountability in addition to basic combat skills and tasks. Finally, with regard to assessing new training programs, panelists discussed the many challenges in conducting quality assessments of new institutional courses, new equipment training, and unit training. At the end of the workshop, the co-leaders briefed the conclusions of their panels to an invited audience of Army leaders.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507935>

RR 1914

Company Intelligence Support Teams: An assessment of Manning, Training, and Performance. (2009). Sanders, W.R. (DTIC No. ADB354249 / Restricted).

RR 1915

Exploring the Use of a Multiplayer Game to Execute Light Infantry Company Missions. (2009). Beal, S.A., Wright, K., & Topaz, D. (DTIC No. ADA509331).

Leaders and instructors in the Maneuver Captains Career Course (MCCC) at Fort Benning, Georgia, have had limited success using training games. Early efforts to provide the MCCC with training games resulted in mission scenarios that were broad in scope, but lacked depth and realistic functional effects, particularly those exhibited by computer-generated forces. In order to elevate the level of functional fidelity and meet training objectives, MCCC instructors explored the use of DARWARS Ambush, a multiplayer game that eliminated computer-generated forces, provided appropriate assets, and allowed MCCC Soldiers to control leader and subordinate entities during simulated Infantry company-level missions. This paper documents an exploratory evaluation of a multiplayer game to provide the MCCC with effective company-level simulated mission execution experiences. Forty Soldiers executed two missions during which each human entity on the simulated battlefield was controlled by a human Soldier. Researchers measured the extent to which the game provided control over assets, appropriate tactical capabilities, and the opportunity for Company Commanders to make and implement tactical decisions as conditions and events emerged. The Soldiers expressed their perceptions of the training value and effectiveness of the multiplayer game by completing a questionnaire. Results suggested that multiplayer games have some training potential, but that desired performance outcomes can only be realized when specific environmental and training conditions are met.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA509331>

RR 1916

Asymmetric Attention: Visualizing the Uncertain Threat. (2010). Vowels, C.L. (DTIC No. ADA516567).

This report attempts to fuse Army needs, specific to threat detection, with available evidence from academia and military sources. The report provides viable routes for short-term enhancement of threat detection training and long-term goals of a research program dedicated to improving the Army's understanding of threat detection. This review found two major avenues of research, visual attention and visual memory that would benefit research and understanding of attention and threat detection for current and future operational environments. Based on the review, at least three sequential skills are discussed as necessary for understanding and improving threat detection: attentiveness, recognition, and action. These skills orient and guide the Soldier in operational settings from the basic perceptual process at the attentiveness stage up through higher-order reasoning at the action stage. Training formats are explored including still images and high-fidelity simulations, all of which could be scaffolded upon a deliberate practice framework.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA516567>

RR 1917

Assessing Judgment Proficiency in Army Personnel. (2010). Foldes, H., Ferro, G.A., Vasilopoulos, N.L., Cullen, M.J., Wisecarver, M.M., & Beal, S.A. (DTIC No. ADA514851).

Because of the unpredictable nature of the Army's current conflicts, operational requirements demand that Soldiers and leaders become proficient in military judgment and decision-making. This research presents an analysis of military judgment proficiency (MJP), which is judgment and decision-making in environments characterized by cultural, legal/ethical, and tactical complexity. We reviewed relevant literature in the areas of judgment, decision-making, and problem-solving to present a sound theoretical foundation for the MJP construct. We defined MJP as a complex skill and argued that in ambiguous, novel, rapidly changing situations in which there is limited time, information, and resources, Soldiers demonstrating MJP are more likely to select an effective course of action by appropriately identifying the nature of the situation, recognizing relevant situational factors, and forecasting the best overall outcome(s), given the situation. We describe also the initial stages of development of an assessment tool that will distinguish among Soldiers on MJP, and lay out future plans for test validation with Special Forces and non-Special Forces Soldiers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA514851>

RR 1918

Sustainment of Individual and Collective Future Combat Skills: Modeling and Research Methods. (2010). Cianciolo, A.T., Crabb, B.T., Schaefer, P.S., Jackson, S., & Grover, J. (DTIC No. ADA514991).

Army commanders have insufficient time to train on every mission requirement and organizational standard. Mission essential task lists help to scope training requirements based on current performance. However, there presently is no way for unit trainers to systematically schedule their training based on expected performance. The ability to project training status outward, beyond current performance levels, would enhance decisions about scheduling training. The ARI has previously investigated skill retention in order to develop such a capability. Changes in the operational environment and in the theoretical understanding of human performance have created opportunities to advance ARI's research program and have necessitated that these advances be made to assist the warfighter. Our research assessed the implications of the contemporary operational environment for maintaining skilled performance in light of a host of theoretical factors thought to influence skill decay. We implemented our findings in a survey-based instrument to be used for rating individual and collective tasks on several of these retention factors. This paper describes the survey-based instrument, its development, and initial evaluation. In future work, task ratings assigned using this instrument will be compared to actual performance data in order to build and validate a quantitative model of individual and collective skill retention.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA514991>

RR 1919

Soldiers' Toolbox for Developing Tactics, Techniques, and Procedures. (2010). Topolski, R., Leibrecht, B.C., Porter, T., Green, C., Haverty, R.B., & Crabb, B.T. (DTIC No. ADA517635).

This document describes research conducted to create an innovative, Soldier-friendly method for developing tactics, techniques, and procedures (TTP). The approach built on previously developed methodology, blending knowledge elicitation techniques and simulation-based vignettes to produce a flexible set of tools to structure and guide the TTP development process. The resulting toolbox was implemented with Soldiers to obtain feedback and ideas for improving the method. When groups of Soldiers used the toolbox to develop focused TTP, the method proved to work well with a variety of missions and tactical conditions. The clarity and quality of the tools as well as the effectiveness of the method were assessed using multiple measures. The Soldiers rated the effectiveness of the method's various components positively. The quality of the resulting TTP increased across exercises (practice effect) and groups (resulting from toolbox improvements between groups). Lessons learned about various aspects of the methodology are included.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA517635>

RR 1920

Applying Combat Application Course Techniques to Rifle Marksmanship in Basic Combat Training: Acquisition and Retention of Skills. (2010). Cobb, M.G., Graves, T.R., James, D.R., Dlubac, M.D., & Wampler, R.L. (DTIC No. ADA516970).

This research provided an initial assessment of the impact on performance outcomes of providing additional time for Basic Rifle marksmanship (BRM) training in Basic Combat Training (BCT) and of integrating Asymmetric Warfare Group (AWG) and Combat Application Training Course (CAT-C) training techniques within two BCT Companies. The report provides a snapshot of how Soldiers retained marksmanship skills in association with the integration of AWG training techniques in BRM and the addition of one week to the BCT schedule. Results indicated that the new training techniques and additional training time did not significantly impact performance outcomes or BRM skill retention when compared to BRM performance of Soldiers trained using legacy techniques and less training time during BCT. Although sample and methodological considerations limit the generalizability of this research, it provides some essential insights into the initial integration of CAT-C/AWG training strategies and techniques within BCT at Fort Jackson.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA516970>

RR 1921

Army Institutional Training: Current Status and Future Research. (2010). Bickley, W.R., Pleban, R.J., Diedrich, F.J., Sidman, J., Semmens, R.P., & Geyer, A. (DTIC No. ADA516971).

This document provides a listing of findings and issues resulting from an overview of current Army institutional training and, from the perspective and constraints of Army training, an overview of current learning theory and science. Findings and issues are categorized as "policy issues" and "research

issues". Policy issues, such as training scheduling and availability or quality of training technology, are presented as items with relatively straightforward, direct potential solutions that can be analyzed and considered for adoption by Army institutional training management. Research issues, such as modifying training to address far transfer or integrating problem-centered instructional approaches into Army training, are presented as items with no direct solutions and that are suitable for further investigation, ranging from basic research in training and education to development and assessment of prototype Army training and education products.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA516971>

RR 1922

Evaluating a Job Aid for Tactical Site Exploitation at the Joint Readiness Training Center. (2010). Evans, K.L., Snyder, J.A., & Carmicle, F. (DTIC No. ADA518694).

The present investigation sought to quantify small unit tactical site exploitation (TSE) practices at the Joint Readiness Training Center (JRTC) and to determine the extent to which an existing job performance aid, the TSE Smart Card, might improve unit TSE performance. Unit TSE practices were measured by trainers/mentors using the TSE Checklist, a tool developed especially for the investigation. Over the course of nine unit rotations at JRTC, 518 checklists were collected and analyzed. The TSE Smart Card was found to positively influence unit performance in the areas of TSE background, planning, execution, and follow-up. Unit strengths and weaknesses in TSE operations were identified. Overall, units that rehearsed their TSE plans were significantly more likely to take advantage of TSE opportunities, to conduct TSE operations in a timely manner, and to orchestrate TSE in accordance with the combat situation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA518694>

RR 1923

Assessing Soldier Individual Differences to Enable Tailored Training. (2010). Schaefer, P.S., Bencaz, N., Bush, M.D., & Price, D.M. (DTIC No. ADA519594).

Tailoring training can improve training effectiveness and efficiency. However, before informed decisions can be made about tailoring training in U.S. Army institutional settings, decision makers must know which individual differences are relevant to learning in those settings. To that end, instructors at the Ft. Rucker, AL Warrant Officer Candidate School (WOCS) were interviewed to determine which individual differences predict Soldier academic performance. Other individual differences were selected by the research team on the basis of hypothesized relationships between experiences and course demands. Instruments created to measure those individual differences were reviewed and approved by the WOCS instructors. The instruments were then administered to two classes (more experienced vs. less experienced military persons, total N = 157) of WOCS students. The ability of the instruments to predict academic performance was then assessed. Which IDs predicted academic performance varied with class type. Implications for future tailored training research are discussed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA519594>

RR 1924

Soldier Performance on a New Marksmanship Course of Fire. (2010). Dyer, J.L., Schaefer, P.S., Bink, M.L., James, D.R., Wampler, R.L., & Dlubac, M.D. (DTIC No. ADA523973).

The research investigated a new course of fire, called combat field fire (CFF), to determine CFF marksmanship standards, and where CFF should occur in marksmanship training. CFF is a complex scenario requiring changing magazines, reacting to a simulated malfunction and engaging targets within arrays that require multiple hits. Ten training companies (1976 Soldiers) from the Infantry OSUT and Basic Combat Training Brigades at Ft. Benning, GA participated. Six companies executed Army qualification at the end of basic rifle marksmanship (BRM) and CFF at the end of advanced rifle marksmanship (ARM). Four executed CFF in BRM and executed Army qualification in ARM. Performance data and Soldier interviews revealed the unique dynamics of CFF, differentiating it from Army qualification. Results showed that CFF should be in ARM, as Soldiers were not prepared in BRM for the additional skills and demands required by CFF. Recommended standards were developed for the Expert, Sharpshooter, Marksman, and Unqualified marksmanship categories, TPU (trained, needs practice, and not trained) categories, and Go/NoGo categories.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA523973>

RR 1925

Full Spectrum Training and Development: Soldier Skills and Attributes. (2010). Cooper, W., Leibrecht, B.C., Anderson, H., Topolski, R., Reeves, R., & Lickteig, C.W. (DTIC No. ADA524491).

Counterinsurgency (COIN) is essentially a human endeavor that taxes the full spectrum of human capabilities. The challenges of COIN and Full Spectrum Operations (FSO) require a complementary approach to Soldier preparation referred to here as Full Spectrum Training and Development (FSTD). The goal of the research described in this report was to develop an exemplary guide for FSTD focused on the skills and attributes needed for reconnaissance leaders in FSO. This goal was achieved by developing and evaluating a guide designed to help instructors facilitate collaborative learning. The guide incorporated principles and best practices of peer-to-peer training to directly support instructors teaching reconnaissance leader skills and attributes. During development the guide underwent iterative review by course leaders and instructors as well as behavioral research scientists. The guide was then evaluated and revised based on two operational implementations. Empirical data from the evaluations suggested the guide is a valuable and welcome resource for instructors and course leaders. The report includes suggestions for extending the methodology to other U.S. Army courses.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA524491>

RR 1926

Prototype Procedures to Describe Army Jobs. (2010). Ingerick, M., Oliver, J., Allen, M.T., Knapp, D.J., Hoffman, R.R.III, Greenston, P.M., & Owens, K.S. (DTIC No. ADA523957).

Descriptions of Army jobs or Military Occupational Specialties (MOS) provide the foundation for Army personnel management, from entry-level selection and classification to training and performance management. However, existing job analysis approaches used in the Army have a number of limitations. This project represents the first step in a long-term research roadmap intended to address this issue (Campbell et al., 2007). The purpose of this project was to develop and field test a new prototype job analysis approach, customized to the Army, for describing entry-level enlisted jobs. Questionnaires measuring work and worker-oriented domains were developed and administered online to incumbents and supervisors in six MOS (N = 1,390): (a) Infantryman (11B), (b) Armor Crewman (19K), (c) Signal Support Specialist (25U), (d) Light-Wheel Vehicle Mechanic (63B), (e) Military Police (31B), and (f) Motor Transport Operator (88M). The results of the field test demonstrated that the questionnaires evidenced sufficient reliability and validity for describing enlisted jobs and feature a method that could be easily expanded Army-wide and at a reasonable cost. The report concludes with a summary of lessons learned from the field test and discussion of ways in which future research can enhance and extend the prototype approach.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA523957>

RR 1927

The Roles of Perseverance, Cognitive Ability, and Physical Fitness in U.S. Army Special Forces Assessment and Selection. (2010). Beal, S.A. (DTIC No. ADA525579).

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) conducted research for more than a decade in support of U.S. Army Special Operations Forces (ARSO) assessment, selection, and training. This research was completed prior to the events of September 11, 2001. Leaders at the John F. Kennedy Special Warfare Center and School (SWCS) at Fort Bragg, NC, requested that ARI begin updating research in support of Special Forces. This report documents a new effort to understand better the roles of cognitive ability, physical fitness, and performance events in the Special Forces Assessment and Selection (SFAS) process. In addition, researchers identified a measure of perseverance, viewed as an individual Soldier characteristic, to include in the investigation at the SWCS's request. The 824 Candidates who participated in this research completed a series of cognitive ability tests, physical fitness measures, SFAS performance events, and the test of perseverance. The results showed that almost all the tests and measures included in the analyses contributed to valid predictions of Soldier success with SFAS, but that their individual strengths of prediction varied. The SFAS performance events provided the greatest predictive strength, followed by the cognitive ability and physical fitness tests. While perseverance provided a unique contribution, its role was incremental, at best, and should not be used as a criterion for selection decisions in isolation from the other measures. Taken together, the tests and measures form an empirically-sound foundation upon which SFAS decisions can be based. Once obtained and analyzed, the outcome data from the Special Forces Qualification Course (SFQC) and subsequent training will provide a more complete view.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA525579>

RR 1928

END STATE: Commander's Visualization at the Company Level: Training Refinement and Transition. (2010). Lickteig, C.W., Stroupe, H., Menaker, E.S., Hendrix, T., Myers, D., Silverman, M., & Cianciolo, A.T. (DTIC No. ADA527556).

Visualization is a critical command skill that must be acquired earlier in a leader's career than ever before. Training is needed that will improve commander's visualization through deliberate reflection and practice, coupled with performance assessment and expert feedback and guidance. To meet this requirement, the U.S. Army Research Institute for the Behavioral and Social Sciences researched and developed a training product called END STATE – Commander's Visualization at the Company Level. This report documents follow-on research conducted to refine and transition the END STATE training product to the U.S. Army's junior leaders. During prior formative evaluations, 48 captains, lieutenants, and senior noncommissioned officers (NCO) concluded that the END STATE training product is relevant, effective, and worth using. Given the additional refinements and results of the present research, the authors conclude that END STATE is a relevant learning tool that will help junior officers and NCOs develop the visualization skills needed to understand and adapt to the challenges of today's counterinsurgency environments.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA527556>

RR 1929

Web-Enabled Exercise Generation Tool for Battle Command Training. (2010). Palla, A.L., Cianciolo, A.T., Craig, A., Wadsworth, A., Chang, K., Yuan, P., & Shadrick, S.B. (DTIC No. ADA527862).

U.S. Army trainers are required to deliver effective training in less time than ever before. Therefore, research and development to support Soldier training must explore advanced learning environments, instructional strategies, and training-development processes to enable the rapid generation of training activities that are responsive to immediate training needs. The purpose of the present Phase II Small Business Technology Transfer (STTR) effort was to research and develop an integrated platform of technologies, the U.S. Army Training Assistant (TA), to enable "one stop" creation, delivery, and management of web-enabled multimedia training exercises. The Phase II work detailed in this report consisted of behavioral research, development of a working TA prototype, and usability testing of the prototype. Results indicated that test participants generally found the TA to be easy to use, with the majority reporting that they could and would use it. If developed, the Phase III product would address four main areas of enhancement identified during user testing to create a tool that will allow unit trainers to create accurate, engaging training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA527862>

RR 1930

Methods and Measures for Communicating Tactics, Techniques, and Procedures. (2010). Anderson, H., Topolski, R., Leibrecht, B.C., Green, C., Crabb, B.T., & Lickteig, C.W. (DTIC No. ADA530341).

This report describes the methods developed and experiments executed to explore the best methods for communicating tactics, techniques, and procedures (TTPs) and measuring Soldiers' understanding of TTPs. It contains sample documentation of the communication methods, measures, training, and vignettes developed for this exploratory research and then packaged in a "TTP Toolbox" for Soldiers. Overall, each of the three modes of communication resulted in superior performance relative to the control condition, indicating the communication methods tested actually increased Soldiers' understanding of TTP. The Written mode of communication appeared to provide greater understanding of TTP; however, Soldiers preferred the Video-Graphic-Written mode. The authors examine alternate explanations for the findings and document lessons learned about TTP communication and measurement methods based on Soldiers' feedback. The report concludes with method recommendations to improve TTP communication and understanding for future research and implementation. A companion Research Product more fully documents the TTP methods in hard copy and electronic format to facilitate the transition of the TTP Toolbox to Army units and organizations.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA530341>

RR 1931

Evaluation of a Game Based Simulation During Distributed Exercises. (2010). Singer, M.J., & Knerr, B.W. (DTIC No. ADA531579).

Two exercises using a Game-Based Simulation (GBS) were conducted by the U.S. Army Research Development and Engineering Command, Simulation and Training Technology Center (RDECOM-STTC) and the United Kingdom Land Warfare Development Group. Soldiers from the U.S. Army and the U.K. military conducted coalition mission rehearsals during each exercise. Data were collected on the system user interface, on the effectiveness of unit and joint exercise sessions, and on After Action Review (AAR) functionality and applications. Several issues in technological capabilities limited and constrained the military tasks that could be performed during the exercises, and limited the AARs. Nevertheless, questionnaire data collected during each exercise indicated several positive aspects of using game-based simulations. The GBS system was considered capable of providing considerable scope for general dismounted Soldier rehearsal and training. The graphics and user interface were judged adequate for use in training rehearsals and AARs, especially in preparation for home station field training exercises. The largest negative issue was the limited number of weapon types and equipment. The second largest issue was the limited equipment functionality that the system supported. A third issue was the lack of sufficient numbers of civilians and opposing forces for different interactions in the non-kinetic exercises.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA531579>

RR 1932

Enhancing Perception in Ethical Decision Making: A Method to Address Ill-Defined Training Domains. (2010). Graves, T.R., Pleban, R.J., Miller, M.L., Branciforte, J.V., Donigian, A.M., Johnson, V., & Matthews, M.D. (DTIC No. ADA530670).

A mixed-method research approach was developed to address description, definition, and measurement in ill-defined training domains. A series of research efforts were conducted to demonstrate the approach and assess its viability. The ill-defined domain that served as the vehicle for this effort was the sense-making (perceptual and interpretive) process of the ethical decision making experience among United States Military Academy Cadets. Here, we empirically derived a thematic model of the ethical decision making experience based on a sample of written accounts. Using the thematic model, the Ethical Perceptions Scale (EPS) was developed to measure individual and group perceptual/interpretive preferences for ethical decision-making with respect to military specific ethical dilemmas. A confirmatory factor analysis supported that the Ethical Perception Scale is measuring in accord with the thematic model. We also tested the reliability and construct validity of the scale; reliability was good and construct validity indicated that the scale measures in the correct conceptual domain. The model and scale are applicable to Professional Military Ethics training for Officer Cadets and newly commissioned junior officers to cover ROTC, OCS, and USMA. The research method demonstrated may be applied to address other ill-defined domains in Army, and other, research and training contexts.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA530670>

RR 1933

Training Methods to Build Human Terrain Mapping Skills. (2010). Zimmerman, L.A., Sestokas, J.M., Bell, J.A., Manning, D.R., & Sanders, W.R. (DTIC No. ADA532276).

A key to success in counterinsurgency operations involves finding ways to identify the insurgents within the population. Success will likely require that Soldiers develop the cultural and information gathering skills necessary to develop a detailed knowledge of the "human terrain" in their area of operations. This report documents research conducted to develop Human Terrain Mapping (HTM) skills for Soldiers, where HTM is an overarching concept that refers to methods and tools used to systematically collect and catalog social and ethnographic information. Given the rapidly changing nature of current conflicts, the research effort sought to gather HTM training requirements and tactics, techniques, and procedures (TTP) from members of an intact unit that had worked together performing the HTM functions in a recent deployment. Sixteen Soldiers from a recently deployed brigade were interviewed to identify the TTP they used to accomplish HTM tasks. Based on the interview findings a training product was developed that demonstrates methods and tools for building an understanding of the HTM process, specific information elicitation techniques, and Soldier observation skills.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA532276>

RR 1934

Augmented Performance Environment for Enhancing Interagency Coordination in Stability, Security, Transition, and Reconstruction Operations: Phase 2. (2010). Cianciolo, A.T., & DeCostanza, A.H. (DTIC No. ADA535463).

Report development under a Small Business Innovative Research Program, Phase II. Phase I research explored the implications of organizational culture for planning interagency stability, security, transition, and reconstruction operations at the field level. Specifically, planning deficits were identified, their roots in organizational differences investigated, and a proof of concept training system prototype was developed. In Phase II, effort was devoted to refining the design and fully implementing the concept in a deployable prototype training system, called the Interagency Consensus Forum (ICF). The ICF Phase II prototype is an instructorless web-based training system designed to foster the development of the foundational consensus building knowledge and skills necessary for successful, integrated civil-military planning. To the extent possible given limited access to the ICF target user audience, all training was designed and implemented via an iterative design-test-refine process. A key design challenge was the development of distributed, collaborative multiparty negotiation role-play exercises, which represent the first of their kind in Army training. The ICF training complements related ARI-supported efforts to promote generalizable interpersonal knowledge and skill, including leader influence and negotiation. Further research and development will enhance the ICF's outreach and training effectiveness. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA535463>

RR 1935

The Impact of Accelerated Promotion Rates on Drill Sergeant Performance. (2011). Miller, M.L., James, D.R., & Cobb, M.G. (DTIC No. ADA535379).

This effort investigated if accelerated promotions have outpaced the ability of noncommissioned officers (NCOs) to gain the depth and breadth of experience and maturity needed to meet the challenges confronting today's Drill Sergeants (DSs) and Drill Sergeant Leaders (DSLs). This research focused on differences in NCO training and Army experiences, personality and demographic characteristics, and performance as a DS as rated by peers, leaders, and themselves. DSs, Company Commanders, and First Sergeants from 31 basic training Companies participated. This effort was also extended to the Drill Sergeant School in order to determine the impact of promotion timing on DSL performance. Results indicate that few differences exist between accelerated and non-accelerated promotion NCOs and these few differences generally reflect favorably on accelerated promotion DSs and DSLs. Moreover, these differences were more easily predicted by other characteristics, such as age, rank, and MOS division, than promotion timing. Recommendations for improving DS training are discussed. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA535379>

RR 1936

Problem Based Learning: Instructor Characteristics, Competencies, and Professional Development. (2011). Cianciolo, A.T., Grover, J., Bickley, W.R., & Manning, D.R. (DTIC No. ADA535416).

Preparing Soldiers to learn from problem-solving experiences requires that Army instructional practices become more responsive to individual student need, better attuned to operational requirements, and more representative of social learning contexts. To help instructors achieve this goal, the principles for facilitating problem-based learning must be investigated and their implications for professional development explicated. In this research, the instructor characteristics and competencies required to implement problem-based learning were explored. Techniques for instructor professional development in civilian and military contexts then were examined to identify best practices. The Army environment was assessed for its readiness to employ these best practices, and recommendations were developed. The findings suggest that the Army environment partially supports the development of problem-based learning facilitators. Recommendations emphasize transforming basic instructor preparation to be more outcomes-based and student-centered given the time, personnel, and resource constraints of the current Army environment. Ultimately, a comprehensive preparatory approach is needed that targets all implementers of Army education. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA535416>

RR 1937

Retention of Digital Skills: Command Post of the Future. (2011). Bink, M.L., Wampler, R.L., & Cage, E.A. (DTIC No. ADA535536).

The new generation of Army command-post digital systems, e.g., Command Post of the Future (CPOF), increasingly utilizes non-linear interfaces. Non-linear interfaces use a customizable workspace that is based on the user's needs rather than a static data format, and interaction with the interface is not based on prescribed or hierarchical sequences of steps. These characteristics of CPOF as well as the type of training typically received on the system suggested that CPOF skills should be susceptible to retention loss. This paper describes the results of a CPOF-skill retention experiment. Thirty-six Soldiers from CPOF training at two battle command training centers completed a skills test immediately following training and again five weeks after training. Although retention of CPOF skills was fairly robust, differences among the patterns of individual-skill retention were found. In addition, differences were found in CPOF-skill retention across types of skills. The pattern of retention was then used to identify the specific skills and the progression of skills that are critical in developing CPOF expertise.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA535536>

RR 1938

Evaluating a Problem Based Learning Strategy for Enhancing Ethical Awareness in Negotiation. (2011).

Pleban, R.J., Graves, T.R., Miller, M.L., Donigian, A.M., Branciforte, J.V., & Matthews, M.D. (DTIC No. ADA535714).

A problem-based learning strategy (Bransford & Schwartz, 1998) was used to develop a training protocol to enhance U.S. Military Academy (USMA) Cadets' awareness of ethical issues and decision-making processes in negotiation situations. The training protocol was tested in an upper-level course on negotiations at USMA. Cadets were assigned to either an experimental (training) or a control (no training) group. The experimental group was exposed to four negotiation scenarios at one-month intervals, and were asked to evaluate the scenario for potential ethical issues, to role-play the scenario in class, and then to evaluate their own and others' negotiation and ethical decision-making performances. Role-plays were followed by an after action review in which the instructor encouraged Cadets to discuss their ethical evaluation and decision-making processes. Following the fourth scenario, the instructor presented a lecture describing a thematic model of ethical sense-making (cf. Graves, Pleban, Miller, Branciforte, Donigian, Johnson, & Matthews, 2010) and how the model could be applied to facilitate decision-making across different contexts. Pre-post training assessments indicated that the training strategy significantly improved the experimental group's sensitivity to themes related to ethical sense-making and decision making in military specific situations relative to scores obtained from the control group. Also, post exercise ethical awareness scores correlated significantly with Cadets' negotiation strategies. The Cadets' responses to the training were favorable. The training strategy may be used to support experiential and dialogue-based professional military ethics training for officer Cadets and newly commissioned junior officers (ROTC, OCS, and USMA).

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA535714>

RR 1939

Training Aids for Basic Combat Skills: A Procedure for Training-Aid Development. (2011). Bink, M.L., Wampler, R.L., Dlubac, M.D., & Cage, E.A. (DTIC No. ADA544611).

There is a need to augment existing Army training approaches to address the differential rates and stages of learning evidenced among Soldiers. One way to easily modify existing training approaches is to make adjunct training aids available to trainers for use when appropriate. The fact that basic combat skills represent a heterogeneous skill set and are trained to Soldiers with large variability in skills and knowledge suggests that training aids may have a significant impact when used to train basic skills. This report describes a training-aid development process and provides a brief summary of training aids produced: a set of 200-meter zero targets, two aids to assist in the marksmanship zero process, material to reinforce and practice grid-coordinate skill, and a video capture and playback system. An assessment was conducted for each prototype training aid to determine its training value and to gain feedback for possible revisions. Each training aid contributed to enhanced Soldier performance. Details on the design, development, and assessment for each of the prototypes are provided in separate reports.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA544611>

RR 1940

Training Needs for RQ-7B Unmanned Aircraft System Operators in the Scout-Reconnaissance Role. (2011). Stewart, J.E., Bink, M.L., Barker, W.C., Tremlett, M.L., & Price, D.M. (DTIC No. ADB367652 / Restricted).

RR 1941

Training Aids for Basic Combat Skills: Developing Map-Reading Skill. (2011). Wampler, R.L., Bink, M.L., & Cage, E.A. (DTIC No. ADA556404).

The overarching goal was to develop a training aid that could be used by Initial Entry Training (IET) companies to assist Soldiers in improving map-reading skill proficiency. Training-aid development followed a five-phase process: Design, Development, Utilization, Assessment, and Revision. After developing two training aids, background information and hands-on practice, two IET companies completed the training-aid assessment process consisting of a test immediately following map-reading training, three weeks of using the aids, and a retention test. Low-performing Soldiers scored higher when they used the hands-on practice training aid and all Soldiers benefitted from the background-information training aid. The two separate packets were integrated into a single training packet that included both the background information and hands-on practice. Designing an adjunct training aid to be compatible with various levels of skill proficiency can be effective in improving training. The single packet will allow Soldiers to use the training aid without assistance and, because practice questions are of varying degrees of difficulty, will allow Soldiers at various skill levels to benefit.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA556404>

RR 1942

The Retention of Digital Skills Following Distributed and Traditional Training. (2011). Goodwin, G.A., Tucker, J.S., Wampler, R.L., Gesselman, A.N., & Johnson, V. (DTIC No. ADA542513).

As digital systems proliferate in the Army, there is a need for commanders to understand how to best maintain these critical warfighter skills. In the present report, skill retention for the Force XXI Battle Command Brigade and Below (FBCB2) digital system was investigated following traditional face-to-face training and distributed learning (dL) training. This second type of training was examined because little is known about training digital skills using this method. Operator skills were measured immediately and eight weeks following the training. There were no differences in overall performance between the dL and traditional students at baseline suggesting this system can be trained effectively in a dL environment. Both groups also showed similar rates of forgetting after the eight-week retention interval. Overall performance declined significantly from 71% of steps correct at baseline to 62% correct eight weeks later. Characteristics of the digital system and of the participants contributed to forgetting. These findings indicate that FBCB2, and presumably other digital systems can be effectively trained in a dL environment. Additionally system and individual characteristics that contribute to skill decay were identified and can be used to both improve system training and system design.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA542513>

R 1943

Developing Performance Measures for Army Aviation Collective Training. (2011). Seibert, M.K., Diedrich, F.J., Stewart, J.E., Bink, M.L., & Zeidman, T. (DTIC No. ADA544425).

Army Aviation tactical training exercises usually involve an entire Battalion or Combat Aviation Brigade (CAB). Due to cost and logistical considerations, the Army's aviation tactical exercise (ATX) takes place in a shared virtual environment employing networked simulators and training devices. ATX employs state of the art technology; however, objective measurement of team performance has not kept abreast of aviation simulation technology. It is unclear how observational ratings and electronic system data (from simulators) can be used to assess team performance and provide actionable feedback to unit commanders and trainees. To address these challenges, we: (1) determined the dimensions that differentiate high-performing aviation teams from low-performing aviation teams in scout- attack missions at the Battalion and Company levels; (2) determined collective-task dimensions that can be captured using simulator data during ATX, and (3) constructed behaviorally-based prototype measures to assess unit-level performance for those collective task dimensions not represented by simulator data. Future implementation of system-based and observer-based measures of collective task performance should lead to improved assessment of training strategies at ATX where CABs prepare for deployment. Refinement of these measures should likewise provide specific, diagnostic feedback to commanders on their unit's progress during virtual and live training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA544425>

RR 1944

Behavioral, Attitudinal, and Cultural Factors Influencing Interagency Information Sharing. (2011). Schaab, B.B., DeCostanza, A.H., & Hixon, C. (DTIC No. ADA554024).

This research examined factors influencing information sharing between distributed organizations. Participating in a U.S. Joint Forces Command sponsored experiment, interagency partners conducted planning for simulated crises, with each organization working from their own location, utilizing their own information sharing technology to exchange information. Participants completed a pre- and post-experiment questionnaire, which examined factors influencing interagency information sharing. Findings suggest that organizational culture, attitudes toward information sharing, perceived interdependence, and trust are likely to influence information sharing behaviors and collaboration. Experiences throughout interagency experiments and exercises can shape future collaboration attitudes, so simply coming together to interact in an event will not necessarily result in better collaboration in the future. Suggestions for enhancing interagency collaboration based on questionnaire results and observations are presented.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA554024>

RR 1945

Training Aids for Basic Combat Skills: A Video Feedback System. (2011). Wampler, R.L., Dlubac, M.D., & Bink, M.L. (DTIC No. ADA544612).

The overarching goal was to develop a training aid that could be used by Initial Entry Training (IET) companies to provide timely performance feedback to Soldiers. Training-aid development followed a five-phase process: Design, Development, Utilization, Assessment, and Revision. The training aid consisted of compact and light-weight cameras and projectors to record and playback training events. Drill Sergeants (DSs) from seven different IET companies recorded activities during over 30 training events. Users stated that the camera was useful for collective training events, but not for some of the desired activities during individual training events. Shortcomings included an inability to zoom-in to see close-up details, no means to playback the video in slow motion, and the requirement for an adequate light source to capture a viewable image. The projector was rarely used. In addition, the most prevalent response from DSs was that the rapid pace of the training schedule and the high Soldier-to-DS ratio made it unrealistic to attempt to provide immediate performance feedback to Soldiers. The video capture and playback system did not meet the purposes of an IET training environment, but the research led to an understanding of future requirements for such a system.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA544612>

RR 1946

Evaluating a Job Aid for Actions on Contact at the Joint Readiness Training Center. (2011). Evans, K.L., Blizzard, J.J., Jones, J.E., & Ryan, W.C. (DTIC No. ADA545882).

The present investigation sought to quantify small unit practices during actions on contact at the Joint Readiness Training Center (JRTC) and to determine the extent to which a job performance aid, the Warrior Leader's Guide for Actions on Contact, might improve unit performance. The Actions on Contact Checklist, a tool developed especially for the investigation, was used by JRTC's trainer/mentors to measure unit performance. Over the course of nine unit rotations at JRTC, 754 checklists were collected and analyzed. Some support for the efficacy of the Warrior Leader's Guide to positively influence unit performance was found, primarily in the consolidation and reorganization phase of operations. Unit strengths and weaknesses in actions on contact were identified.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA545882>

RR 1947

Training Aids for Basic Combat Skills: Obtaining a 200 M Zero with M16 Rifle and M4 Carbine. (2011). Bink, M.L., Dlubac, M.D., Cage, E.A., & Wampler, R.L. (DTIC No. ADA557028).

The overarching goal was to develop a training aid that could be used by Initial Entry Training companies to assist Soldiers to improve weapon-zeroing proficiency. More specifically, the research reported here addressed the need for targets and training aids for a 200 m zero. Training-aid development followed a five-phase process: Design, Development, Utilization, Assessment, and Revision. Ballistically-accurate targets for initial zeroing and confirm zero were developed as well as sight-adjustment practice flashcards and a marksmanship fundamentals coaching card. The training aids were designed to structure peer-learning contexts and support feedback in peer learning. Comparison of

the developed targets to standard 300 m zero targets modified for 200 m zero showed that the new 200 m zero targets provided more consistent and accurate zeroing performance and supported the maintenance of skill across training events. Soldiers reported that the sight-adjustment and coaching cards were helpful. After minor modifications, the 200 m zero targets were transitioned to the U.S. Army Training and Doctrine Command Capabilities Manager for Live Training for distribution.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA557028>

RR 1948

Training Platoon Leader Adaptive Thinking Skills in a Classroom Setting. (2011). Pleban, R.J., Vaughn, E.D., Sidman, J., Geyer, A., & Semmens, R.P. (DTIC No. ADA544978).

A problem-based learning (PBL) strategy (Schwartz & Bransford, 1998) was used to develop a training protocol to enhance Infantry lieutenants' adaptive thinking/problem solving skills in the context of a mission planning exercise. The training protocol was tested using recent graduates of the Infantry Basic Officer Leader Course (IBOLC). Participants were assigned to either an experimental (PBL training) or a control (partial treatment) group. Both groups were exposed to four planning exercises over an eight-hour instructional period and asked to develop, individually, a platoon offensive operation order (OPORD), and then modify their order based on additional information (two fragmentary orders - FRAGOs). Following the first FRAGO, the instructor presented a lecture to the experimental group describing key conceptual points and their relevance to the mission planning process. After additional practice (FRAGO 2), the groups were then presented with another mission-stability operation, which served as the transfer task. Analysis of the performance-based mission planning ratings showed that the experimental group's performance did not significantly differ from that of the control group (no lecture). With regard to participant self-reports of the training, the control group's attitudes toward various aspects of the instruction were generally more positive than those of the experimental group. A major impediment to the training was the inadequate time allocated to effectively execute the instruction. Specific issues related to employing a PBL strategy in a military classroom environment were identified. These issues included the duration and structure of the training events (i.e., OPORD, FRAGOs, and transfer task), instructor preparation, control group design, classroom size, and development of metrics for measuring deep understanding. Each of these areas is briefly discussed. In summary, the findings indicate that revisions to both the instructional design and content of the training module are needed if PBL instruction is to be used successfully in the development of adaptive thinking skills in an institutional training environment.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA544978>

RR 1949

Non-Cognitive Predictors and Test Score Category 3B Market Expansion: Examining MOS Impacts. (2011). Sticha, P.J., Diaz, T.E., Weaver, E.A., & Greenston, P.M. (DTIC No. ADA546688).

ARI has been investigating the potential that non-cognitive predictors could play in expanding the supply of highly-motivated AFQT test score category (TSC) 3B applicants. The initial research effort was known as the Expanded Enlistment Eligibility Metrics (EEEM) project, and preliminary results were encouraging: non-cognitive predictors have been tested that appear to identify a subset of TSC 3B applicants with predicted attrition (and possibly job performance) comparable to that of TSC 1-3A applicants. One concern regarding the implementation of these new predictors is whether an increase in TSC 3B applicants and a corresponding decrease in TSC 1-3A applicants would have repercussions for Army MOS TSC 1-3A goals. The objective of this effort is to estimate the effect of illustrative increases in the number of TSC 3B applicants on the allocation of applicants to their initial MOS training. The objectives were addressed with application of the Enlisted Personnel Allocation System (EPAS) model, designed to simulate the allocation / classification process.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA546688>

RR 1950

Tailored Training in Army Courses. (2011). Dyer, J.L., Wampler, R.L., & Blankenbeckler, P.N. (DTIC No. ADA552439).

The research aimed to identify the different ways in which Army course instructors adapt or tailor their training to meet student needs. Interviews with 81 instructors from 51 courses across four installations were conducted. No single template existed regarding how instructors tailored their training, and some typical modes of tailoring were not described. Instructors provided details of how their courses were conducted, and they also discussed the impediments to tailored training. Characteristics of the courses and the instructors that increased the likelihood of tailored training were defined. Courses that have

well-defined and enforced graduation requirements aimed at producing students with a high level of proficiency were the ones most likely to tailor training to student needs. The results imply that tailoring in Army courses, as a whole, is probably limited. The major factors related to tailored training, to include instructor expertise with relevant pedagogical skills and assessment techniques, are integrated in an overall model. Considerations regarding how to initiate tailoring in courses, and questions regarding tailored training in the Army that emerged from the research are presented.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA552439>

RR 1951

Advising Foreign Security Forces: Critical Incidents Describing the Work of Advisors. (2011). Zbylut, M.L., Metcalf, K.A., & Brunner, J.M. (DTIC No. ADB375068 / Restricted).

RR 1952

Measuring Noncommissioned Officer Knowledge and Experience to Enable Tailored Training. (2011). Schaefer, P.S., Blankenbeckler, P.N., & Brogdon, C.J. (DTIC No. ADA552941).

Tailoring training can improve effectiveness and efficiency. However, before informed decisions regarding tailoring Army institutional training can be made, instruments which predict performance must be available. To that end, instructors from the Infantry Advanced Leaders Course at Fort Benning, GA were interviewed to determine which course criteria exhibited large variation in student performance. Based on those interviews, two criteria were chosen: land navigation and troop leading procedures. Four types of predictors were constructed for each criterion. The first type was predictive judgments of Soldier criterion performance. The second type was demographic items. The third type was self-report items concerning specific, criterion-relevant experiences. The fourth type was prior knowledge tests. For each criterion, prior knowledge alone significantly predicted performance. The different nature of the criteria has implications for both the construction of prior knowledge tests and how prior knowledge tests can be used to predict performance. Ways in which these results can be translated into user-friendly tools for course managers, instructors, and other relevant personnel are illustrated.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA552941>

RR 1953

Measuring Officer Knowledge and Experience to Enable Tailored Training. (2011). Schaefer, P.S., Blankenbeckler, P.N., & Lipinski, J.J. (DTIC No. ADA552440).

Tailoring training can improve effectiveness and efficiency. However, before informed decisions regarding tailoring Army institutional training can be made, instruments that predict performance must be available. Instructors from the Engineer Captains Career Course at Fort Leonard Wood, Missouri, were interviewed to determine which parts of the course could best distinguish the performance of different officers. Based on those interviews, performance on the Defensive Planning exam was chosen, as it clearly indicated some officers as performing well, some average, and some poorly. Five types of predictors were constructed to assess how they were related to how well officers performed on the Defensive Planning exam. The first was small group instructors' forecasts of officers' later performance on their Defensive Planning exams. The second was general biographic characteristics of the officers, which anecdotal evidence indicated instructors used to assess relevant experience. The third was officers' scores on a measure that asked questions relevant to their Defensive Planning training and educational experiences. The fourth asked officers to rate their own ability to execute activities related to Defensive Planning. The fifth type was a test of prior knowledge. Results showed that prior knowledge alone predicted criterion performance, but only for officers with no prior enlistment experience. In addition, the interrelationships among the variables differed markedly between officers with prior enlisted experience and officers without. These results underscore the need for empirically validating performance predictors in Army courses. We discuss in detail how these findings enable instructors to make informed decisions about tailoring training.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA552440>

RR 1954

Incorporating Army Design Methodology into Army Operations: Barriers and Recommendations for Facilitating Integration. (2012). Grome, A., Crandall, B., Rasmussen, L., & Wolters, H.M. (DTIC No. ADA559673).

With the March 2010 publication of FM 5-0, The Operations Process, the U.S. Army formally introduced Design into its doctrine (Headquarters; Department of the Army, 2010). Design is defined in FM 5-0 as a methodology for applying critical and creative thinking to understand, visualize, and describe complex,

ill-structured problems and develop approaches to solve them? (p. 3-1). Though many people contend that successful commanders have always performed Design, the codification of Design in doctrine represents a significant organizational change for the Army. Organizational change efforts are often met with resistance, and the intended benefits of the change may go unrealized. The goal of this research effort was to identify and document significant organizational barriers to integrating Design into Army operations, and develop recommendations for mitigating those barriers. The research team conducted a literature review and in-depth interviews with subject-matter experts to identify obstacles to adoption of Design. A number of barriers have the potential to create significant impediments to the integration of Design, including: terminology and language barriers, conceptual barriers, organizational culture barriers, command-level barriers, and applications barriers. A series of recommendations are made for mitigating the identified challenges and facilitating the integration of Design into Army operations. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA559673>

RR 1955

Assessment of New Marksmanship Strategies in 2010. (2012). Dyer, J.L., Lipinski, J.J., Schaefer, P.S., Goodwin, G.A., James, D.R., & Dlubac, M.D. (DTIC No. ADA559371).

In response to the Deputy Commanding General for Initial Military Training, new marksmanship strategies for Infantry One Station Unit Training (OSUT) and Basic Combat Training (BCT) were compared. OSUT Soldiers scored significantly higher than BCT Soldiers on Record Fire and Combat Field Fire (CFF) with the difference being substantial on CFF. The OSUT CFF scores supported the advanced rifle marksmanship (ARM) strategy which included different scenarios and more ammunition than the BCT ARM strategy. Results also supported the use of combat gear by OSUT in basic rifle marksmanship (BRM). Round allocation for grouping and zeroing was inadequate with 5-round shot groups. Overall, the Practice Record Fire and Record Fire patterns showed that Soldiers benefitted from Practice Record Fire. Equipment and time limitations hindered the ability to fully train optics for BCT Soldiers, and to train night fire with aiming lights and night vision goggles for both BCT and OSUT Soldiers. Soldiers also indicated they needed more training with this equipment. The CFF hit standard in the marksmanship FM was validated. Current and prior research on 3-and 5- round shot groups showed that similar numbers of shot groups were required to group and zero regardless of shot group size. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA559371>

RR 1956

Unmanned Aircraft Systems in the Scout-Reconnaissance Role: Perceptions of U.S. Army Manned and Unmanned Communities. (2012). Stewart, J.E., Roberts, K.R., & Bink, M.L. (DTIC No. ADA563620).

Historically, U.S. Army unmanned aircraft systems (UAS) served as intelligence-gathering platforms. The role of the UAS has recently changed to scout-reconnaissance (SR). The current research effort investigated perspectives of members of Army manned and unmanned aviation communities on capabilities of UAS operators to perform the Army Aviation SR role. A questionnaire addressing perceptions of the capabilities of UAS in SR operations was distributed to 34 U.S. Army helicopter pilots and 31 UAS operators. Pilots and UAS operators agreed that UAS operators must assume a more active SR role and that this role was essential for UAS. UAS operators indicated that UAS will be able to perform many of the roles currently performed by manned scout and attack helicopters. However, pilots indicated that the role of UAS primarily will be to assist and support helicopters and not to supplant the manned role. Likewise, the majority of respondents indicated that each of eight SR mission skills was appropriate for both manned aircraft and unmanned aircraft although response patterns between pilots and UAS operators differed for most skills. The differences in perceptions indicated a need for additional tactical-skills training for UAS operators and opportunities for joint training with UAS operators and pilots. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA563620>

RR 1957

An Examination of Advanced Individual Training Platoon Sergeant Training and Experiences. (2012). Graves, T.R., James, D.R., & Cobb, M.G. (DTIC No. ADA564897).

The Deputy Commanding General for Initial Military Training requested research to identify and examine factors impacting Advanced Individual Training (AIT) Platoon Sergeant (PSG) and Squad Leader (SL) performance and motivation (1) to understand better their unique duty expectations and how to optimize training for their new positions and responsibilities, (2) to define the stressors affecting AIT PSGs' and SLs' performance and identify strategies/tools to reduce their impact on PSGs' and SLs' effectiveness

and motivation, and (3) to examine the support and resourcing provided to PSGs and SLs to perform their duties in order to identify best practices that could be applied across AIT. The findings from this effort provide critical information to commanders, decision makers, and training designers regarding the effectiveness of the AIT Platoon Sergeants Course and unit certification programs, as well as identify practices to enhance AIT PSG and SL performance and motivation.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA564897>

RR 1958

Addressing Army Aviation Collective Training Challenges with Simulators and Simulations Capabilities. (2012). Seibert, M.K., Diedrich, F.J., & Ayers, J.M., Dean, C., Zeidman, T., Bink, M.L., & Stewart, J.E. (DTIC No. ADA565888).

As the U.S. Army continues development of a Live-Virtual-Constructive Integrated Training Environment, the reliance on aviation simulators and simulations will take on more importance in the overall aviation collective training mission. Consequently, refinement of requirements for simulation and simulator capabilities and their effective utilization are essential. The primary objective of the research reported here was to identify Army aviation collective training challenges and to compare those needs to current (and planned) collective simulation capabilities. The specific gaps among collective training challenges, simulation capabilities, and simulation utilization can be used to inform simulation development and to guide training development. Based on the findings, a simulation-training analysis tool was developed that maps the training challenges to simulation-training resources. The resulting analysis tool facilitates data-driven recommendations for maximizing use of current and planned simulations-training resources to meet key training challenges. Overall, the findings suggested that while current simulation-training resources address many training challenges, some capability gaps exist, and there are multiple opportunities to increase the effective utilization of simulation-training resources given current capabilities.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA565888>

RR 1959

Impact of the Phase 2 Infantry Advanced Leader Course. (2012). Pleban, R.J., Miller, M.L., Vaughn, E.D., James, D.R., Wampler, R.L., & Blankenbeckler, P.N. (DTIC No. ADA566150).

A longitudinal research effort assessed the training value of the revised Infantry Phase II ALC on Soldier job performance (near transfer) and determined the impact of relevant training inputs (i.e., trainee characteristics, training design, and work environment factors) on the transfer process. Data from questionnaires, interviews and performance ratings were collected pre- and post-ALC and 3-5 months later at the students' unit from ALC students, supervisors, and peers. The research findings suggest that ALC positively impacted students' confidence to employ both NCO competencies and ALC tasks. Moreover, this confidence did not decline substantially when reassessed three to five months later at the unit. Nevertheless, additional findings indicated that ALC could be improved. Areas addressed included modifying the structure and format of the ALC to take advantage of the more experienced students' knowledge and background, ensuring comparability between the resident and MTT versions of ALC, providing more hands-on experiences, deleting modules with minimal training value/opportunities for professional growth, selecting and training qualified cadre, setting and enforcing achievable course standards, and selecting qualified students to attend ALC. Issues related to various training input variables affecting transfer of ALC knowledge and skills to job performance were also addressed. Finally, suggestions for enhancing learning and transfer in ALC were provided.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA566150>

RR 1960

Development of a Competency Model for Civil-Military Teaming. (2012). Ross, K.G., Thornson, C.A., Wisecarver, M.M., Foldes, H., Key-Roberts, M., Schaab, B.B., Peluso, D.A., & Prevou, M.I. (DTIC No. ADA567464).

The nature and complexities of today's military operations are such that no single organization, department, or agency has all the requisite resources, authority, or expertise to single-handedly provide an effective response. These operations require civil-military teaming (CMT). CMT involves establishing, managing, and participating in collaborations among various military, governmental, non-governmental, local national leadership and civilian agencies. In order to ensure that Army leaders are trained and developed appropriately to meet CMT requirements, it is critical to establish the competencies required for success in these environments. Research was conducted in three phases to develop requirements for successful teaming performance. The first phase involved a domain analysis and review of relevant

literature to develop an initial competency model. The second phase consisted of data collection efforts to validate the preliminary model. The third phase reviewed existing training and education opportunities. Results suggest a CMT competency model that has three higher-order meta-competencies and 12 lower level competencies. Thirty-two specific decision points that present significant performance challenges during CMT are also described. Recommendations regarding further validation, training, and development of the competency model are discussed, a decision requirements table provides context for future training, and the identification of gaps in existing training and education are discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA567464>

RR 1961

Self-Learning Among Army Noncommissioned Officers: Experiences, Attitudes, and Preferred Strategies. (2012). Graves, T.R., Rauchfuss, G., & Wisecarver, M.M. (DTIC No. ADA565313).

U.S. Army Noncommissioned Officers (NCOs) often need to complete tasks they were not formally trained to do, requiring them to learn on their own. This research focused on describing and measuring the preferred self-learning attitudes and self-learning strategies of successful Army NCOs. Focus groups were used to collect data on successful NCOs' (N = 123) experiences of self-learning. The interview data were analyzed to develop a thematic framework that described these experiences. Based on this framework, the NCO Self-Learning Strategies Questionnaire was developed and then administered across several Army NCO academies to assess NCOs' (N = 1,345) preferences for particular self-learning attitudes and strategies. Findings indicated that these NCOs had consistent preferences for certain self-learning strategies, although variables such as career intentions, career management field, years in service, were associated with some differences in self-learning preferences between groups. Another key finding was that Senior NCOs appeared to be more selective about preferred self-learning strategies than were junior NCOs. This research contributed to a better scientific understanding of the first-person experience of self-learning, particularly among Army NCOs. The research effort was sponsored by the Institute for Noncommissioned Officer Professional Development and was used to inform their ongoing training and development initiatives.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA565313>

RR 1962

Identifying Critical Manned-Unmanned Teaming Skills for Unmanned Aircraft System Operators. (2012). Sticha, P.J., Howse, W.R., Stewart, J.E., Conzelman, C.E., & Thibodeaux, C. (DTIC No. ADA565510).

Manned-unmanned teaming (MUM-T) requires that unmanned aircraft systems (UAS) interoperate with attack and scout-reconnaissance (SR) helicopters. The objectives of this research were as follows: (1) identify SR skills required for UAS operators, (2) define/prioritize training-critical MUM-T skills, and (3) determine performance indicators for these skills. First, Army doctrine and regulations were reviewed to identify missions in which UAS operators must coordinate with helicopter pilots, tasks required to perform these missions, and the skills required to execute these tasks. A list of candidate MUM-T skills was compiled and then confirmed by a focus group of Army subject matter experts (SMEs) from both manned and UAS communities. SMEs then identified training-critical MUM-T skills for which inadequate performance jeopardized the mission, and UAS operators graduating advanced individual training (AIT) performed poorly. Skills were rated and then ranked for training criticality, resulting in a list of 25 MUM-T skills. SMEs proposed indicators for the 20 MUM-T skills deemed most relevant. A total of 140 performance indicators were identified. The results of this research can be used to identify and prioritize training needs, select training methods, and develop means of assessing performance for MUM-T skills.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA565510>

RR 1963

Training Joint, Interagency, Intergovernmental, and Multinational Participants for Stability Operations. (2012). Ong, J.C., Ross, K.G., Schaab, B.B., Prevou, M.I., Baxter, H.C., Grome, A., Spangler, D., & Loughran, J. (DTIC No. ADA565509).

This project supports training Joint, Interagency, Intergovernmental and Multinational (JIIM) participants for planning and implementing Stability Operations. Based on a literature review and subject matter expert interviews, a set of themes was developed that reflect the high-level cognitive skills that experts use to be successful in JIIM environments. Then a collection of computer-based training tutorials was developed and pilot-tested by students at the U.S. Army Command and General Staff College (CGSC). Traditional training systems present information and then test Soldiers' recall. By contrast, these tutorials interweave the learning of FM 3-07 and other doctrine with problems and scenarios. This

approach has been shown to accelerate learning by providing scenario-based learning goals and contexts for acquiring, integrating, and retaining declarative knowledge more effectively.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA565509>

RR 1964

Front-End Analysis Methods for the Noncommissioned Officer Education System. (2013). Miller, M.L., Phillips, J., Gomez, M.D., & Finerson, P. (DTIC No. ADA578233).

The Noncommissioned Officer Education System plays a crucial role in Soldier development by providing both institutional training and structured-self development. New tasks emerging from the operational environment and changes in tactics, techniques and procedures associated with existing tasks created challenges with maintaining currency of institutional training. Questions have arisen regarding the optimal placement of tasks as their relevance changes, especially considering the resources required to update institutional training. An analysis was conducted to identify the characteristics of tasks that are enduring across operational environments versus non-enduring, and the factors considered for optimal placement of tasks in training sites. Twelve discriminating factors were encapsulated in a front-end analysis methodology and Site Selection Tool (SST). The SST is designed to improve the effectiveness and efficiency of site recommendations by Critical Task Site Selection Boards (CTSSBs), by improving the process by which individuals apply their experience to judge optimal training sites. User feedback indicates the SST results in their applying more thought and considering a broader range of factors when deliberating task placement, and reliably flags for group discussion those tasks requiring a dialogue regarding optimal site placement.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA578233>

RR 1965

Defining Tailored Training Approaches for Army Institutional Training. (2013). Schaefer, P.S., & Dyer, J.L. (DTIC No. ADA578565).

The Army places a premium upon effective and efficient training. However, what constitutes effective and/or efficient training varies from group to group and individual to individual. For decades researchers have explored the extent to which training quality can be improved by tailoring training, defined as assessing salient individual differences and assigning learners to learning conditions based on those differences. Feasible tailored training research in Army contexts, however, requires an understanding of the academic research in tailored training, a grasp of which methods of tailoring are (in) effective and under what conditions, and an understanding of how differences between Army institutional training settings and academic research settings and populations might impact the generalizability of results. This report summarizes the research literature and determines the major areas of tailored training research. These areas are ability grouping, learning in small groups, tutoring, microadaptation, learning styles, and aptitude-treatment interactions (ATI). The report then determines what types of tailored training are most effective and under what conditions. Of the six areas, only learning styles was deemed ineffective. Each of the remaining areas demonstrated significant tailored training effects. The report provides suggestions for tailored training research with near-term applicability in Army settings. Suggestions for near-term applicable tailored training include focusing on small groups, microadaptation in one-on-one remedial training settings, and ATI research. In ATI, the critical aptitude is prior knowledge. Emphasis is placed on first experimentally assessing the extent and nature of ATI in Army settings and then verifying those findings in classroom settings.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA578565>

RR 1966

Comparison of Direct Instruction and Problem Centered Instruction for Army Institutional Training. (2013). Pleban, R.J., Blankenbeckler, P.N., Wampler, R.L., Dlubac, M.D., & Perdomo, B. (DTIC No. ADA578566).

A direct instruction (DI)-based and a problem-centered instruction (PCI)-based version of an Army training module (NCO Evaluation Report Preparation) were constructed and administered to different Infantry Advanced Leader Course classes. A common post-test addressing both the well-defined and the ill-defined elements of the module was administered to all students. The hypothesis was that DI students would out-perform PCI students on tests of well-defined elements, while PCI students would out-perform DI students on tests of ill-defined elements. The results showed no statistically significant differences between DI or PCI students on either well-defined or ill-defined elements. Discussion of the results addresses methodological issues in comparing DI with PCI methods, and issues in trading training cost vs. training effectiveness in making choices among instructional models.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA578566>

RR 1967

A Practical Decision Guide for Integrating Digital Applications and Handheld Devices into Advanced Individual Training. (2013). Keller-Glaze, H., Horey, J., Nicely, K., Brusso, R.C, Nihill, M.M., & Cobb, M.G. (DTIC No. ADA587623).

The objectives of this research were to (1) identify and evaluate lessons learned from selected Connecting Soldiers to Digital Applications (CSDA) pilot tests for the development, integration, and sustainment of digital training applications and handheld devices in Advanced Individual Training (AIT), and (2) develop a practical decision guide for key decision makers determining the utility of digital applications and mobile technologies for AIT and developing metrics for accessing their impact on training. A literature review was conducted and data were collected from subject matter experts who had participated in CSDA pilot tests. Results were organized into 10 factors and 35 associated subfactors related to the topics of training methods and delivery, human and contextual factors, and hardware and infrastructure capabilities and constraints. A decision guide was developed to help inform key decision makers about factors associated with the use of digital applications and handheld devices in training. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA587623>

RR 1968

Backwards Fading to Speed Task Learning. (2013). Schaefer, P.S., Irvin, C.R., Blankenbeckler, P.N., & Brogdon, C.J. (DTIC No. ADA590615).

In Backwards Fading (BF), a learner is provided with an initial, complete demonstration of a multi-step task. In subsequent iterations, more and more of the later task steps are completed by the student. Thus, task performance shifts from the instructor to the student. BF can be understood as a systematic means of removing scaffolding across learning trials. Research indicates BF holds promise for effective/efficient training, but the utility of BF in Army settings and with Army tasks needs to be empirically evaluated. To that end, Soldiers (N = 215) participated in two experiments. In the first experiment, Soldiers were BF trained on tasks judged by SMEs to be of comparatively low or high complexity. In the second experiment, Soldiers were trained via gradual ('step') or accelerated ('block') BF on a cognitive or a procedural task. Results indicated that the BF approach was effective, with 'Go' rates ranging from 77% to 99% on all tasks. The data exhibited weak but consistent trends in the directions hypothesized: more complex tasks yielded poorer performance than less complex tasks (Experiment 1) and more accelerated BF resulted in poorer performance than gradual BF (Experiment 2). Recommendations for utilizing BF in Army settings are provided. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA590615>

RR 1969

Addressing Point of Need in Interactive Multimedia Instruction: A Conceptual Review and Evaluation. (2013). Blankenbeckler, P.N., Graves, T.R., & Wampler, R.L. (DTIC No. ADA593946).

The Army Learning Model (ALM) emphasizes a learner-centric approach to education and training and application of digital technologies to address learners' points of need. The point of need concept is focused both on the accessibility of information to support the learning process as well as designing learning materials to address individual differences in learners' experiences, background knowledge, and job-specific requirements. In this research we focused on determining how to apply instructional design techniques and tailored training strategies to address different learners' needs in the context of interactive multimedia instruction (IMI). This was accomplished on the basis of an extensive review of existing Army IMI to determine the relevance of various instructional designs and tailored training strategies to address point of need. Starting with a sample of N = 427 IMI modules, we reduced the sample (N = 179 modules) by focusing only on IMI relevant to Combat Arms/Maneuver, Fires, and Effects and Squad/Team Leaders. Findings indicated that much of existing Army IMI was designed to be applicable to the largest possible audience rather than address individual learners' needs. Here, we recommend principles and strategies that may be incorporated into the design of IMI to better address individual learners' needs. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA593946>

RR 1970

Tests of a Prior Marksmanship Knowledge Predictor Test. (2014). Lipinski, J.J., James, D.R., & Wampler, R.L. (DTIC No. ADA597406).

The research sought to determine whether performance on a prior knowledge test of marksmanship added any predictive power beyond that from simply asking Soldiers if they have experience shooting outside of a military context (e.g., hunting). We tested the relationship between marksmanship prior knowledge and the shooting performance of 54 students across three classes of the Army Squad Designated Marksmanship (SDM) Course and 184 Soldiers during Infantry One Station Unit Training (OSUT) on the Basic Rifle Marksmanship (BRM) qualification course of fire. We found that prior knowledge did significantly predict marksmanship performance beyond any effects of prior shooting experience outside of the military in both the SDM and BRM groups. However, the effect size for BRM was too small to be useful for effective instructional grouping for BRM.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA597406>

RR 1971

Assessing the Tailored Adaptive Personality Assessment System. (2014). Nye, C.D., Beal, S.A., Drasgow, F., Dressel, J.D., White, L.A., Stark, S. (DTIC No. ADA596904).

This report describes research that examined whether the Tailored Adaptive Personality Assessment System (TAPAS) may be useful for identifying Army Soldiers who will perform well in an Army Special Operations Forces (ARSOF) assessment and selection course. TAPAS data were collected from 1,216 Soldier-candidates attending the ARSOF course and were used to predict selection for ARSOF training. Results indicated that several scales were significantly related to Soldier selection and that the TAPAS was useful for differentiating candidates who were successfully selected for ARSOF training from Soldiers who withdrew from the assessment and selection course, either voluntarily or involuntarily. Therefore, the TAPAS appears to be useful for predicting selection following the ARSOF course. Future research directions that can help to expand these findings are discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA596904>

RR 1972

Validation and Evaluation of Army Aviation Collective Performance Measures. (2014). Bink, M.L., Dean, C., Ayers, J.M., & Zeidman, T. (DTIC No. ADA596907).

Simulation-based Aviation Training Exercises are critical for preparing U.S. Army Combat Aviation Brigades for deployment. However, while offering the opportunity to practice mission segments at the unit level, the effectiveness of this training remains unclear due to a need for objective assessments focused on observable team behavior. Unit Commanders and trainers need tools for measuring collective task performance in order to understand performance gains, facilitate feedback, and guide the learning of aviation tactical teams. To address this challenge, a set of aviation team performance measures were developed, data were collected to validate these measures, and strategies were created to facilitate application of the measures to collective training events. The measures used behaviorally-based observations to assess performance of aviation tactical teams. The measures were evaluated at multiple training events to assess overall utility. Data were collected on inter-rater reliability and on agreement between the measures and overall mission performance. Results provided evidence of both acceptable reliability and validity for the measures. Moreover, requirements were developed for electronic data collection tools that can be used by unit Commanders and trainers to assess team performance at collective training exercises.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA596907>

RR 1973

Tailored Training in Vehicle Maintenance Courses. (2014). Cobb, M.G., Schaefer, P.S., Stallings, G.M., Blankenbeckler, P.N., & Wampler, R.L. (DTIC No. ADA603889).

A central tenet within the Army Learning Concept 2015 (ALC 2015) and Army Learning Model (ALM) is the need to transition to learner-centric methods and processes that develop critical competencies through rigorous, tailored, outcome-oriented learning experiences. Previous research conducted by the U.S. Army Research Institute (ARI) Ft. Benning Research Unit showed that tailored training in the Army is most likely to occur in technical, functional courses where graduates must be proficient in clearly defined skills, based on specified performance standards, upon graduation. However, there has been little research focused on identifying the actual different tailored training strategies employed in divided small group training based on interpersonal interactions or how the nature and frequency of these interactions affect subsequent student learning or task performance. This effort addresses gaps identified in previous research conducted on tailored training approaches and examines specific training issues raised by the 3-81st AR BN at Ft. Benning, GA. The first objective of the research was to identify potential predictors of performance at different stages of training in the 91A and 91M AIT courses that

will enable instructors to better identify strong and weak Soldiers. The second objective was to examine small group processes in both courses to identify the nature and extent of tailored training, peer-to-peer interaction, and how tailoring varies with group composition. The final objective was to examine the effectiveness and other impacts of the Blended Rotation Interactive Technology Environment (BRITE) technologies employed in training (91M course only) on training outcomes.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA603889>

RR 1974

Evaluating Mobile Device Ownership and Usage in the U.S. Army: Implications for Army Training. (2014). Mercado, J.E., & Spain, R.D. (DTIC No. ADA603886).

As the U.S. Army transitions its training strategy to meet the goals of the Army Learning Model (ALM), there will be a commitment to leverage mobile devices for Soldier training and education. The ease of this transition will be determined, in part, by the extent to which Soldiers are already familiar with mobile devices, use them in their daily lives, and their willingness to incorporate them into their professional lives. This paper reports findings on mobile device ownership, usage, and willingness to use an issued smartphone from the U.S. Army Research Institute for the Behavioral and Social Sciences 2011 Spring Sample Survey of Military Personnel (SSMP) and a 2011 Mobile Device Usage Questionnaire of university students. Results suggest that most Soldiers own some sort of mobile device. However, contrary to popular assumption, many young Soldiers do not report owning a smartphone. Conversely, a high percentage of younger Soldiers reported owning other mobile devices, such as a tablet or e-Readers. Soldiers that own mobile devices use them regularly for a variety of tasks. Finally, results show that we can assume that if the Army leverages mobile devices as tools for training, Soldiers will embrace them and use them.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA603886>

RR 1975

Army Instructors' Use of Mobile Devices in the Infantry Advanced Leaders Course. (2014). Wampler, R.L., Wolfe, D.L., Nihill, M.M., Bickley, W.R., & Reyes, G. (DTIC No. ADA608384).

In contrast to investigating the educational effects of mobile devices on students, this research aimed to investigate the potential utility of supplying instructors (rather than students) with mobile devices to be used in conducting training. Following a review of the state of mobile devices development and potential mobile applications, a suitable tablet was selected and provisioned with apps. U.S. Army Infantry Advanced Leaders Course instructors utilized the tablets during three separate course iterations. Instructors utilized the tablets as much or as little as they felt the tablets to be useful, and submitted weekly feedback regarding how often and in what ways the devices were utilized during training. Debriefing sessions were conducted at the conclusion of each course. Instructors had mixed feedback regarding the potential utility of computer tablets for implementation. Overall, instructors saw some promise for the future potential of tablet devices for instructor use, but encountered difficulties utilizing them in the extant Army technological infrastructure. The findings from this research will help guide and inform decision makers about pitfalls and advantages of utilizing mobile devices in the classroom.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA608384>

RR 1976

Examining Squad Capabilities at the Joint Readiness Training Center. (2014). Vowels, C.L., Dasse, M.N., Ginty, I.M., & Emmons, R.H. (DTIC No. ADB404975 / Restricted).

RR 1977

Transforming Warrant Officer Career College Instructor Assessment for the Army Learning Model. (2014). Nihill, M.M., & Stallings, G.M. (DTIC No. ADA611151).

This research involved transforming classroom and end-of-course (EOC) instructor performance metrics at the U.S. Army Warrant Officer Career College (WOCC) to reflect the Army Learning Model (ALM)'s emphasis on adult pedagogical approaches. An instructor guide was also developed to help instructors capitalize on the feedback provided by the metrics in order to enhance their ALM prescribed skills. The Academic Instructor Assessment (AIA) was developed and utilized to assess instructors of three WOCC courses. Fellow instructors and lead personnel utilized the AIA to conduct instructor evaluations and completed follow-up questionnaires regarding the AIA's usability and relevance to assessing ALM criteria. The supplemental EOC questionnaire was also implemented with students in three classrooms. Both the AIA and the supplemental EOC were well received. Restrictions in the sample and completion rates limited the psychometric properties calculable, but the AIA and EOC show promise as an

improvement to assess ALM properties. The AIA and EOC were revised to reflect personnel feedback. The AIA, EOC, and Instructor Guide were delivered and briefed to the WOCC lead personnel and Commandant. The AIA and EOC were preliminarily incorporated into the WOCC instructor evaluation process and the Instructor Guide was immediately incorporated into WOCC instructor preparation and training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA611151>

RR 1978

Soldier Perceptions of Sexual Harassment and Assault Response and Prevention. (2014). Willis, E.J. (DTIC No. ADB404939 /Restricted).

RR 1979

Designing Interactive Multimedia Instruction to Address Soldiers' Learning Needs. (2014). Blankenbeckler, P.N., Graves, T.R., & Wampler, R.L. (DTIC No. ADA616380).

This report is the second in a series of three, focusing on applying instructional design and tailored training techniques to address the Army Learning Model (ALM) point of need concept. The point of need concept focuses both on the accessibility of information to support the learning process as well as designing learning materials to address individual differences in learners experiences, background knowledge, and job-specific requirements. Here, we describe the process used and rationale for our approach to developing six IMI exemplars focused on point of need training, including three variations of needs-focused designs: familiarization, core, and tailored training. The IMI were developed for two topics Adjust Indirect Fire and Conduct a Defense by a Squad specifically targeting content to the needs of new squad or team leaders. We present our recommendations for developing needs-focused IMI for specific Army audiences. A previous report surveyed existing Army IMI for Combat Arms (Blankenbeckler, Graves, & Wampler, 2013); the final report in this series will present the findings of an experiment testing different IMI variations.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA616380>

RR 1980

Soldier Cognitive Processes: Supporting Teleoperated Ground Vehicle Operations. (2014). Catrambone, R., Lipinski, J.J., Ingurgio, V.J., & Wampler, R.L. (DTIC No. ADA616379).

Although small ground robotic vehicles provide great promise and benefit to units, there are challenges to overcome if the maximum benefit is to be gained from the introduction of these systems. The robots offer a host of capabilities. However, a person must know how to operate the system procedurally (e.g., use the hand controller buttons, know the menu options) and tactically (e.g., understand what the system can and cannot do). Learning how to operate and employ the ground robotic vehicle imposes a cognitive load on top of other military skills, perceptual decision-making skills, and communication skills that need to be utilized while operating the system. Therefore, trainers and leaders must understand what loads are placed on operators. The major issue is to understand how cognitive load impacts operators performance. Finally, training materials and approaches for operators, especially when the operators have diverse backgrounds and skills, must be designed and developed so operators can effectively and efficiently take advantage of the capabilities offered by the small ground robotic vehicles.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA616379>

RR 1981

An Alternative Front End Analysis Strategy for Complex Systems. (2014). Cobb, M.G., Brent, L.J., Buehner, T.M., Drzymala, N., & Nelson, J.J. (DTIC No. ADA616422).

This initial phase of a three phase research effort designs and recommends an alternative front end analysis (FEA) strategy for evolving, highly automated, complex systems that rely upon multilevel command and control integration. This research is in response to growing concerns that current task-based FEA processes are increasingly insufficient to identify performance and training requirements for complex, highly automated systems. Analytic strategies were identified by examining existing literature pertaining to air defense training and performance, FEA approaches, and complex task performance and training. Two alternative FEA strategies were developed, leveraging known issues and research findings. The approach recommended to the U.S. Army Air Defense School incorporates expertise-based and collective team analyses into the Army's established task-based FEA approach. This approach was approved by the Air Defense School for the next phase of this research, i.e. applying the strategy to current Patriot missile training. Given the scope and depth of Patriot missile training, this assessment will be limited to air battle management training. The results from this case use application will be

presented in a separate report following completion of the second phase of this research.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA616422>

RR 1982

Evaluation of Courses of Fire for Law Enforcement Firearms Training. (2014). Schaefer, P.S., Bruce, L., & Lipinski, J.J. (DTIC No. ADA616378).

In response to active shooter threats, the U.S. Army Military Police School (USAMPS) identified current best practices for weapons skills training as employed by various civilian and military law enforcement authorities. That information was then used to construct a new set of pistol training exercises which focus on dynamic shooting engagements and the development of skills like smooth weapons handling, successful target transitioning, and rapid weapon reloading. To identify an effective, efficient approach for training these skills, Active and Reserve Military Police (MPs) were trained on a common set of pistol exercises in either a Dry, Engagement Skills Trainer 2000 (EST 2000), Live, or Live Plus (i.e., identical to the Live condition but with additional practice rounds). Baseline (i.e., pre-training) and post-training shooting performance was measured. Results indicated that the Dry and Live Plus conditions were consistently the most effective at improving MP performance.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA616378>

RR 1983

Developing Performance Measures for Manned-Unmanned Teaming Skills. (2015). Stewart, J.E., Bink, M.L., Dean, C., & Zeidman, T. (DTIC No. ADA614047).

Manned-unmanned teaming (MUM-T) combines armed helicopters and unmanned aircraft system (UAS) in integrated tactical teams. Previous research identified critical skills required for successful MUM-T that many UAS operators lacked the training to execute. The current research effort was intended to develop performance measures for training-critical MUM-T skills that can support effective training. The refined performance measures were developed through interviews with senior UAS operators and at workshops consisting of scout-attack pilots and UAS operators with MUM-T experience. The product was 36 behavior-based measures that indicated good, average, and poor performance on MUM-T skills. The majority of measures (i.e., 26) were determined to have high validity and high utility, and only two measures were determined to have low validity and low utility. The measure determined to have low utility may reflect uncertainty as to the current role of UAS aircrews in MUM-T operations. The MUM-T measures can be used to effectively assess training outcomes in live training and virtual training.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA614047>

RR 1984

Patriot Training: Application of an Alternative Front End Analysis. (2015). Buehner, T.M., Drzymala, N., Brent, L.J., Cobb, M.G., Nelson, J.J. (DTIC No. ADB410869 / Restricted).

RR 1985

Application of an Alternative Front End Analysis: The Army Integrated Air and Missile Defense Fire Control Element. (2015). Drzymala, N., Buehner, T.M., Brent, L.J., Cobb, M.G., & Nelson, J.J. (DTIC No. ADB410293 / Restricted).

RR 1986

Training Capability Data for Dismounted Soldier Training System. (2015). Bink, M.L., Ingurgio, V.J., James, D.R., & Miller, J.T. (DTIC No. ADA621959).

The U.S. Army recently fielded a dismounted infantry simulator to train small-unit tactical skills and to link small-unit simulation training with combined arms simulation. The Dismounted Soldier Training System (DSTS) is intended to enhance training, replicate battlefield conditions, balance resources, and sustain readiness. In order to determine the extent to which Dismounted Infantry simulation in general and DSTS in specific provides realistic and useful training, the U.S. Army conducted two performance-capabilities experiments in the summer and fall of 2012. The purpose of the current research was to document the training capabilities of DSTS at this point in time. The results across the two experiments could be classified as mixed at best. Performance capabilities were mostly classified as acceptable for training. However, there was a lower sense of operational realism and a lower sense of training preparation in DSTS compared to live training. The discrepancy in results emphasized the high level of familiarity required to obtain training benefit from DSTS. More than 8 hours of structured familiarization training were required before Soldiers were comfortable enough with DSTS to effectively execute

training. However, the DSTS after action review capabilities were universally perceived as providing a positive impact on training.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA621959>

Research Products

RP 2000-01

A Review and Annotated Bibliography of the Literature Pertaining to Team and Small Group Performance: 1989 — 1999. (1999). LaJoie, A.S., & Sterling, B.S. (DTIC No. ADA371864).

The military, along with private industry, is relying more on small teams of specialized individuals who work together to achieve a common goal. Examples of these teams include emergency medical teams, aircrews, decision-making teams, industrial project teams, Special Forces teams, weapon system crews and everyday work teams. Training and military doctrine has been evolving to reflect this emphasis on teamwork. The purpose of this annotated bibliography is to review literature published over the last ten years concerning team and small group performance. Specifically, the articles reviewed in this report represent a sampling of the research published in the social sciences, including psychology, sociology, and business. The team and small group literature reviewed includes examples of the many types of teams mentioned earlier. A summary and integration of this work is provided. In general, the research suggests that there are several components which contribute to the successful performance of teams, and that some of these components can be explicitly trained. Several training models are discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA371864>

RP 2001-01

Bradley Fighting Vehicle: Heat in the Driver's Compartment. (2001). Salter, M.S., & Eakin, D.E. (DTIC No. ADA389671).

This paper reports some preliminary efforts to document heat issues in the M2A3 Bradley Fighting Vehicle. This research compared surface and ambient temperatures throughout the driver compartments of the M2A3 and its predecessor, the M2A2 ODS (Operation Desert Storm) vehicle. Reports by Bradley Fighting Vehicle personnel had suggested that the M2A2 ODS was hot, but that the M2A3 was hotter. Results of this study supported these reports. Surface temperature measurements indicated that radiant heat through engine adjacent areas of the driver's compartment of the M2A3 produced extreme heat levels that were substantially hotter than the M2A2 ODS, although both models were found to have extremely high levels of heat in these areas. This study provided empirical evidence for a primary source of excessive heat within the M2A3 Bradley Fighting Vehicle driver's compartment. One of the possible engineering solutions to reduce heat in the driver's compartment suggested was implemented on a trial basis. Additional temperature readings on an insulated vehicle indicated that the insulation significantly reduced the heat coming from the engine area to the driver.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA389671>

RP 2001-02

Military Operations in Urban Terrain: Decision Making in Action. (2001). McDermott, P.L., Battaglia, D.A., Phillips, J., & Thordsen, M.L. (DTIC No. ADA391474).

Military Operations in Urban Terrain (MOUT) create unique cognitive demands for small unit leaders. Years of experience are typically needed to master these demands. However, most platoon leaders tend to have limited experience in Army operations generally, and in MOUT specifically. Developed from in-depth interviews with veterans having MOUT combat experience, this report provides a comprehensive and detailed overview of the decisions platoon leaders must make during five stages of building clearing: secure perimeter, approach building, enter building, clear building and maintain security, and evacuate building. The report also discusses five general skills that are required throughout building clearing missions: think like the enemy, maintain situational awareness and the big picture, project into the future, apply rules of engagement, and lead subordinates.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA391474>

RP 2001-03

Application of Cognitive Principles in Distributed Computer Based Training. (2001). Deatz, R.C., & Campbell, C.H. (DTIC No. ADA392929).

As the U.S. Army continues to develop more powerful and complex digital information systems, it is essential that both training needs and training opportunities are addressed to meet mission objectives. One way to address the training challenges of emerging digital systems is through the use of computer-based instruction (CBI), particularly because of the flexibility it offers in the way training can be delivered (e.g., embedded, distance learning, Internet). Another way is to improve learning by applying

principles of cognitive psychology to the training design. This paper describes a research and development effort that incorporated a limited set of cognitive learning principles and techniques in the design of CBI for individual digital operator skills. To demonstrate the design features, four prototype training modules were developed for the Force XXI Battle Command Brigade and Below (FBCB2), the Army's vehicle-mounted digital system for distributing information to provide situational awareness. This paper describes how the selected instructional techniques and cognitive principles were used in distributed computer-based training. Pictures of screen layouts illustrate how the principles and techniques were instantiated in operator training for a digital system. Finally, this report provides a discussion of the lessons learned and issues for future research and development.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA392929>

RP 2002-01 — Replaced by RN 2003-09

RP 2002-02

Think Like a Commander: Captain's Edition (2002). Shadrick, S.B., & Lussier, J.W. (DTIC No. ADM201478 / CD-ROM).

Think Like A Commander: Captain's Edition – Prototype 1.0 was implemented in the Armor Captain's Career Course at Fort Knox, KY in 2002. This CD-ROM contains the installation program needed to use the Think like a Commander (TLAC) software application. Think Like a Commander was developed to support the Adaptive Thinking Training Methodology and is grounded in sound learning practices designed to support the use of deliberate practice principles. The aim of TLAC is to maximize the development of commanding officers thinking skills, teaching officers "how to think" instead of "what to think." This will enable the officer to make sound decisions when the situation deviates from the expected and the ability to think adaptively is required, particularly when limited time is available to make a decision and when under extreme pressure and/or stress.

RP 2003-01

Multi-Compo Tool Kit: Information to Help Leaders Meet the Challenges of Active and Reserve Component Integration. (2002). Taylor, T.Z., Hagman, J.D., Lockaby, K.J., Randolph, P., Caster, B., & Leibrecht, B.C. (DTIC No. ADM001465 / CD-ROM).

This product is a web-interactive, compact disc (CD)-based tool kit containing U.S. Army Reserve (USAR) related information included to help leaders, at corps through company level, meet the challenges of Active/Reserve Component (AC/RC) integration within a multiple-component (multi-compo) unit environment. The tool kit contains six sections of need-to-know information: (a) A multi-compo handbook to help leaders get to know the operational environment of the USAR and to serve as a foundation for establishing standing operating procedures for multi-compo units, (2) tips for achieving successful integration that address the causes, effects, and recommended solutions to problems that may occur in a multi-compo environment in the areas of command climate, personnel, training, logistics, and finance/funding, (3) sponsorship checklists for ensuring the seamless transition of USAR Soldiers newly assigned to multi-compo units, (4) mobilization information to help multi-compo unit leaders during each phase of the mobilization process, (5) links to supporting organizations, and (6) a list of sources used to support tool kit development.

RP 2003-02

Think Like a Commander: Instructor's Guide to Adaptive Thinking. (2003). Lussier, J.W., Shadrick, S.B., & Prevou, M.I. (DTIC No. ADA413046).

This report is the second of two research products presenting the methods and software for training adaptive battlefield thinking. The first research product presented the prototype software training application. This report is an instructor's guide that provides an overview of adaptive battlefield thinking skills and documents the methods for employing the software application and administering the training. The report provides an introduction to adaptive thinking and the Adaptive Thinking Training Methodology and details the use of deliberate practice in training cognitive skills. Detailed information about the prototype vignettes are presented with comprehensive instructor materials needed to implement the training.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA413046>

RP 2003-03 — Cancelled

RP 2003-04

Research Observations and Lessons Learned for the Future Combat Systems. (2003). Campbell, C.H., Throne, M.H., Black, B.A., & Lickteig, C.W. (DTIC No. ADA415812).

This brief summarizes some of the important observations and lessons learned from training research and development conducted by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) over the past 15 years. Its purpose is to assist Future Combat Systems (FCS) designers and developers as they formulate plans for the systems and for the training that will accompany the systems. The topic summaries cover the need for a Master Training Plan, training development and implementation concerns, training and performance support and system issues, and a few non-training and non-system observations. The reference list (Appendix B) gives the complete citation for readers who need more information, and the reference matrix at Appendix C shows which documentation sources each topic summary is based on. In selected cases, more complete summaries on specific techniques or principles are provided in Appendix D. Finally, Appendix E contains a compendium of research issues that remain to be investigated.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415812>

RP 2003-05

A Practical Guide for Exploiting FBCB2 Capabilities. (2003). Leibrecht, B.C., Lockaby, K.J., & Meliza, L.L. (DTIC No. ADA415997).

This document provides two products developed to support performance feedback regarding unit employment of the platform-based digital command, control, and communication system known as Force XXI Battle Command Brigade and Below (FBCB2). The Leader's Primer for Exploiting FBCB2 describes twenty-two major FBCB2 capabilities, the tactical significance of each capability, the digital operator and user tasks involved in employing each capability, the probability that the capability is being exploited, and the evidence that the capability is not being exploited. The FBCB2 Exploitation Tool identifies fifty digital performance goals and the tactical significance of each goal. The tool identifies the echelon(s) to which each goal applies, the trigger events that call for observation of unit performance relevant to the goal, and guidance regarding where to obtain the data needed to assess unit performance. Data are obtained by using one or more of the following mechanisms: observing information on an FBCB2 system: viewing breakouts of message traffic; viewing breakouts of user interactions with systems; and asking questions of warfighters.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415997>

RP 2003-06

Combat Leaders' Guide Leader Handbook. (2004). Salter, M.S., & Centric, J.H. (DTIC No. ADA420746).

The history of the initial Combat Leaders' Guide (CLG) project began in 1985 and continues to the 2003 reprint of the CLG. The CLG is a pocket-sized job performance aid, useful to any Soldier. The CLG product provides a trained leader with the steps required to perform many common leader tasks in a quick reference, easy to read format. More than 50,000 CLGs have been distributed to Soldiers for use at home station, during deployments, and for use in field exercises, unit evaluations, and at each of the Combat Training Centers. The CLG has gone on stability and support operations, and has gone to war with Soldiers. Users have been supportive of and responsive to the CLG as evidenced by the continuing individual and unit requests received by ARI.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA420746>

RP 2004-01

Think Like a Commander — Excellence in Leadership: Educating Army Leaders with the Power Hungry Film. (2004). Zbylut, M.L., & Ward, J.N. (DTIC No. ADA422791).

This instructor's guide is the first of two research products that describe how to use Think like a Commander-Excellence in Leadership (TLAC-XL) in an instructional setting. This guide describes how instructors can use the film from TLAC-XL as a case study to facilitate discussion on various leadership topics, particularly those that pertain to creating effective interpersonal relationships. Instructors may find this training tool highly relevant for Captains, Lieutenants, and junior noncommissioned officers (NCOs) expected to engage in stability and support operations (SASO) in the Middle East. This guide provides an analysis and hard copy of the case study; discusses the teaching themes embedded in the case study; presents tips for promoting effective discussion; and offers lesson objectives, discussion

questions and answers, and an overview of the case study as an instructional vehicle. Information about how to obtain the case study and technical requirements is included in the document.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA422791>

RP 2004-02

Feedback to Improve Team Training Vignette Technology for Future Command / Staff Teams.

(2004). Bernhagen, R.P., Wilson, B.E., Wray, R.E., Leibrecht, B.C., & Karrasch, A.I. (DTIC No. ADM201823 / CD-ROM / Restricted).

RP 2004-03

User Manual for the Dismounted Virtual After Action Review System. (2004). Clark, B.R., Lampton, D.R., Martin, G.A., & Bliss, J.P. (DTIC No. ADA425427).

This product includes the operator's manual for the Dismounted Infantry Virtual After Action Review System (DIVAARS). The 16-page manual provides complete instructions for the installation and use of the DIVAARS software. Along with the manual, a description is presented of why and how the manual was developed, including a detailed account of usability testing. Information about obtaining the DIVAARS software is included. DIVAARS can function as the After Action Review system for any exercise conducted with Distributed Interactive Simulation (DIS) compliant systems. Examples of DIS systems are: the Squad Synthetic Environment (SSE), Virtual Emergency Response Training System (VERTS), and the Fully Immersive Team Training (FITT) system. DIVAARS is especially useful for training small teams that operate on foot (versus from within vehicles) and in urban areas (including operations inside of buildings). DIVAARS requires a dual Pentium III, 1.0GHz PC (or single equivalent processor, e.g., Pentium 4, 2.0GHz), 512MB RAM, 40GB drive, and a hardware-accelerated video card (e.g. nVidia GeForce 4). DIVAARS runs on Red Hat Linux (version 8.0 or 9). Other software requirements (freeware via World Wide Web) include the Virtual Environment Software Sandbox 3.0.0, Open Scene Graph 0.9.6, and OpenAL.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA425427>

RP 2004-04

A Scenario Generation Package for Assessing and Training Leader Skills. (2004). Wampler, R.L., Blankenbeckler, P.N., & Dlubac, M.D. (DTIC No. ADA426014).

This report documents the development of a scenario tool set with variable factors that can be used to assess or train leader skills as the Army transitions to the Future Force. The components of the tool set can be tailored to produce 45 basic scenarios. Each scenario can be altered by injecting events to create more exercise conditions. All source documents needed for leader planning are available, to include supplemental map boards; each can be modified to conform to the desired exercise requirements. A user's manual containing a step-by-step guide and a specific example of how to use the scenario tool set is available to assist evaluators and trainers. Use of these scenarios requires advanced planning to select the modules, components, and incidents to create the desired situation. The scenarios and resulting exercise vignettes, administered in a constructive or virtual simulation, will provide a realistic representation of expected battlefield events to allow leader skills to be assessed or trained. The scenario tool set can be used to train leader skills or research the impact on leaders of changes in organizations or technological capabilities. It can also be used for generating standardized scenarios for analysis purposes.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA426014>

RP 2004-05

Think Like a Commander: Mission to Azerbaijan – Student Materials. (2004). Heiden, C.G., Shadrack, S.B., & Davies, A.G. (DTIC No. ADM201768 CD-ROM / Restricted).

RP 2004-06

Think Like a Commander: Mission to Azerbaijan – Instructor Materials. (2004). Shadrack, S.B. (DTIC No. ADM201767 / CD-ROM / Restricted).

RP 2005-01

Symposium on PC-Based Simulations and Gaming for Military Training. (2004). Belanich, J., Mullin, L.N., & Dressel, J.D. (DTIC No. ADA430826).

In 2003, the Advanced Training Methods Research Unit of the U.S. Army Research Institute for the Behavioral and Social Sciences held a two-day symposium on DoD's use of training games. The 50

participants in attendance listened to presentations on the use of games for training purposes from the three military services, academia, and private sector representatives. Each presentation was followed by a discussion on the use of PC-based simulations and games for military training. Topics included the effective use of training games, their integration into courses, barriers to implementation, return on investment, and evaluating training effectiveness. A key finding highlighted in several presentations was that the few training games in use work best when closely monitored by instructors or subject matter experts and are integrated with existing courses and their specific objectives. Another recurring theme was that the more effective training games require developers, subject matter experts, instructors, and evaluators to work together through the entire development process. Participant feedback indicated that the symposium was very timely and filled a continuing need in a growing, rapidly changing community. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA430826>

RP 2005-02

Train-the-Trainer Package for the Full Spectrum Warrior Game. (2004). Centric, J.H., Beal, S.A., & Christ, R.E. (DTIC No. ADA428443).

Full Spectrum Warrior (FSW), built for use with Microsoft's X-Box game console system, and was developed to provide Infantry squad leaders with the opportunity to practice making tactical decisions and executing the troop-leading procedures that are required for urban operations. The U.S. Army Research Institute for the Behavioral and Social Sciences, Infantry Forces Research Unit (IFRU) at Fort Benning, Georgia, was asked to help in evaluating the training effectiveness of FSW. During the process of evaluation, the IFRU teamed with Northrop Grumman Mission Systems to create this Train-the-Trainer package that would help Army trainers learn to play FSW, help them teach their Soldiers how to play and learn tactical decision. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA428443>

RP 2005-03

Future Focused Training Exercises with Alternative Coaching Conditions. (2005). Kiser, R.D., Childs, J.M., Leibrecht, B.C., & Lockaby, K.J. (DTIC No. ADM001752 / CD-ROM).

As it transforms to the Future Force, the Army faces challenges in conducting effective training for network-centric, distributed operations. This product presents the results of a research effort to advance the methodology for training companies and platoons, particularly in regard to the provision of coaching, in the future training environment. It primarily describes a prototype training support package designed for vignette exercises. It also discusses key training management issues for distributed exercises using digital collaborative capabilities. Finally, the product includes an experimentation concept developed to support research on Future Force coaching conditions. The product establishes a foundation for investigating key dimensions of future training programs, with emphasis on coaching and feedback conditions.

RP 2005-04

Future Job Clusters. (2005). (DTIC No. ADA432029).

Transformation of the U.S. Army into the Future Force involves changes to missions, systems, and organizational structures. To realize the full potential of transformation, the Army must have the means to select and to assign high quality individuals who, as first-term Soldiers, can meet the training and operational demands emerging with transformation to the Future Force. This report is part of a series of research product reports that provide to potential users information on products resulting from a project titled New Predictors for Selecting and Assigning Future Army Soldiers (Select21). The goal of Select21 is to (a) develop and validate new performance predictor measures and (b) propose use of the most promising measures as a foundation for an entry-level selection and classification system adapted to the demands of the 21st century. The present report describes 16 clusters of jobs that were constructed to cover the domain of Army jobs in the period 2015-2020 and to provide a framework for the Select21 research. The clusters were constructed for research purposes from future-oriented job information, and they are not advanced as a new structure for classification of Army jobs. Regardless, the clusters provide a potentially useful approach for considering the occupational functions of future Soldiers. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA432029>

RP 2005-05

Future Army Wide Soldier Performance Requirements. (2005). (DTIC No. ADA432475).

Transformation of the U.S. Army into the Future Force involves changes to missions, systems, and organizational structures. To realize the full potential of transformation, the Army must have the means to select and to assign high quality individuals who, as first-term Soldiers, can meet the training and operational demands emerging with transformation to the Future Force. This report is part of a series of research product reports that provide potential users' information on products resulting from a project titled New Predictors for Selecting and Assigning Future Army Soldiers (Select21). The goal of Select21 is to (a) develop and validate new performance predictor measures and (b) propose use of the most promising measures as a foundation for an entry-level selection and classification system adapted to the demands of the 21st century. The present report describes the predicted job performance requirements of all future entry-level Army jobs, regardless of Military Occupational Specialty. These future performance requirements are characterized in three complementary ways: first, in terms of future anticipated conditions (e.g., increased pace); second, in terms of performance dimensions (e.g., communication, teamwork); and third, in terms of the specific tasks Soldiers need to be able to perform. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA432475>

RP 2005-06

Joint Focused Command / Staff Training Vignettes for the Future Force. (2005). Wilson, B.E., Leibrecht, B.C., & Karrasch, A.I. (DTIC No. ADM001822 / DVD).

The Army's transformation to the Future Force calls for innovative training methodologies to build high-performing distributed teams. Mobile command/staff teams in the Future Force Unit of Action (UA) will collaborate virtually by means of advanced battle command technologies. They will perform as members of Joint and multinational forces. The research vignettes presented in this product stem from efforts to explore training approaches for the distributed environment of the future. The basic set of short-duration battle staff exercises is designed to facilitate experimentation with Future Force concepts, doctrine, and procedures. The training support package includes a scenario with tactical materials plus guides for the staff participants and support personnel. The performance measures and feedback strategies are geared to the virtual collaborative environment. The product presents lessons learned for conducting distributed exercises with a UA battle staff. The products of the research establish a forward-thinking toolkit for investigating issues, approaches, and methods focused on training in the future operational environment.

RP 2005-07

Select²¹ Soldier Job Performance Measurement Tools. (2005). (DTIC No. ADA442664).

Transformation of the U.S. Army into the Future Force involves changes to missions, systems, and organizational structures. To realize the full potential of transformation, the Army must have the means to select and to assign high quality individuals who, as first-term Soldiers, can meet the training and operational demands emerging with transformation to the Future Force. This report is part of a series of research product reports that provide to potential users information on products resulting from a project titled New Predictors for Selecting and Assigning Future Army Soldiers (Select21). The goal of Select21 is to (a) develop and validate new performance predictor measures and (b) propose use of the most promising measures as a foundation for an entry-level selection and classification system adapted to the demands of the 21st century. This report describes the tools that will be used to measure the job performance and organizational "fit" of Soldiers participating in the Select21 research. Soldiers' scores on these performance measures will be linked to their scores on experimental pre-enlistment tests to determine how well the pre-enlistment tests might forecast future job performance. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA442664>

RP 2005-08

AH-64A Back Up Control System Familiarization Training: Instructor Pilot's Guide for the AH-64 Simulator. (2005). Couch, M., & Johnson, D.M. (DTIC No. ADA438309).

The AH-64A Apache helicopter contains an emergency fly-by-wire flight control system, called BUCS, that exists to back-up the mechanical flight control system in the event that this primary system becomes damaged or malfunctions. Aviators must be trained in the operation of this back up control system. This BUCS familiarization training must take place in a simulator, since it is too dangerous and expensive to be performed in the aircraft. The ARI STRATA research simulator was enlisted to provide the platform for this training, as no other simulator in the Army inventory was capable, at the time, of

simulating the full range of BUCS flight procedures. ARI created a model BUCS training course. From 2001 through 2005, ARI provided simulator-based familiarization training to 978 AH-64A Army aviators. The current research report provides the program of instruction used to train these aviators. This method of instruction can be used with any AH-64A flight simulator that fully represents BUCS. It can be modified to support training of the AH-64D Longbow Apache.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA438309>

RP 2005-09

A Training Technology Evaluation Tool. (2005). Livingston, S.C., Dyer, J.L., & Swinson, D.N. (DTIC No. ADA438043).

A Training Technology Evaluation Tool was developed to help procurers and developers of training technologies to make informed decisions and to improve the overall effectiveness of training technologies. The tool provides estimates of training technology effectiveness, based on expert ratings. The overall ratings reflect the initial performance of the Soldiers to be trained on the tasks covered by the training technology, task and subtask characteristics, learning difficulty, and residual performance deficits after using the technology, physical and functional similarities to the operational environment/equipment, and training transfer. The questions in the tool are presented via an Excel program, whereby all mathematical calculations are automated and transparent to the user. The tool can be used at any stage of training technology design and implementation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA438043>

RP 2006-01

Select²¹ Experimental Selection and Classification Instruments. (2005). (DTIC No. ADA439891).

Transformation of the U.S. Army into the Future Force involves changes to missions, systems, and organizational structures. To realize the full potential of transformation, the Army must have the means to select and to assign high quality individuals who, as first-term Soldiers, can meet the training and operational demands emerging with transformation to the Future Force. This report is part of a series of research product reports that provide to potential users information on products resulting from a project titled New Predictors for Selecting and Assigning Future Army Soldiers (Select21). The goal of Select21 is to (a) develop and validate new performance predictor measures and (b) propose use of the most promising measures as a foundation for an entry-level selection and classification system adapted to the demands of the 21st century. This report describes the experimental selection and classification instruments. In the Select21 project, Soldiers' scores on these instruments will be linked to their scores on job performance measures to evaluate how well these instruments might forecast future job performance. Instruments that show promise for predicting job performance could supplement the Army's current selection and classification test battery (i.e., the ASVAB, the Armed Services Vocational Aptitude Battery) in the future.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA439891>

RP 2006-02

MEDALIST: Communication Drills for Distributed Coaching. (2005). Graves, C.R., Jenkins, S.N., Flynn, M.R., & Shadrack, S.B. (DTIC No. ADM001843 / CD-ROM).

In the Multi-Echelon Distributed Army Leaders' Information Support Training (MEDALIST) project, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) examined communication requirements essential to the conduct of battle command in the emerging operational environment and designed a flexible, scalable training approach for training those and related tasks in a distributed training environment. The MEDALIST approach comprises a notional structure of communication drills with varying difficulty levels and scenario settings, targeted training audiences, a distributed performance coaching model, and specifications for a PC-based system that supports delivery of the training. The effort examined the potential to apply the MEDALIST approach to the training of information support activities in the emerging Future Force and Stryker Brigade Combat Team environments. This product provides the training-support materials for the MEDALIST exercises. A companion ARI Research Report is available that describes the background, objectives, activities, products, and conclusions of the MEDALIST work.

RP 2006-03

Training Vignettes and Installation Guide for the Battle Captain Advanced Team Training: Training Support Packages. (2006). McElroy, W., Dodge, M., Davidson, G., & Kambe, G. (DTIC No. ADM001921 / CD-ROM).

This U.S. Army Research Institute Research Product was developed in conjunction with the Army Armor Center and School to address the requirement to train battle captains to work together as a team to accomplish collective tasks during the execution phase of missions. The training packages contained in the accompanying three compact disks (CDs) are designed to be instructorless, i.e., Instructors, Observer/Controllers are not required. However, implementation of the training does require installation of the software on four off-the-shelf networked desktop computers. An installation guide is provided on Server CD 1. Following installation, there is a self-paced tutorial which explains the concepts underlying the training approach and the tasks to be trained. All the road to war information and operations orders necessary to execute each of the forty vignettes is provided. A guided self-paced team performance review follows each vignette. Initial research has shown these training packages to be challenging and effective for a broad range of experienced battle captains and novices alike.

RP 2006-04

Captains in Command. (2006). Wilson, B.E., Holder, L.D., Kiser, R.D., Fullen, T., Hobson, R., & Shadrack, S.B. (DTIC No. ADM202075 / DVD).

As it transforms to the Future Force, the Army faces challenges in training adaptive leaders for network-enabled, distributed operations. This product demonstrates the results of a research effort to advance the adaptive training methodology using instructorless coaching techniques to train Army captains as adaptive battlefield decision makers. It represents an instructorless prototype training support package designed for vignette-based exercises. Sophisticated 3D characters and environment were used to elaborate expert considerations after viewing tactical vignettes. The product establishes a training baseline for investigating key dimensions of instructorless training programs, with emphasis on coaching, adaptive thinking, and deliberate practice.

RP 2006-05

User's Guide for Tactical Thinking Behaviorally Anchored Rating Scales. (2006). Phillips, J., Ross, K.G., & Shadrack, S.B. (DTIC No. ADA452069).

An ongoing need exists in the Army to enhance combat leaders' tactical thinking skills. In conjunction, measurement techniques must be developed to assess tactical thinking skills. This product provides a user's guide for using the Tactical Thinking Behaviorally Anchored Rating Scales (T-BARS) to measure an individual's cognitive proficiency in tactical thinking. It describes the use of four scales that enable researchers to measure cognitive proficiency along critical dimensions of tactical thinking by coding behaviors that are observable in the context of training sessions, exercises, or experiments. Themes of tactical thinking identified in the Think like a Commander program formed the basis of T-BARS. The user's guide provides information on making assessments and establishing interrater reliability.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA452069>

RP 2006-06

Simulated Field Exercise Tool. (2006). Brockett, A.T., McDermott, P.L., & Warwick, W. (DTIC No. ADM202059 / CD-ROM / Restricted).

RP 2006-07

SimFX Player User Guide and Tutorial. (2006). Archer, R., Brockett, A.T., McDermott, P.L., & Warwick, W. (DTIC No. ADB321862 / Restricted).

RP 2006-08

SimFX Author User Guide and Tutorial. (2006). Archer, R., Brockett, A.T., McDermott, P.L., & Warwick, W. (DTIC No. ADB321870 / Restricted).

RP 2006-09

New Skills Training Plan for Map Functions and Passage of Lines on a Soldier System.

(2006). Blankenbeckler, P.N., Livingston, S.C., Dlubac, M.D., Riffe-Seckinger, N.C., Swinson, D.N., & Dyer, J.L. (DTIC No. ADA452855).

The training products in this report bridge the gaps between training digital and non-digital forces. The new skills plans present ways to teach digital skills associated with new computer-based technologies, but also relate these skills to current procedures and techniques used without these technologies. Consequently, these products help Soldiers learn and retain the new digital skills, and also to retain the associated non-digital skills required to perform the same tasks. The two tasks selected to serve, as the

prototypes for these training plans are map functions and the conduct of a passage of lines as the stationary unit. Map functions involve a series of individual skills and tasks. The passage of lines as a stationary unit is an amalgam of individual skills and tasks, and collective tasks, and as such is a collective task. This particular collective task focuses at platoon level and below. Included in the plans are a series of increasingly difficult exercises as well as assessment procedures.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA452855>

RP 2006-10 — Cancelled

RP 2006-11

Vignette Based Training for Junior Leader Teams: Operation Enduring Freedom. (2006). Bell, J.A., DeSario, G., McElroy, W., & Sanders, W.R. (DTIC No. ADM202062 / CD-ROM / Restricted).

RP 2006-12

Enhancing Warrior Ethos in Soldier Training: The Teamwork Development Course. (2006). Klein, G.E., Salter, M.S., Riccio, G.E., & Sullivan, R. (DTIC No. ADA457418).

The product described is the result of research that explored the concept and definition of Warrior Ethos, in an effort to facilitate its application for Soldiers during initial training and throughout their military careers. The Warrior Ethos tenets were divided into component attributes and behaviors; the product described here provides an example of a potential venue for Warrior Ethos training during the basic training program and includes train-the-trainer materials that help to identify Warrior-like behaviors. The venue is the Teamwork Development Course (TDC), an obstacle-like course conducted at all Basic Combat Training locations. Executed during the early weeks of training, the course encourages teamwork and the growth of problem-solving skills. The TDC references Army values and although the activities are difficult and challenging, they are not particularly stressful. The Warrior Ethos-based Training Support Package and its accompanying After Action Review behavioral checklist provide an expansion of the benefits of the TDC by identifying and reinforcing Warrior Ethos behavior.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA457418>

RP 2006-13

Training Support Package Determination Methodology. (2006). Krueger, R.A., & Olson, D.W. (DTIC No. ADM001900 / CD-ROM).

This Research Product describes a methodology for specifying needs for future training support packages. It includes a series of templates and associated questions to be completed and answered by training developers. Application of the methodology results in a list of training support packages, described in terms of the echelons and tasks to be trained. The methodology also results in prioritization of the training support packages to be produced.

RP 2007-01

Red Cape: Crisis Action Planning and Execution. (2006). Beaubien, J., Paley, M., Badugu, S., Shadrack, S.B., Ennis, C., & Jacklin, S. (DTIC No. ADM001908 / CD-ROM).

The Red Cape training product is the result of a collaborative research project by the U.S. Army Research Institute for the Behavioral and Social Sciences and the Indiana Army National Guard. The intent of the research was to develop training to improve emergency operations decision making, planning, and execution for Army National Guard and civil-military, interagency leaders. The training uses cognitive battle drills to apply deliberate practice training concepts to nine expert crisis management skills, such as keeping a focus on the mission priorities, seeing the big picture, and re-prioritizing as necessary. The Red Cape training involves the presentation of theme-based situations to train expert behaviors. The prototype system includes an initial set of 15 vignettes with expert solutions. The present research product provides the materials needed to implement the Red Cape training.

RP 2007-02

System to Help Implement and Empower Leader Decisions: An Advanced Tool for Soldier Automation Interaction Research. (2007). Barnett, J.S., Meliza, L.L., & Arntz, S.J. (DTIC No. ADB325165 / Restricted).

RP 2007-03

Army Excellence in Leadership: Educating Army Leaders with the Tripwire Film. (2007). Metcalf, K.A. & Zbylut, M.L. (DTIC No. ADA465830).

This research product contains an instructor's manual which describes how to use the Tripwire case study from the Army Excellence in Leadership (AXL) system within a traditional classroom setting. The manual is intended to help instructors prepare for classroom discussions of leadership challenges and issues embedded within the Tripwire scenario. Because the Tripwire scenario is built around junior leadership issues in Iraq, instructors may find the Tripwire lessons particularly relevant for junior officers who will deploy to the Middle East. However, instructors can tailor Tripwire lessons to suit a broader training audience. The manual contains a summary and hard copy of the Tripwire case study, a description of potential teaching objectives and related discussion questions, and guidance on how to facilitate an effective classroom discussion. An overview of the AXL.net system, technical requirements, and contact information for obtaining the case study is also provided.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA465830>

RP 2007-04

Red Cape: Crisis Response Training for National Guard and Interagency Teams. (2007). (DTIC No. ADM002052 / DVD).

The Red Cape training product is the result of a collaborative research project by the U.S. Army Research Institute for the Behavioral and Social Sciences and the Indiana National Guard. The intent of the research was to develop training to improve emergency operations decision-making, planning, and execution for Army National Guard and civil-military interagency leaders. The training uses cognitive battle drills to apply deliberate practice, theme-based training concepts to nine expert crisis management behaviors, such as keeping a focus on the mission priorities, seeing the big picture, and re-prioritizing as necessary. The Red Cape training involves the presentation of situations to train theme-based expert behaviors. The present research product provides the materials needed to implement the Red Cape training for National Guard, first responders, coordinating agencies, and supporting agencies.

RP 2007-05

Exemplar Training for Battalion Visualization. (2007). McElroy, W., Bell, J.A., Shadrack, S.B., Leedom, D.K., Pokorny, R.A., & Haynes, J.A. (DTIC No. ADM002045 / CD-ROM).

This research product documents a proof of principle package used to train battlefield visualization skills at the battalion level. The training is a result of a cognitive task analysis to identify important visualization skill at a battalion level of command. The cognitive task analysis consisted of a review of current U.S. Army doctrinal literature, a review of visualization from a psychological perspective, and a series of interviews with military officers having recent experience in either a command position or as a battalion Operations and Training Officer (S-3) or Executive Officer (XO). Based on findings from the cognitive task analysis, 11 skill areas were identified as potential focal points of future training development. The findings from the cognitive task analysis were used to design and develop exemplar training exercises for two skill areas; identify key problem elements employing the principles of METT-TC and Elements of Operational Design and discover/exploit newly revealed problem elements to expand the visualization. This product provides an introduction to the battlefield visualization process, describes individual skill areas, and provides six example training manuals.

RP 2007-06

Battle Command Visualization 101: A Near Term Approach to Embedded Training. (2007). Fisher, J.M., Heiden, C.G., Gossman, J.R., Campbell, C.H., Generalao, T., Breidenbach, M.G., Lickteig, C.W., & Leras, B.M. (DTIC No. ADM002025 / CD-ROM).

This product illustrates a new approach to training that complements the Army's ongoing embedded training (ET) efforts and provides realistic training solutions for the current Force wherever deployed. The approach combines training theory and technology in a way that counters the usually inverse relationship between training fidelity and availability. The Battle Command Visualization (BCV) 101 product focuses on training conceptual skills needed by small unit command groups to see the battlefield with unmanned and networked sensors. The approach advances the potential of Interactive Multimedia Instruction (IMI) by providing pre-recorded, high-fidelity source materials for anytime and anywhere delivery. The training begins with expert demonstrations on how to employ sensors using a command and control system that provides automated feedback from virtual simulation. The training advances to participants performing similar exercises while receiving automated feedback from a training expert and virtual simulation. A learning management system guides the training and participant progress through gated exercises and quizzes modeled on the Conduct of Fire Trainer (COFT). The

product also documents lessons learned on combining training theory and technology in order to support training developers, system developers, and decision makers in future Army training efforts.

RP 2008-01

A U. S. Army Reserve Noncommissioned Officer Tacit Knowledge Inventory: Flexible Structure for Squad Level Leader Self Development. (2008). Taylor, T.Z., Higley, L., & Grabarczyk, D. (DTIC No. ADA483162).

Because the development of adaptive leaders is a top priority for the U.S. Army, the Army continuously seeks ways to improve its leader development programs. One way is by sponsoring research programs aimed at finding strategies to enhance leader competencies by examining the degree to which knowledge, particularly tacit knowledge (TK), contributes to a leader's effectiveness. TK is informal knowledge (not taught in institutions), accrued during the experience of operational assignments, and contributes to an individual's ability to problem-solve (e.g., how a leader establishes credibility upon assignment as a new leader). Improved problem-solving directly supports the Army's goal of growing adaptive leaders. Research suggests that TK levels reflect the culture of an organization through a shared mental model of how leader problems are solved. Thus far, the focus of TK research has been on identifying and mapping it among active Army officers at three leader levels, as well as measuring its relation to other leader competencies. The goal of this project is to identify and map TK among USAR Squad Level NCOs, and develop an inventory of this knowledge for use as a leader self-development tool. This research report summarizes the process by which the USAR NCO TK Inventory was developed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA483162>

RP 2008-02

After Action Review Tools for Dismounted Soldier Systems. (2008). Blankenbeckler, P.N., Wampler, R.L., Dlubac, M.D., & Dyer, J.L. (DTIC No. ADA483160).

This research examined tools and capabilities required to implement an embedded training (ET) after action review (AAR) support system in future dismounted Soldier systems to enhance the training of squads and platoons (small combat units). Dismounted Soldier systems are being designed and developed to increase battle command, situational awareness and understanding, and provide embedded training for the small unit. The context of the research was tools to assist the leader/trainer in conducting small-unit AARs. The effort examined projected system design requirements; AAR systems and capabilities employed at combat training centers and in virtual simulations; and AAR concepts and solutions explored during the Future Force Warrior Advanced Technology Demonstration. The analytic findings provide concepts for interactive system controls integrated into menus to facilitate the AAR process. The findings also provide tools to facilitate the integration of realistic firing engagements and casualty play during training. A suite of flexible tools was recommended which addresses the AAR ET requirement for the Ground Soldier System.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA483160>

RP 2009-01

Social Awareness and Influence Workshop Materials. (2009). (DTIC No. ADM002185 / CD-ROM).

The purpose of the Social Awareness and Influence Workshop is to help improve the ability of participants to influence others. While participants are likely to know about influence already from their experience as Army leaders, this course is designed to provide participants with some additional tools, techniques, and different ways of thinking about the topic of influence in order to refine and focus skills necessary for effective influence attempts. Influence is a core component of effective Army leadership and as such it is important to continually improve one's skills related to influence in order to be a more effective leader. In support of this goal, this work- shop consists of a PowerPoint presentation accompanied by numerous practical exercises including role plays and a video based situational judgment test. This workshop covers a wide range of topics related to influence including bases of power, various influence tactics, factors to consider in selecting an influence tactic, and a model of social awareness and influence that outlines how one can most effectively proceed through the phases of an influence attempt.

RP 2009-02

Garrison Commander Course: Crisis Action Decision Making. (2009). (DTIC No. ADM202761 / CD-ROM / Restricted).

RP 2009-03

Peer-to-Peer Training Facilitator's Guide. (2009). Costanza, M.N., Leibrecht, B.C., Cooper, W., & Sanders, W.R. (DTIC No. ADA502277).

The peer-to-peer (P2P) training approach involves small groups of people from similar social groupings, who are not professional teachers, helping each other to learn. The P2P approach has great potential for rapidly identifying emerging lessons learned and integrating these into wide-reaching Army training. However, to ensure that the potential of P2P training is realized, the Army needs to identify the instructional principles and best practices supporting effective P2P training and incorporate these into a Soldier-friendly facilitator's guide. The present research resulted in the development of a P2P Training Facilitator's Guide which incorporates best practices in P2P training from academia, industry, and the military. As part of the research process, the guide was reviewed during formative evaluation and revised. This report contains a brief overview of the project and the complete P2P Training Facilitator's Guide.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA502277>

RP 2009-04

Metrics for Assessing Cognitive Skills in the Maneuver Captains' Career Course. (2009). Leibrecht, B.C., Tucker, J.S., Haverty, R.B., Blankenbeckler, P.N., & Green, C. (DTIC No. ADA495761).

This report presents the products of research conducted to create student assessment metrics for the Maneuver Captains Career Course–Reserve Component (MC3-RC). Two Student Assessment Packages (SAPs) were developed, one for company command competencies and one for battalion staff competencies. This report describes the contents, organization, and special features of both SAPs. It also discusses guidelines for using the metrics to meet research, instructional, and programmatic goals and offers recommendations for disseminating and leveraging the products. Both SAPs are included in their entirety as appendixes. They support MC3-RC instructors in developing testing activities, tracking student progress, and providing grounded feedback to augment the learning process. The SAPs are currently being used to provide feedback to course proponents at Ft. Knox, KY, regarding the cognitive skill proficiency levels of the Captains in the courses.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA495761>

RP 2009-05

Methodology for Evaluating Transfer of Learning from the U.S. Army's Advanced Leaders Course. (2009). Leibrecht, B.C., Wampler, R.L., & Pleban, R.J. (DTIC No. ADA501599).

The research reported here established the foundation for a unit-focused evaluation of the new Infantry Advanced Leaders Course (ALC, formerly known as the Basic Noncommissioned Officer Course), with the emphasis on transfer of training. The work produced an Evaluation Design Plan, a Data Collection and Management Plan, measures of ALC impact, the architecture for data collection instruments, and a Data Collector's Guide. This document describes and characterizes each product, and presents intermediate products involved in developing the impact measures. It also summarizes design options considered and rejected, and delineates assumptions behind the data collection strategy. The primary products are included in appendixes. The research paves the way for a comprehensive evaluation of Infantry ALC's operational impact.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA501599>

RP 2009-06

Internet Delivery of Captains in Command Training. (2009). (DTIC No. ADM202762 / DVD / Restricted).

RP 2009-07

Annotated Bibliography of the Army Research Institute's Training Research Supporting the Land Warrior and Ground Soldier Systems (1998 – 2009). (2009). Dyer, J.L. (DTIC No. ADA508002).

This report summarizes a body of research and analyses conducted by the Army Research Institute at Fort Benning Georgia between 1998 and 2009 on the Land Warrior (LW) system and the Ground Soldier System (GSS). These Soldier systems include a wearable computer, global positioning system, and a communication system all linked to a network. Some references in the annotated bibliography are published ARI reports; others are special reports submitted to the TRADOC Capabilities Manager (TCM)-Soldier, Project Manager (PM) Land Warrior/Soldier and/or Army Infantry School (USAIS). Collectively, they provide a picture of LW training and system changes since 1998, summarize additional

ARI research generated by training issues and questions associated with Soldier systems such as LW and GSS, and summarize the short-term and longer-term impacts of the research.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA508002>

RP 2009-08 — Cancelled

RP 2009-09

Garrison Commander Vignettes: Facilitator's Guide. (2009). (DTIC No. ADB353810 / Restricted).

RP 2009-10

Developing Adaptive Training in the Classroom. (2009). Mueller-Hanson, R.A., Wisecarver, M.M., Dorsey, D.W., Ferro, G.A., & Mendeni, K.G. (DTIC No. ADA507620).

The need for self-aware and adaptive leaders in the Army has been widely documented; however, the study of adaptability and how it is developed is still relatively new. This product provides end users with information about what it means to be adaptive, how to identify adaptive performance training needs, how to develop and evaluate adaptability training for a classroom setting, and factors to consider beyond the classroom. It provides usable tools and guidance for each of these steps, including a sample course outline, sample evaluation tools, and a planning guide for self-development. Individual characteristics that may predispose one to act in an adaptable way are also discussed.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507620>

RP 2009-11

Validating Future Force Performance Measures (Army Class): Reclassification Test and Criterion Development. (2009). Moriarty, K.O., Campbell, R.C., Heffner, T.S., & Knapp, D.J. (DTIC No. ADA507668).

To meet the challenges facing the Army, the Army needs predictor measures that will enhance entry-level Soldier selection and classification. One of the purposes of the Army Research Institute for Behavioral and Social Sciences' (ARI's) Army Class project is to provide the Army with recommendations on which predictor measures, in particular measures of non-cognitive attributes (e.g., interests, values, and particular temperament), demonstrate the greatest potential to inform entry-level Soldier selection and classification decisions. The present report documents the development of criterion measures to assist in these analyses. A second purpose of the Army Class project is to develop and pilot job knowledge tests (JKTs) that can be used to aid reclassification decisions. If Soldiers are shown to possess critical knowledge, skills, and attributes (KSAs) for their new jobs, this could reduce training requirements and increase force readiness. This report documents the development of reclassification JKT test items.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507668>

RP 2010-01

Pilot Results – The use of real-time preference measurement technology to support the retention of enlisted personnel. (2010). Bloss, B., Keil, S., & Rotstan, K. (DTIC No. ADA517491).

This report describes a pilot project designed to demonstrate the feasibility of real-time preference measurement in a military personnel setting, specifically the preferences of enlisted Soldiers for re-enlistment incentive. TrueChoice Solutions (TCS) found the Defense Technical Information Center (DTIC) willing and able to host their preference measurement technology application. The Soldiers surveyed were in their first or second term and within 24 months of expiration of term of service (ETS). Response rates to the survey invitations were low (as expected), but completion rates of those who played the TCS "game" were very high. Illustrative preference measurement results from the TCS Dashboard – online analytics – are presented.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA517491>

RP 2010-02

Achieving Adaptability through Inquiry Based Learning. (2010). Duffy, T.M., & Raymer, P. (DTIC No. ADA523892).

This report presents inquiry based learning (IBL) as an instructional strategy addressing the Army's need for training flexible and adaptive leaders. Distinguishing tenets of IBL are characterized in contrast to the Army's current direct instruction strategy. Elements of IBL, including characterization of the orienting problem, learner support by the instructor, and assessment of learner outcomes are outlined.

Considerations for developing an IBL curriculum are addressed, and details of an example of an Army IBL course of instruction are provided.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA523892>

RP 2010-03

Developing a Blended Learning Approach for Army Leader Planning. (2010). Tucker, J.S., Sidman, J., Geyer, A., Mizrahi, G., O'Driscoll, J., & Semmens, R.P. (DTIC No. ADA528755).

The objective of this research project was to develop a blended learning module that facilitates the integration of component knowledge into higher order leader concepts and skills. As the Army is transitioning many of its institutional courses to a blended learning curriculum, the Training and Doctrine Command (TRADOC) has called for ARI to demonstrate blended learning approaches in the development of course material. Thus, training content was identified within the Aviation Captains Career Course (AVC3) that would benefit from the use of blended learning techniques to further the acquisition of skills and knowledge. Specifically, the Tactical Decision Exercise (TDE)-Builder tool was developed to foster military planning skills with a particular focus on the topic of intelligence preparation of the battlefield (IPB). As there is limited time available in the course to ensure that the knowledge is acquired by all students, the tool provides students with the opportunity to practice conducting the IPB exercise at their own pace with the goal of reinforcing the knowledge and skills acquired during the course. The final tool and supporting documentation was transitioned to AVC3 instructors/trainers for use as a blended learning approach for the course. The software runs a stand-alone application that does not require administrative rights and does not require server or Internet access. This report documents the process that was used to develop the tool and provides an overview of how to employ the tool. The software is enclosed in this report and also can be obtained by contacting the U.S. Army Research Institute for the Behavioral & Social Sciences.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA528755>

RP 2010-04

Assessing Leader Cognitive Skills with Situational Judgment Tests: Construct Validity Results. (2010). Tucker, J.S., Gesselman, A.N., & Johnson, V. (DTIC No. ADA530102).

The objective of this research was to provide construct validity evidence for two situational judgment tests (SJTs) that were developed to evaluate the cognitive skills of experienced Army leaders in the Maneuver Captains Career Course. Specifically, the SJTs were developed to assess two different echelons of command – company command competencies and battalion staff competencies. Results from 138 officers (primarily Captains) demonstrated that the best fitting models for both SJTs were ones in which adaptive skill and task performance were separate constructs. These findings are useful for instructors in that they provide specific guidance regarding the modules that reflect performance in either adaptive or routine decision-making contexts. Further, feedback was highly favorable due to the scenario-based nature of the questions; students felt challenged by having to apply knowledge learned throughout the course. These findings indicate that a SJT may be a practical and valid method for assessing leader adaptive and decision-making skills, especially when the data will be used to compare performance across individuals.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA530102>

RP 2010-05

Advisor Influence Strategies: 10 Cross-Cultural Scenarios for Discussion and Self-Assessment (Instructor's Manual). (2010). Zbylut, M.L., Wisecarver, M.M., Foldes, H., & Schneider, R.J. (DTIC No. ADA531634).

Influencing individuals can be daunting when influence must occur across a cultural divide. This is precisely the situation in which security force advisors, combat advisor teams, and transition teams often find themselves—attempting to influence individuals from another culture who are not in their chain of command. This research product is an instructor's manual that contains scenarios and materials to help advisors learn more about the types of situations in which influence is necessary. The scenarios were drawn from real events told by returning advisors. This manual includes (1) a scenario-based self-assessment tool that prospective advisors can use to better understand their influence strategies, (2) student handouts to enable them to score their use of different influence tactics and the effectiveness of influence tactics, (3) a scoring and interpretation guide for nine types of influence tactics, such as rational persuasion and pressure, (4) a discussion guide that provides instructors with discussion questions for each scenario, and (5) a student handout describing the different types of influence tactics that appeared in the assessment tool. While scenarios are specific to advising host nation counterparts,

this manual may be useful for military instructors interested in teaching about cross-cultural influence more generally.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA531634>

RP 2011-01

Advisor Influence Strategies: 10 Cross-Cultural Scenarios for Self-Assessment and Reflection. (2010). Zbylut, M.L., Wisecarver, M.M., Foldes, H., & Schneider, R.J. (DTIC No. ADA534107).

Knowing and being able to use a variety of influence strategies can be important to military personnel who find their job requires them to interact with people outside of their chain of command. Influencing individuals outside the chain of command can be daunting when influence must occur across a cultural divide. This is often the situation in which security force advisors, combat advisor teams, and transition teams find themselves—attempting to influence individuals from another culture who are not in their chain of command. This book contains a self-assessment tool and reflection questions to assist individuals interested in learning more about the types of situations in which advisors find influence is necessary. The scenarios were drawn from real events told by returning advisors and include influence strategies found in Army Leadership Doctrine and the psychology and management literatures. While the situations depicted are specific to the advising mission, reviewing the situations may be useful to any military leader who anticipates that they will need to influence someone from another culture.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA534107>

RP 2011-02

Instructor's Peer-to-Peer Learning Guide for the Army Reconnaissance Course. (2010). Cooper, W., Leibrecht, B.C., & Lickteig, C.W. (DTIC No. ADA537884).

The Army Reconnaissance Course (ARC) at Fort Knox, Kentucky, has adopted peer-to-peer (P2P) learning methods as part of a transition to outcomes-based training. To help cadre expand their P2P training competencies, the Instructor's P2P Learning Guide for the ARC was developed to serve as a professional development and performance support tool. The guide incorporated principles and best practices of P2P training. The Guide underwent iterative review by course leaders and instructors during initial development. The guide was then field tested by the ARC cadre and revised based the feedback from two stages of evaluation. This document describes the contents, organization, and presentation style of the guide. It includes the complete guide along with suggestions for utilizing the educational materials, procedural guidelines, and job aids.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA537884>

RP 2011-03

A Model of Emotion Management for U.S. Army Leaders. (2010). Shipman, A., Friedrich, T.L., Vessey, W.B., Connelly, S., Day, E., Douglass, A., Schroeder, J., & Ruark, G.A. (DTIC No. ADA535214).

Emotion management may be particularly important for effective Army leadership in certain performance domains. In addition to typical leadership tasks such as providing performance feedback, resolving conflicts and team-building activities, Army leaders must perform in potentially volatile and high stress situations, handle life or death decisions, interact with individuals from a variety of cultures and backgrounds, and address issues related to living over-seas. These reflect some of the important performance contexts facing Army leaders in which emotions can play a significant part. This research proposes a model of emotion management intended to form the basis for training Army leaders. The model integrates several areas of emotion research, including emotional intelligence, emotion regulation, and emotion expression. Specified in this model are four key domains that could potentially be enhanced through training interventions, including 1) emotion knowledge, 2) emotion skills, 3) situational moderators, and 4) emotion relevant performance domains. The model also notes the importance of considering individual differences in developing emotions management training, as well as organizational support for this kind of training initiative. Propositions regarding components of this model are suggested to advance theoretical understanding of emotion management concepts, specify directions for future research and identify implications for training leaders in emotion management. Finally, existing training programs of emotion management skills are reviewed with respect to the content areas described in the model.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA535214>

RP 2011-04

Development of Training Themes for Joint, Interagency, Intergovernmental and Multinational Operations. (2011). Ross, K.G., Grome, A., Arrastia, M.C., Schaab, B.B., Ong, J.C., Spangler, D. (DTIC No. ADB367188 / Restricted)

RP 2011-05

Host-Nation Operations: Soldier Training on Governance Training Support Package. (2011). Conrad, T.M., Mulvaney, R., Hirzel, A., Stern, J., Aude, S.N, Tindall, L., & Fite, J.E. (DTIC No. ADA546285).

The Iraq and Afghanistan campaigns have taught the U.S. Army the importance of establishing and supporting local and national institutions in order to develop stability within the host-nation. As a result, Army leaders asked for governance training that will provide the knowledge, skills, and abilities that Soldiers at the unit level will need to carry out and support governance-related missions. This research product describes research and development efforts to address that critical need. The Host Nation Operations: Soldier Training on Governance (HOST-G) Training Support Package, which is contained in this product, can be utilized by leaders during training and when performing governance-related activities in theater. It contains multiple resources that can be used for understanding governance, to train specific activities, and assist with carrying out governance-related activities within the operational environment. The training and training materials were developed to be adaptive and applicable to any geographic region, country, or culture. In addition, the training can be used by leaders from platoon to brigade level. The training tools and job aids described here are available as two CDs in, "Host-Nation Operations: Soldier Training on Governance (Host-G) Training Tools and Job Aids," ARI Research Product 2011-06.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA546285>

RP 2011-06

Host-Nation Operations: Soldier Training on Governance Training Tools and Job Aids. (2011). Conrad, T.M., Mulvaney, R., Hirzel, A., Stern, J., Aude, S.N, Tindall, L., & Fite, J.E. (DTIC No. ADM002361 / CD-ROM).

The Iraq and Afghanistan campaigns have taught the U.S. Army the importance of establishing and supporting local and national institutions in order to develop stability within the host-nation. As a result, Army leaders asked for governance training that will provide the knowledge, skills, and abilities that Soldiers at the unit level will need to carry out and support governance-related missions. The Host-Nation Operations: Soldier Training on Governance (HOST-G) Training Support Package (Conrad et al., 2011) was developed to address that critical need. These CD-ROMs contain the following training tools and job aids meant to accompany the training support package: Computer-Based Training, Governance Activity List, Situational Training Exercise, LEGIT Assessment Tool, Annex to Continuity Books, Metrics Workbook, and a "Be on the Lookout" (BOLO) Worksheet. Full details on the development and intended use of these products can be found in the "Host-Nation Operations: Soldier Training on Governance (HOST-G) Training Support Package," ARI Research Product 2011-05. All of the products were designed for use with Microsoft Word, Microsoft Excel, common image viewers, and Adobe Reader, so that they can be easily accessed and modified to fit the needs of operational units.

RP 2011-07

Rifle Marksmanship Diagnostic and Training Guide. (2011). James, D.R., & Dyer, J.L. May 2011. (DTIC No. ADA544533).

A Rifle Marksmanship Diagnostic and Training Guide was developed to assist Army drill sergeants diagnose and train Soldiers in the Initial Entry Training (IET) environment. The guide was based on subject matter expert input from the Infantry One Station Unit Training (OSUT) Brigade and the U.S. Army Marksmanship Unit (USAMU). These experts were interviewed to obtain effective training and diagnostic techniques and lessons learned through years of training IET Soldiers. The guide integrates this information, sequences it according to the marksmanship program, and thoroughly illustrates the major training principles and lessons learned. All information supplements and complements the Army marksmanship field manual. The guide is an Appendix to the report.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA544533>

RP 2011-08

Soldiers' Toolbox for Developing Tactics, Techniques, and Procedures. (2011). Topolski, R., Leibrecht, B.C., Porter, T., Kiser, R.D., Green, C., & Crabb, B.T. (DTIC No. ADM002360 / CD-ROM).

The purpose of the Soldiers TTP Toolbox is to assist units and Soldiers in generating or revising tactics, techniques, and procedures (TTP). The TTP Toolbox provides a methodical, proven approach to TTP development or revision based upon an existing Flexible Method of Cognitive Task Analysis (FLEX) (Lussier, & Hinkle, 2005) further tested and refined during subsequent research (Topolski, Leibrecht, Kiser, Kirkley, & Crabb, 2009). The TTP development/revision process involves the use of tactical vignettes in various development/revision modes (i.e., environments) to drive discussion sessions from which the unit will capture and organize data relevant to TTP. Ideally, units should progress through three modes (MAPEX/table top, simulation, and live exercise) to increase realism and thereby improve accuracy, add detail, and boost confidence in the session outcome.

RP 2011-09

After Action Review Guide for Trainers of Virtual Battlespace-2 Missions. (2011). Green, C., Leibrecht, B.C., & Fite, J.E. (DTIC No. ADA548308).

The Virtual Battlespace-2 (VBS2) training simulation provides special feedback capabilities for supporting mission after action reviews (AARs). To help AAR facilitators leverage the software's special AAR capabilities, the VBS2 AAR Guide was created to serve as a professional development and performance support tool. Full details on the development of the guide can be found in ARI Technical Report 1294, Guidelines and Tools for VBS2 Mission After Action Reviews: Development and Evaluation. The guide incorporated doctrinal AAR guidelines as well as best practices gleaned from academic and technical literature. The guide underwent iterative review by schoolhouse leaders and instructors during initial development. The guide was then field tested by cadre members of three different Army courses and revised based on their feedback. This publication describes the contents, organization, and presentation style of the guide. It includes the complete guide along with suggestions for utilizing the materials to realize optimal benefits. The products are the culmination of a multi-faceted research program that developed methods and measures for communicating tactics, techniques, and procedures to Soldiers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA548308>

RP 2012-01

Army Design Methodology: Commander's Resource. (2012). Grome, A., Crandall, B., Rasmussen, L., & Wolters, H.M. (DTIC No. ADA558054).

With the March 2010 publication of FM 5-0, The Operations Process, the U.S. Army formally introduced Design into its doctrine (Headquarters; Department of the Army, 2010). Design is defined in FM 5-0 as a methodology for applying critical and creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them (p. 3-1). Though many people contend that successful commanders have always performed Design, the codification of Design in doctrine represents a significant organizational change for the Army. Organizational change efforts are often met with resistance, and the intended benefits of the change may go unrealized. The goal of this research product is to provide information about practical application considerations for the Commander when engaging in Design. Content for this research product was developed after a literature review and in-depth interviews with subject-matter experts to identify obstacles to adoption of Design. A number of barriers have the potential to create significant impediments to the integration of Design, including: terminology and language barriers, conceptual barriers, organizational culture barriers, command-level barriers, and applications barriers. This resource attempts to address several of the identified barriers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA558054>

RP 2012-02

Capacity Building in the Operational Environment: Stories and Lessons Learned. (2012). Beal, S.A., Billington, A.Q., & Lerario, M.P. (DTIC No. ADA572054).

Building Partner Capacity (BPC) has emerged as a crucial, non-kinetic process for sustaining operational success, particularly in Afghanistan. As of this writing, there was no definition for BPC in U.S. Army documents that offered a clear and accurate representation of capacity building, as we found it during our research. Nor were there published field manuals specific to or systematic analyses of BPC. These knowledge and information gaps provided the impetus for exploring BPC as seen through the eyes of the leaders, Soldiers, and civilians who applied it. We collected capacity building stories and lessons learned that showed the scope of BPC to be extremely broad and its conditions and determinants to be as varied as the myriad cultures and environments in which Soldiers operated. Those who conducted BPC operations experienced success largely as a function of their knowledge and skills

acquired from trial and error and shaped by environmental circumstances. In addition, because formalized doctrine relative to BPC was largely absent, Soldiers, U.S. Government personnel, and civilians exchanged BPC experiences and conducted themselves according to what they gleaned from them. Such story telling has imparted knowledge and the wisdom of experience throughout military history. The purposes and methods for collecting and telling capacity building stories and lessons learned contained in this book followed that tradition.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA572054>

RP 2012-03

Raven Operator Assessment Tool. (2012). Lipinski, J.J. (DTIC No. ADA564660).

The success of home-unit Raven programs and Raven operational employment depends on effective and efficient Master Trainers (MTs). To this end, the present work presents the development of a field-ready Raven operator assessment tool in a standard Trained-Needs Practice-Untrained (TPU) format. This tool enhances the ability of newly trained Raven MTs to accurately evaluate the Raven operators under their guidance. Evaluation by noncommissioned officers (NCOs) in the Raven MT course indicated near-uniform agreement that the items on the assessment tool were both clearly stated and relevant for the evaluation of Raven operators. More importantly, the vast majority of respondents also indicated that they would use the assessment tool at their home units as an aid for training development and evaluation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA564660>

RP 2012-04

Assessments for the Cross-cultural Advising Curriculum: Student Version. (2012). Cushner, K., Roan, L., Freeman, T.E., & Metcalf, K.A. (DTIC No. ADB383447 / Restricted).

RP 2012-05

Instructor's Guide to Accompany the Cross-Cultural Advising Curriculum. (2012). O'Connor, A., Roan, L., Cushner, K., & Metcalf, K.A. (DTIC No. ADB383454 / Restricted).

RP 2012-06

Enhancing Digital Skills Training: Interactive Multimedia Instruction. (2012). Goodwin, G.A., & Blankenbeckler, P.N. (DTIC No. ADA586612).

A task-centered instructional strategy was adapted to help digital system trainers apply principles of learning to enhance training. The task-centered strategy is derived from the work of David Merrill and has been used for many domains of training. This task-centered approach differs from training typically seen in digital system classrooms in that it encourages more active engagement by the students. Additionally, the strategy incorporates five training principles to maximize training effectiveness. These principles are that training be presented in the context of real-world tasks, that learners activate relevant prior knowledge, that learners observe a demonstration of the skill to be learned, that learners apply their new knowledge and skill, and that learners integrate their new skill into their daily activities. A train-the-trainer approach was developed into an interactive multimedia instructional package (IMI). The IMI consists of six modules that cover how learning and memory work, how to overcome classroom challenges, understanding principles of training, a training example based on the five examples, and a review. See also ADM002368, Interactive Multimedia Instruction package DVD.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA586612>

RP 2012-07

Assessments for the Cross-cultural Advising Curriculum: Instructor Version. (2012). Cushner, K., Roan, L., Freeman, T.E., & Metcalf, K.A. (DTIC No. ADB383155 / Restricted).

RP 2013-01

Exploring Strategic Thinking: Insights to Assess, Develop, and Retain Strategic Thinkers. (2013). Wolters, H.M., Grome, A., & Hinds, R.M. (DTIC No. ADA577290).

This research product provides a thorough examination of the question: How can the Army assess, develop, and retain strategic thinkers? Expert input from within and outside the military provide a variety of perspectives that highlight areas of convergence and divergence, as well as, exemplar techniques, processes and insights that inform and change the conceptualization and practice of strategic thinking in the military. This compendium does not provide the answer to all of the Army's strategic thinking

challenges, but it does provide many possible avenues to explore with the goal of enhancing the Army's strategic thinking capabilities.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA577290>

RP 2013-02

Sociocultural Systems: The Next Step in Army Cultural Capability. (2013). Strong, B.E., Babin, L.B., Zbylut, M.L., & Roan, L. (DTIC No. ADA591027).

Current Army cultural training is useful and necessary, but significant focus is on how one individual interacts at an interpersonal level with another individual or group of individuals. However, our notion of cross-cultural effectiveness in military operations is incomplete if it does not include the concept of sociocultural systems. Discussions about how to improve the Army's cultural capability for future operations must include a discussion of sociocultural systems and how the Army can evaluate them, influence them, and operate effectively within them. This research product is an anthology of chapters written by some of the best and brightest in academia and government on a host of topics relevant to sociocultural systems and the operational environment. The anthology reflects an interdisciplinary perspective with contributors who represent a variety of professional domains, including (but not limited to) political science, communications, psychology, anthropology, intelligence, sociology, and the geosciences. The anthology contains 17 chapters addressing diverse topic areas, including humanitarian assistance, heritage, cultural narratives, female engagements, internally displaced populations, clans, property, and water. Chapters also address a number of countries other than Afghanistan and Iraq (e.g., Somalia, Mali).

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA591027>

RP 2013-03

Decoding Nonverbal Behaviors in Cross-Cultural Contexts. (2013). Ruark, G.A., Rast, D.E., Yager, M., Strong, B.E., Zbylut, M.L. (DTIC No. ADM202979 / DVD).

The operational environment can present communication challenges to Soldiers who engage a different culture. While the process to learn the spoken language is difficult, the ability to decode nonverbal behaviors is a skill more easily developed and applied. This research product contains a facilitator's guide and software to help Soldiers develop the knowledge, skills, and abilities (KSAs) to decode nonverbal behaviors across cultures. The curriculum is culture general with the intent of instilling Soldiers with foundational KSAs that can be applied to any culture. The instructor's guide is broken down by module (six in all) and includes a script for each module; pre- and post-test items and answers; suggested topics an instructor can use to facilitate classroom discussion; and instructions on how to install the software. The educational curriculum will provide Soldiers with the baseline KSAs required to enter any culture and begin to learn the nonverbal behaviors.

RP 2014-01

Social Perspective Taking Curriculum: Instructor's Guide. (2013). Roan, L., Metcalf, K.A., Young, L., Gehlbach, H., & Freeman, T.E. (DTIC No. AD1012302 / ADM203011 / Restricted).

RP 2014-02

Training Aide: Research and Guidance for Effective Training. User Guide. (2013). Plott, B., & Hutchins, S. (DTIC No. ADA595403).

This is a user guide for the web-based tool called Training Aide: Research and Guidance for Effective Training (TARGET). TARGET is a database of training effectiveness research findings that provides information on the relationships between training methods and performance. TARGET provides query-based searches of the training literature database, numerous visualizations of the relationships between training methods and performance, and it is updateable as additional training research is generated so that the tool stays current with state-of-the-art training research developments. It was designed to assist users in better understanding the relative effectiveness of different training methods for acquiring/transferring cognitive skills. The database includes six primary types of training methods (i.e., part task training, task difficulty sequencing, error prevention, scaffolding, learner control, and exploratory learning), as well as factors that moderate their effectiveness, such as skill type being trained, trainee characteristics (e.g., experience level), and type of training performance outcome (e.g., procedural knowledge, transfer).

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA595403>

RP 2014-03

Organizational Social Effectiveness: An Annotated Bibliography. (2014). Shuffler, M., Keller-Glaze, H., Strong, B.E., Weyhrauch, W.S., Bryson, J.J., & Metcalf, K.A. (DTIC No. ADA597334).

Due to an increased emphasis in the Army to improve leader development, an annotated bibliography was compiled to provide readers an introduction to a body of research on concepts related to organizational social effectiveness. An interdisciplinary literature search for articles on impression management, self-monitoring, social intelligence, social effectiveness, social competence, and political skill resulted in 120 articles selected for inclusion in this bibliography. References to each article are provided with a brief summary of the purpose and central conclusions. The list is divided into two sections, empirical articles, which report on work conducted for the purpose of exploring the construct and its function and relationship with other variables, and measurement and construct development articles, which consist of conceptual discussions and scale development articles. We discuss the relevance of organizational social effectiveness, particularly in regard the concepts investigated, to Army leaders in specific roles (e.g. advisors) and the Army's leadership model in general.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA597334>

RP 2014-04

Automated Intelligent Training with a Tactical Decision Making Serious Game. (2014). Jensen, R., Presnell, B., Lunsford, J., & Cobb, M.G. (DTIC No. ADA596743).

The Intelligent Game-Based Evaluation and Review (InGEAR) capability is a game-based training system that affords junior officers the opportunity for self-training in tactical command skills. This leverages two existing technologies: (i) Follow Me, a small unit leader tactical training game used by instructors and cadets at the United States Military Academy at West Point, and (ii) an intelligent tutoring system (ITS) for automated delivery of tailored evaluation and feedback in scenario-based exercises. InGEAR's objective is to combine game-based training capabilities with learner-centric scenario editing, performance assessment, and feedback to enhance learning and simplify instructors' taskload. These capabilities provide instructors with viable options for dealing with time constraints that limit the opportunities most cadets have for direct feedback on their own decisions and performance.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA596743>

RP 2014-05

Task Analyses for Difficult-to-Assess Collective Tasks. (2014). Bryson, J.J., Barney, R.D., Curnow, C.K., Conrad, T.M., Leonard, A.L., Keller-Glaze, H., Tucker, J.S., & Vowels, C.L. (DTIC No. ADA597450).

In a previous report involving collective measurement, Wetzel-Smith and Mitchell (1986) drew attention to three essential aspects involving the measurement of collective performance including: collective task performance depends on individual subtask proficiency; when the tasks require more direct coordination; the unit skill levels are higher than the level of individual skills; and units that receive performance feedback improve over units that do not receive feedback. The present research effort involving multi-echelon measurement has three main goals: 1) building upon earlier research, conduct a comprehensive review of the literature regarding many different areas of collective performance measurement, 2) conduct interviews with Army subject matter experts (SME) to better understand Army collective tasks and measurement issues, and 3) obtain measurement ideas from nonmilitary measurement experts. This product outlines the process of conducting a task analysis for three difficult to measure collective tasks, conduct a key leader engagement, establish a host nation police force, and partner with host nation forces. This product touches on all three goals of the research effort.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA597450>

RP 2014-06

Leadership Training for Leader Influence and Emotions. (2014). Ratwani, K.L., Orvis, K.L., & Ruark, G.A. (DTIC No. ADB397523 / Restricted).

RP 2014-07

Instructor's Guide for Ethical Climate Training for Army Leaders. (2014). Horn, Z.N., Orvis, K.L., & Zbylut, M.L. (DTIC No. ADB398386 / Restricted).

RP 2014-08

Unit Focused Escalation of Force Training Kit. (2014). Johnston, J.C., Leibrecht, B.C., Topolski, R., Vowels, C.L., & Singer, J.T. (DTIC No. AD1008166 / DVD).

To protect non-combatants in the operational environment, U.S. Soldiers must apply escalation of force (EOF) procedures in uncertain and fast-paced situations. In response to Army needs, a prototype EOF Training Kit was developed to address methods for training critical EOF competencies. Included in the EOF Training Kit are tactical EOF scenarios for three mission types and three levels of expertise, along with executive and supporting materials. Two versions of each scenario are provided- interactive desktop simulation and video viewing. The EOF Training Kit underwent iterative internal review and revision during development. It was then reviewed by Soldiers (currently serving roles as trainers/mentors) from operational units and it was revised based on their feedback. This document describes the EOF Training Kit's characteristics, contents, organization, learning context, and presentation style. It includes the complete EOF Training Kit (enclosed DVD) along with suggestions for utilizing the contents.

<http://www.dtic.mil/get-tr-doc/pdf?AD=AD1008166>

RP 2015-01

Prior Knowledge Assessment Guide. (2014). Stallings, G.M., Dyer, J.L., Wampler, R.L., Cobb, M.G. (DTIC No. ADA616387).

The goal of Army instructors is to deliver the best possible instructional experience so students can increase their knowledge and transfer it to their duty positions. A major means of accomplishing this goal is to tailor training to the individual student, a concept espoused in the Army Learning Model. In order to tailor training, one must first identify the critical differences that distinguish individuals who are likely to have problems with course content vs. those who will not. One objective of ARI's tailored training research is to identify measures which predict student performance in a variety of courses with different student populations. In agreement with the research literature, relevant prior knowledge has been consistently found to be the best predictor of later performance. It was also determined that experienced instructors had a good understanding of what prior knowledge was relevant for their courses. The purpose of the guide documented in this report is to provide instructors the tools necessary for developing appropriate assessments of prior knowledge, to determine whether these assessments are a good predictor of course performance, and to show them how to apply prior knowledge and course performance data to identify the students who could benefit from tailored training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA616387>

RP 2015-02

Mass Casualty Triage Performance Assessment Tool. (2015). Curnow, C.K., Barney, R.D., Bryson, J.J., Keller-Glaze, H., Vowels, C.L. (DTIC No. ADA616388).

This report contains a description of a tool for mass casualty triage assessment which is a primary task for units with the Defense Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) Response Force (DCRF) mission. Such units provide lifesaving and sustaining support, including medical triage, to civil authorities following a catastrophic event. The tool was developed to be easy to implement and score by a military trainer but also provide substantive information about a trainee's performance. Unit personnel reviewed the tool for accuracy and functionality. A prototype of medical triage assessment, instructions on how to use it, and a scoring rubric are included. The description of the tool's development is given in Curnow, Bryson, Barney, Keller-Glaze, and Vowels, 2015. Development of a Mass Casualty Triage Performance Assessment is ARI Technical Report 1350.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA616388>

Research Notes

RN 2000-01

Training Battlefield Critical Thinking and Initiative. (1999). Cohen, M.S., Thompson, B.B., Adelman, L., Bresnick, T.A., & Riedel, S.L. (DTIC No. ADA369128).

The first objective of this research was to explore and identify the cognitive skills that individuals need to function effectively in domains that require them to cope with uncertainty, change and conflicting purposes. The second objective was to develop and test methods for training those skills in the context of Army battlefield decision making. The training aimed at improving the ability of Army tactical staff officers to grasp the essential elements of a complex, uncertain, and dynamic situation, visualize those elements in terms of their organizational goals, and take action in a timely and decisive manner. The identification of cognitive skills to be trained and training strategies is based on an original theory of critical thinking skills, the Recognition/Metacognition (R/M) Theory. The theoretical and empirical foundations of the R/M model are described using literature on mental models, expertise, behavioral decision-making, and pattern recognition. The critical thinking skills developed for training include (1) developing and using appropriate mental models of high-order purpose and of time orientation, and (2) applying critical thinking strategies to these models, including the identification and filling of critical information gaps and conflicts in situation understanding, goals and plans, and identifying and evaluating underlying plan assumptions. Training is implemented in a stand-alone Compact Disk (CD). <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA369128>

RN 2000-02

Modernizing the U.S. Army Research Institute's Attitude and Opinion Survey Programs. (1999). Tourangeau, R., Miller-Steiger, D., Cohen, M., Hanway, S., & Conner, S. (DTIC No. ADA370573).

The aim of this project was to assess the quality of ARI's current survey programs, make recommendations for improving them, and to draft regulations that incorporated these recommendations and brought the regulations up to date. Information was gathered about ARI's current attitudinal, command climate, and occupational analysis studies by examining survey documentation and speaking with the staff who carry out the studies. Information was also collected about a number of comparable surveys done by the other services, academic survey organizations, and private firms, and the users of the ARI surveys were queried to assess their satisfaction with ARI's services. ARI was found to use sound methods, comparable to those used by other survey organizations and it achieved similar response rates, and ARI customers expressed a high level of satisfaction. Recommendations are made for continuing enhancement of ARI survey programs. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA370573>

RN 2000-03

Contract for Manpower and Personnel Research and Studies 2: Year 1. (2000). (DTIC No. ADA372487).

This report documents and summarizes the activities of the first year of a 5 year (1 base year and 4 option years) project to provide the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) short and medium term scientific and technical support services in the solution of problems related to manpower and personnel. The program is referred to as the Contract for Manpower and Personnel Research and Studies 2 (COMPRS-2). HumRRO's primary responsibilities are to administer COMPRS 2 for ARI under firm fixed price contracts by managing three interrelated tasks: (1) managing the COMPRS-2 program in accordance with established operating procedures; (2) receiving and processing individual Statements of Tasks from ARI; and (3) managing, reporting progress on, and documenting the completion of delivery orders. Thirteen delivery orders, documented in this report, were awarded during the first year. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA372487>

RN 2000-04

Observations of Infantry Courses: Implications for Land Warrior Training. (2000). Centric, J.H., Wampler, R.L., & Dyer, J.L. (DTIC No. ADA372853).

The research examined the potential impact of the Land Warrior (LW) system on three Infantry courses: the Infantry Officer Basic Course (IOBC), Basic Noncommissioned Officer Course (BNCOC), and Infantry One-Station Unit Training (OSUT). The areas investigated within each course were weapons training

including use of the target acquisition capabilities of the LW, communications training, land navigation, operational techniques and tactical operations, field exercises, and computer skill training. Formal observations were made of these blocks of instruction in each course. The report describes both major and minor impacts upon course content and training resources. In addition, different options are presented on how to integrate LW training into the courses. Because the LW system was evolving during the research period, the training impacts represent the best estimate at the time and could change as a result of LW system changes, institutional course changes, or both. The actual impacts will depend on decisions made regarding which LW tasks should be taught, the scope and depth of this training, and the performance standards required for these tasks.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA372853>

RN 2000-05

Predicting Enlistment Propensity of Young African Americans. (2000). Hughes, A.O., Khatri, D.S., Ausbrooks, B.N., Sims, E., Mitchell, T., & Shanklin, W. (DTIC No. ADA372543).

This three-year research study was designed to develop and test a structural model to predict enlistment propensity of young African American males and females, ages 16-19 years. The final report presents two sets of findings derived from a survey of 460 African Americans in the District of Columbia public senior high schools during Spring Semester 1996. The findings are: predictive findings that employed logistic regression and comprehensive descriptive findings based on summary statistics. The school catchment areas have been used as the measure of socioeconomic status (SES). For this study, it should be understood that the prediction of propensity to enlist is the reported favorable attitude to enlisting in a military service by a respondent. A long-term longitudinal study would be required to ascertain the relationship between a reported favorable attitude to enlist on the part of an individual and the actual enlistment of that individual.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA372543>

RN 2000-06

An Informational Approach to Skill Transfer. (2000). Lintern, G. (DTIC No. ADA372486).

This research program studied the nature of fundamental skills underlying the expertise of aircraft pilots. The research program included a review of the issues facing flight instruction. The specific tasks of landing a light aircraft and of navigating an aircraft through an unfamiliar area were selected for intensive study. The experimental projects undertaken in this program used a flight simulation system developed around a real time computer generated visual display. Two experimental paradigms were exploited. One was used to explore the visual information and skills used to support the aircraft landing task. As a means of identifying critical sources of information, experiments with experienced pilots examined how distortions in the simulated visual scene affected landing performance. The second paradigm evaluated transfer in a mission rehearsal task. A navigational database was developed and displayed via the visual simulation system. Flight students were taught navigational skills under different experimental conditions and were then tested in a realistic navigation condition.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA372486>

RN 2000-07

Overview of ARI Recruiting Research. (2000). Borman, W.C., Horgen, K.E., & Penney, L.M. (DTIC No. ADA374580).

This report presents in briefing form a summary of the research conducted by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) on Army recruiting and selected recruiting research from other Service laboratories. The briefing is organized around a model of Army recruitment that shows the important factors contributing to successful recruiting. The first section of the briefing outlines and explains the model and the subsequent sections review the research pertinent to each section of the model. The briefing concludes with summaries of the research findings in each area and directions for future research.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA374580>

RN 2000-08

Thinking Strategically About Army Strategic Leadership: Revolution or Evolution. (2000). Boyce, L.A., Gade, P.A., Zaccaro, S.J., & Klimoski, R.J. (DTIC No. ADA377891).

The 1999 Senior Leadership Seminar held at George Mason University brought together key senior Army leaders and civilian leadership experts from academia and industry to discuss implications for

leadership policy and practices within the framework of Army challenges, such as geopolitical and socioeconomic changes. Presentations by Dr. Ireland of Baylor University highlighted effective strategic leadership and human resource management practices for the future Army. GEN (Ret.) Sullivan followed with his reflection of the Army perspective of the leadership challenges. Following the presentation, the participants engaged in executive round-table discussions focused on: (1) how to reinvigorate and enliven the leadership development process in the Army, and (2) how to move the TLS imperatives into the future, synchronizing TLS with DOM. A major outcome from the seminar was a shared understanding of leadership issues by senior Army leaders, industry leadership consultants, and academic leadership experts. This document provides the background information leading to and shaping the seminar and an overview of the seminar process and outcomes. Supporting detailed documentation is also included in the appendixes.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA377891>

RN 2000-09

The Commanders' Integrated Training Tool for the Close Combat Tactical Trainer 1: Functional Architecture Design. (2000). Dannemiller, B., & Gossman, J.R. (DTIC No. ADA377870).

This research note details the recommended design of the Commanders' Integrated Training Tool (CITT) application. The CITT is designed to provide commanders and training developers with ready access to information concerning the Close Combat Tactical Trainer (CCTT), existing CCTT training support packages (TSPs), and guidance and tools for modifying and developing CCTT TSPs. This research note includes numerous Integrated Computer Aided Manufacturing Definition or IDEF/phi diagrams and their derivatives. These documents can be used by software programmers in the development of the objective CITT. The documentation is fully supportive of the Army Training Information Management Program (ATIMP) Systems requirements as delineated by the Department of Defense Enterprise Model and was completed in accordance with industry accepted modeling procedures and standards. The purpose of this model is to identify and organize information that supports the development of a comprehensive application that provides for the creation, archiving, and retrieval of TSPs. It provides all required documentation for the development of an application that details the framework and all necessary tools for the creation and modification of TSPs for use in CCTT. This includes data on the structured training process and the exercise development process, all of which are key features of the CITT.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA377870>

RN 2000-10

Initial Data Collection and Preliminary Analyses for Research on First Term Soldier Attrition and Management Project First Term. (2000). Sipes, D.E., & Sadacca, R. (DTIC No. ADA379284).

The First Term Program is a six-year effort to research the causes of attrition over the first enlistment term. The longitudinal design follows a cohort of fiscal year 1999 accessions throughout their first term. This report documents the development and initial administration of three data collection instruments: Soldier Reception Survey (SRS), End-of-Training Survey (EOT), and Exit Survey. Theory behind inclusion of specific survey items and their role in attrition modeling is discussed. Where specific survey items were taken from existing surveys, a cross-reference is provided. Preliminary scale development from a subset of SRS data is described, as well as quality of data from early SRS administrations.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA379284>

RN 2000-11

Continued Emphasis on Leadership: One Solution for Future Soldier Effectiveness. (2000).

Tremble, T.R., & Bergman, S.M. (DTIC No. ADA380925).

The U.S. Army is undertaking fundamental changes to prepare to meet the missions of the 21st century. Through initiatives focusing on 25 or more years into the future, the Army is working hard to capture and integrate to fully advantage emerging technologies, organizational structures, and operating procedures. However, Army leadership recognizes first and foremost the importance of its people--Soldiers--to force effectiveness. In this regard, the Army is seeking to insure readiness of Soldiers for future operations and future job performance. When the focus is on future jobs and future missions, application of the scientific methodologies traditionally used for personnel and training decisions is complicated. Central to these methodologies is description of the performances involved in or needed for job or mission effectiveness. Such description cannot of course be made with certainty when focusing on the future. That is, when planning for the future, the focus is on performances that are not now fully in existence and available for description through survey of job incumbents, observation of work samples, or other traditional approaches. These uncertainties about the nature of future jobs risk the effectiveness of the

Army systems that build and maintain the personnel force for future performance.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA380925>

RN 2000-12

Specifications for an Operational Two-Tiered Classification System for the Army. Volume 2: Appendices. (2000). Zeidner, J., Johnson, C., Vladimirovsky, Y., & Weldon, S. (DTIC No. ADA385348).

The broad objective of the present study is to design an improved two-tiered classification system and to compare its classification efficiency to the current operational aptitude area (AA) system. The total data set includes about 260,000 recruits serving in 170 different entry-level MOS during 1987-1989. The set includes all available ASVAB/Skill Qualification Test (SQT) data for MOS with adequate sample sizes collected by ARI during this time frame. The proposed system to be evaluated in this study would use an invisible or black-box first tier in which separate assignment variables (AVs) are computed for up to 150 job families. The first tier AVs are to be used in assigning recruits to entry-level MOS. The second tier is used in recruiting, counseling and administration. The proposed system to be evaluated in the visible second tier uses up to 17 families. It is proposed that the aptitude area scores of the visible system be recorded on each Soldier's personnel record. The principal finding of the present study is that the unbiased overall mean predicted performance (MPP) of the 150 job family structure is .195 compared to the MPP for the existing operational system of .023, a gain of more than eight fold. The unbiased overall MPP for the 17 job families is .146. The 17 family system is obtained by shredding the existing AA families within the boundaries of the operational classification families to maximize the Horst index. Findings continue to support an early differential assignment theory (DAT) principle that maximum MPP is obtainable by using AVs for all jobs having adequate or stable validity data. The results clearly demonstrate that considerable classification efficiency is potentially obtainable from the existing ASVAB if it is used in accordance with DAT principles.

<http://www.dtic.mil/dtic/tr/fulltext/u2/a385348.pdf>

RN 2001-01

Contract for Manpower and Personnel Research and Studies 2: Year 2. (2000). (DTIC No. ADA382707).

This report documents and summarizes the activities of the first two years of a 5-year (1 base year and 4 option years) project to provide the U.S. Army Research Institute (ARI) non-personal, short- and medium-term scientific and technical support services in the solution of problems related to manpower and personnel. The program is referred to as the Contract for Manpower and Personnel Research and Studies II (COMPRS-II). HUMRRO's primary responsibilities are to administer COMPRS-II for ARI under firm fixed-priced contracts by managing three inter-related tasks: (a) managing the COMPRS program in accordance with established operating procedures; (b) receiving and processing individual Statements of Tasks from ARI; and (c) managing, reporting progress on, and documenting the completion of delivery orders.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA382707>

RN 2001-02

An Examination of the State of Workplace Learning at the End of the 20th Century. (2000). Schlechter, T.M. (DTIC No. ADA382706).

This research note provides a snapshot of the state of workplace learning at the end of the 20th century. It also describes the training investment made by U.S. organizations, including the U.S. Army. This research note also reviews the links between workplace learning and a few central tenets of social cognition: (a) situated cognition, (b) regulatory behaviors, (c) efficacy, (d) shared mental model, and (e) transactive memory.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA382706>

RN 2001-03

Development and Evaluation of a Program for Training Information Management in Distributed Organizations. (2000). Entin, E.B., Entin, E.E., Hess, K.P. (DTIC No. ADA383334).

A theory-based model of information management was created to develop a training program to train effective information management. The training program focused on the specific behaviors prepare, filter, scan, read, and act and helped information managers deal more effectively with large amounts of information. Implicated ways in which the training paradigm could be improved and developed even further. The program fits in a niche that has been overlooked by researchers. The program focused

exclusively on the process necessary to manage and integrate large amounts of information. This paper concludes that until automatic filtering systems improve dramatically enough to make the need for human filtering obsolete, a training program that focuses on specific behaviors such as Prep, Filter, Scan, Read, and Act can help people manage large amounts of information more effectively. Not only can people learn to better recognize and focus on important information, but they can learn to change behavior in such a way that they no longer contributes to other people's overload.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA383334>

RN 2001-04

Army Culture. (2000). Winslow, D. (DTIC No. ADA383899).

Methodological approach to the study of organizational culture gave rise to an economy of explanation which requires three levels of analysis: integration, differentiation, and fragmentation. Studies were classified as integrationist if they assumed or supported the idea of broad coherent patterns across the organization and/or placed an emphasis on a stable set of ideas, values, and norms characterizing the organization as a whole. Studies were classified as differentiated if they looked at specific groups or subcultures within the organization. Studies were classified as fragmented if they looked at the multiplicity of views (no consensus) and complexity focus (not clearly consistent or inconsistent). Army culture reflects the impulse to order (integration) the chaos (fragmentation) of warfare. The cross-pull between order and chaos is a key principle of Army culture. Since the chaos of peace operations is qualitatively different from the chaos of war, the structuring of that chaos is bound to change.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA383899>

RN 2001-05

A Review of Research on the Laser Marksmanship Training System. (2001). Smith, M.D., & Hagman, J.D. (DTIC No. ADA388198).

This report reviews research on use of the Laser Marksmanship Training System (LMTS) to support small-arms marksmanship training and live-fire performance prediction. In general, the findings to date indicate that (a) LMTS established rifle battlesight zero should not be used for record fire qualification without prior live-fire zero confirmation, (b) LMTS is capable of supporting effective initial entry, as well as sustainment, rifle marksmanship training although further research is needed to provide a definitive conclusion in regard to the latter, (c) LMTS based performance can accurately predict the likelihood of both rifle and pistol live-fire qualification, and (d) these predictions provide an associated set of empirically derived, live-fire performance standards needed to support the implementation of competency-based small- arms training with LMTS as well as the use of LMTS for validating previous live-fire qualification performance when outdoor range facilities are not readily available or when mission requirements dictate.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA388198>

RN 2001-06

Bradley Fighting Vehicle M2 / M3 A3: Training and Soldier System Observations. (2001). Salter, M.S. (DTIC No. ADA388153).

This paper reports some training and Soldier systems observations about the newly introduced M2A3 Bradley Fighting Vehicle (BFV). Some cautions and lessons learned are included as they relate to the impact of the Bradley AS on institutional and unit training, especially in the areas of digitization and device use.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA388153>

RN 2001-07

The Effects of Battalion Staff Stabilization on Individual and Unit Performance: A Preliminary Investigation. (2001). Ardison, S.D., Bell, D.B., Tiggler, R.B., Milan, L.M., Bullis, R.C., Bourne, D.R., & Evans, W.E. (DTIC No. ADA387969).

This research explored the feasibility and desirability of extending the time field-grade officers spend in battalions as either XO or S3 (and, thus, as part of a command team) from 12 to 24 months. A combination of surveys and interviews with brigade-, battalion-, and company-level leaders from seven stabilized battalions (i.e., XO, S3, CDR, and CSM serving together 24 months) and seven similar non-stabilized battalions was conducted. The relationships between extended tenure of battalion staff and measures of individual and unit performance, cohesion, communication, and command climate were investigated. Results showed that stabilization of battalion staff was not possible to maintain in a

majority of the cases (six of the seven units). Although improvements in leadership skills and abilities were associated with longer command team tenure, the results are those of a preliminary investigation and not intended for generalization to the Army-at-large.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA387969>

RN 2001-08

Trends in Weapon Systems Performance at the National Training Center. (2001). Johnson, C.A. (DTIC No. ADB267029 / Restricted).

RN 2001-09

Digital Skill Training Research: Preliminary Guidelines for Distributed Learning. (2001). Childs, J.M. (DTIC No. ADA391742).

This task was aimed at the development of guidelines for distributed learning (DL). A matrix was generated to evaluate the effectiveness of various DL media for training representative knowledge/skill types. Of the approximately 200 DL studies initially reviewed, only 15 met predetermined selection criteria (empirical, learning outcome focus, conducted since 1996, applied training environments). Using a 3-point Likert scale, each study was rated according to degree and direction of statistical difference reported between treatment (DL) and control group learning outcomes. Effect sizes were computed for those studies reporting standard deviations in learning outcomes. The majority of studies rated (77%) showed no significant difference in learning outcomes between DL-trained groups and their controls. Where differences were found, they favored DL-trained groups. Twelve factors are recommended as guidelines for designing, conducting, and evaluating effective DL.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA391742>

RN 2001-10

Transfer of Training Revisited. (2001). Auffrey, A.L., Mirabella, A., & Siebold, G.L. (DTIC No. ADA392933).

The research note contains a literature review of research on the transfer of training; it is intended for use by educational researchers and psychologists. The note includes information and comments on the relevance of transfer of training to what it labels as Army XXI environments, i.e., environments that might be found in the Army in the future and similar to those in what have been called the digital force and the objective force. The note presents different conceptualizations and measures of the construct of transfer of training, criticism of experimental findings in the area, a listing of the instructional and non-instructional sources of variation in the transfer of training, transfer enhancement through constructivist methods, additional thinking skills research, and the role of technology. Future research directions are suggested.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA392933>

RN 2001-11

Mentor: Dialog Agent System for Mentoring and Conversational Role-Playing. (2001). Murray, W.R., Sams, M., DeSmedt, W.H., & Loritz, D. (DTIC No. ADA392955).

The goal of this SBIR program was to provide authorable, dialog-enabled agents for tutoring and performance support systems. Users interact with agents who carry out strategies and goals and can engage in mixed-initiative dialog via a natural language understanding and generation system. Non-programmers can author new domains and scenarios and create new dialog agents. The dialog system is authorable by non-computational linguists. The system has two types of agents, Mentor agents and Conversational agents. The Mentor agent is a simulated subject matter expert (SME) that provides troubleshooting and problem solving advice. Mentor engages in a dialogue with trainees, helping them solve problems by taking them through logical courses of action and asking and answering domain-specific questions. Conversational agents are used for role-playing scenarios. The only real difference between the two agents is that Conversational agents do not have specific problem solving strategies. Both Mentors and Conversational agents have domain specific knowledge and access to a common sense knowledge base. This report describes the capabilities and limitations of results of this Phase II effort.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA392955>

RN 2001-12

Reflections on the Structure of the Future Training System. (2001). Campbell, C.H., Holden, W.T. (DTIC No. ADA393431).

In redesigning itself for the future, the Army is grappling with a broad array of issues and challenges. Geopolitical changes, technological capabilities for both operational and training systems and the demographics of the 21st century force must all be considered. Developments outside the mainstream of military transformation, such as the results of research into group and team behaviors and learning strategies, are also relevant. This paper addresses collective training needs and approaches for future brigade and below staffs. It makes the case for a training transformation, and presents descriptions of the objective training system and the research and policy development needed to construct that system. Three areas are considered: (1) issues and conditions that are driving the need for a training transformation; (2) a description of the objective training system that will enable the vision of the future brigade capabilities to become reality; and (3) recommendations for studies, research, development, and policy formulation needed to achieve the training transformation. This paper will serve as input to a research and development plan for U.S. Army Research Institute for the Behavioral and Social Sciences' Science and Technology Objective 02, Methods and Measures of Commander-Centric Training, by identifying key research issues and approaches for future training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA393431>

RN 2002-01

Learning to Suppress Competing Information: Do the Skills Transfer? (2001). Gernbacher, M.A. (DTIC No. ADA395942).

This report discusses the laboratory research on the cognitive mechanism of suppression. The goal of this study is to identify the cognitive processes and mechanisms that underlie language comprehension and comprehension in general. Suppression is conceptualized as an active dampening of the automatic activation of mental representations. Thus, suppression attenuates the interference caused by the activation of inappropriate or irrelevant information. In my previous research, I have empirically illustrated the crucial role that suppression plays in many cognitive tasks. Furthermore, during a previous funding period I discovered that (1) the mechanism of suppression is under strategic control, and (2) persons can be taught to suppress competing information. The next stage of research greatly extended these two recent discoveries by answering the following question: Does training in suppression of one type of competing information transfer to skill in suppressing another type of competing information? This question was answered through a series of laboratory experiments. The results of these experiments inform us about the transferability of training of the crucial skill of suppression. Discovering that training in suppression in one domain leads to improved suppression in another domain has great theoretical and practical implications.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA395942>

RN 2002-02

Recruitment to the All-Volunteer Force. (2001). Harries-Jenkins, G. (DTIC No. ADA397593).

Western military establishments which have decided to shift from conscription (the draft) to volunteerism as the basis of recruitment to their armed forces, commonly face very considerable challenges. The economic dimensions of the latter are critical, but the social, political and cultural issues associated with the change of recruitment policy cannot be overlooked. From the analysis of these dimensions and issues, we can begin to establish a model of good practice which is both a refinement of traditional approaches and an acceptance of more radical alternatives. Such a model reflects a five-step strategy; the alteration of goals and objectives; substitution between personnel; privatization and civilianization; internationalization, and changes to conditions of recruitment and service (ASPIC).

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA397593>

RN 2002-03

The Characterization and Prediction of Soldier Performance during Routine Service and in Combat. (2002). Dover, S.H. (DTIC No. ADA399051).

This study aimed to explore (1) the relationship between Soldier performance during routine service and performance in combat; (2) the differential efficiency of selection scores in predicting routine vs. combat performance; and (3) the construct structure portraying combat Soldier performance. Four groups of Israeli Defense Force Soldiers were subjects in the study; they were evaluated by ratings obtained by their direct commander, as well as hard data measures. Ratings of peacetime and combat performance showed significant moderate correlations. The ratings represent a meaningful construct structure and are efficient in predicting combat performance. Factor analysis yielded two factors each representing combat Soldier performance in battle and performance during routine service, and three factors

representing non-combat Soldier performance. The predictive and constructive validity they show make the questionnaires employed in this study both efficient predictors and useful evaluation procedures of Soldier performance in combat. These results have direct implications to unit command and unit management during routine service and to attitudes which commanders would strive to impart in their Soldiers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA399051>

RN 2002-04

Exploring the Nature and Acquisition of Tacit Knowledge for Military Leadership. (2002). Antonakis, J., Hedlund, J., Pretz, J.E., & Sternberg, R.J. (DTIC No. ADA400486).

In this report we first introduce traditional notions of leadership and their limitations, and the importance of tacit knowledge for military leadership. We then present Sternberg's (1985, 1988, 1997) triarchic theory of intelligence and the role of practical intelligence and tacit knowledge in successful leadership. Next, we examine in-depth the nature of tacit knowledge, how it is defined and measured, how it differentiates experts from novices, and how it is bounded. Furthermore, we present a model of practical intelligence and tacit knowledge acquisition, and demonstrate how tacit knowledge may be acquired experientially and vicariously. Based on the literature reviewed, we draw hypotheses that we test empirically. We then present the results of our findings and discuss their theoretical and practical implications. Last, we relate our findings to the purpose of this report, and to the research questions we sought to answer.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400486>

RN 2002-05

Contract for Manpower and Personnel Research and Studies 2: Year 3. (2002). (DTIC No. ADA398756).

This report documents and summarizes the activities of the first 3 years of a 5-year (1 base year and 4 option years) project to provide the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) non-personal, short- and medium-term scientific and technical support services in the solution of problems related to manpower and personnel. The program is referred to as the Contract for Manpower and Personnel Research and Studies II (COMPRS-II). The Human Resources Research Organization's primary responsibilities are to administer COMPRS-II for ARI under firm fixed-priced contracts by managing three inter-related tasks: (a) managing the COMPRS program in accordance with established operating procedures; (b) receiving and processing individual Statements of Tasks from ARI; and (c) managing, reporting progress on, and documenting the completion of delivery orders.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA398756>

RN 2002-06

Intelligent Dialog Tutor and Conversational Agents. (2002). Sams, M., Murray, W.R., DeSmedt, W.H., & Loritz, D. (DTIC No. ADA399439).

The report describes research done to develop a prototype of an easy to use authoring system for an intelligent, computer-based trainer. It focuses on simulated agents who are capable of mixed-initiative dialog with the user through a natural language interface. Trainees converse as they would in normal English discourse asking questions, giving answers, and making comments. The simulated agent generates appropriate responses within any defined domain. The resulting tutor provides individualized instruction based on trained performance.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA399439>

RN 2002-07

Development and Application of an Automated Data Analyzer. (2002). Connelly, E.M. (DTIC No. ADA400503).

In order to seek and test determinants of unit effectiveness, the ADA was developed based on the idea that search and analysis of large amounts of data can be automated if variables can be converted into a standard form. In addition, the methodology permits an analyst to identify, in a first iteration, large sets of variables and associated parameters he/she thinks may be relevant to an issue, and assist in their refinement, combination, and elimination in later iterations. The ADA does this by providing a concise visual presentation of the relationships among a large number of variables. This facilitates identification of variables and combinations of variables, in complex data sets, that are related to mission outcomes and to each other. Project results show that ADA analysis can be used to extract effectiveness

information from the ARI National Training Center (NTC) database for analyst review and automated data analysis. The method allows considerable flexibility allowing the analyst to adjust, modify, and create new analyses with some ease and flexibility. Use of analysis specification files allows automatic documentation and the repeated use of analyses. Complex analyses can be gradually built to assess company/team and task force (TF) performance.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400503>

RN 2002-08

Teamwork Assessment Scales for C² Functions for Battalions and Brigades. (2002). Kyne, M.M., Militello, L.G., Thordsen, M.L., & Klein, G.A. (DTIC No. ADA400488).

This report offers an extensive review of various team literatures, including research from the areas of command and control and industrial/organizational psychology. A complete set of references is included. Leading models of team performance are identified, and, along with their assessment tools, they are analyzed for similarities in concepts, dimensions, behaviors, and behavioral anchors. Based on this analysis, a comprehensive model of advanced team performance (ATP) has been generated and an assessment tool is being developed. Plans for field-testing are outlined.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400488>

RN 2002-09

A Model Based Team Decision Making and Performance Assessment Instrument: Development and Evaluation. Volumes 1 & 2. (2002). Kyne, M.M., Thordsen, M.L., & Kaempf, G. (DTIC No. ADA400491).

A two-year Phase II SBIR effort for the U.S. Army Research Institute (ARI) had as its goals the identification of factors that contribute to advanced team decision making and performance, and the development of a theory-based model of advanced teams. The assessment instrument is one of the products of this research. Volume II is the handoff and instructional package. A summary report of the project has been published as ARI Research Note 2002-10.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400491>

RN 2002-10

A Model of Advanced Team Decision Making and Performance: Summary Report. (2002). Thordsen, M.L., Kyne, M.M., & Klein, G.A. (DTIC No. ADA400497).

A two-year Phase II SBIR effort for the U.S. Army Research Institute (ARI) is described. The goal of the effort was to identify factors that contribute to advanced team decision making and performance to develop a theory-based model of advanced teams. This work produced four products: a review of current team literature, a model of Advanced Team Decision Making (ATDM 2.0), a field test and evaluation of an assessment instrument based on the ATDM 2.0 model, and a package of materials compiled to demonstrate that the model and assessment tool could be "handed off" to and applied by domain personnel. These four products are briefly described. Some issues concerning application of the model are discussed and future directions are outlined.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400497>

RN 2002-11

Developing Effective Military Leaders: Facilitating the Acquisition of Experience Based, Tacit Knowledge. (2001). Cianciolo, A.T., Antonakis, J., & Sternberg, R.J. (DTIC No. ADA400614).

The objective of this project is to explore methods for facilitating the acquisition of tacit (i.e., experience-based) knowledge by military leaders. We are investigating the cognitive information processes through which individuals who gain relatively more from their experiences acquire information from stimuli and events in their environment. As tacit knowledge is a critical component of practical intelligence, we expect to show that facilitating the acquisition of tacit knowledge will, in turn, improve practical problem solving. Improved practical problem solving has obvious implications for improved leadership in the complex, rapidly changing environment in which military leaders must work.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400614>

RN 2002-12

Modeling Human Performance: Effects of Personal Traits and Transitory States. (2002). Witmer, B.G., & Jerome, C.J. (DTIC No. ADA405062).

In a recently published report, Gillis, Hursh, Guest, Sweetman, & Ehrlich (2000) reported the development of a Human Performance Model (HPM) for representing realistic behavior by Computer Generated Forces (CGF) Command Entities (CEs). The model as described by Gillis et al. (2000) includes the effects of experience, stress, sleep, and circadian rhythm on the decision-making performance of CEs, but does not completely describe some other variables (e.g., the effects of intelligence, aggressiveness, and personality type) represented in the implemented version of the model. This report supplements the Gillis et al. (2000) report by fully documenting the implemented HPM to include the effects of these additional variables. This documentation includes flow charts that show how each variable is calculated and how the model components relate to each other. Separate model flow charts are provided for positive, negative, and neutral personality types, along with the equations for computing all model variables. Model deficiencies are identified and improvements are suggested, including better representation of emotions, and inclusion of attention, situational awareness, learning, and leader goals and expectations. Finally, a conceptual model showing how these parameters interrelate is presented.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA405062>

RN 2002-13 — Cancelled

RN 2002-14 — Cancelled

RN 2002-15

Bradley M2A3 / M3A3 Embedded Training System: Initial User Assessment. (2002). Rich, K.L., & Salter, M.S. (DTIC No. ADA408288).

This report documents a limited user test of the prototype Bradley Embedded Training System (BETS). The BETS is designed to be an on-vehicle system, using vehicle hardware and software, and the same training device software as the already fielded BATS, Bradley Advanced Training System. Nineteen M2A3 Bradley-qualified Soldiers performed two gunnery exercises using the BETS and reported their initial impressions about the device and its potential usage. Preliminary results indicated that user satisfaction was high and potential good. Further research is necessary to determine BETS use in training and operational environments.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA408288>

RN 2002-16

Department of the Army Research and Development Organization of the Year Excellence Award. (2002). (DTIC No. ADB282039 / Restricted).

RN 2002-17

U.S. Army Research Institute FY 2001 Government Performance and Results Act Performance. (2002). (DTIC No. ADB282014 / Restricted).

RN 2002-18

Carnegie Hall: An Intelligent Tutor for Command Reasoning Practice Based on Latent Semantic Analysis. (2002). Lochbaum, K.E., & Streeter, L.A. (DTIC No. ADA406129).

Report developed under a Small Business Innovation Research Program 99.2 contract for topic OSD00-CR02. Scenario-based training techniques, e.g., U.S. Army Research Institute for the Behavioral and Social Sciences' (ARI's) "Think Like a Commander," exercise command cognitive readiness skills. These techniques currently depend on discussion with live mentors. Phase I demonstrated that such scenarios could be taught using a web-based interactive facilitator/mentor. The web-based facilitator asks questions relevant to one scenario, and students write short text responses. Using Latent Semantic Analysis' (LSA) understanding of natural language, the intelligent mentor/facilitator analyzes the essay's content and determines the student's weak areas for further questioning. The LSA-based prototype was constructed rapidly and greatly benefited from automatically training the system on a large amount of military text. It did not require the handcrafted knowledge models and rule-bases of conventional intelligent tutors.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA406129>

RN 2003-01

Contract for Manpower and Personnel Research and Studies 2: Year 4. (2002). (DTIC No. ADA406424).

This report documents and summarizes the activities of the first 4 years of a 5-year (1 base year and 4 option years) project to provide the U.S. Army Research Institute (ARI) non-personal, short- and medium-term scientific and technical support services in the solution of problems related to manpower and personnel. The program is referred to as the Contract for Manpower and Personnel Research and Studies II (COMPRS-II). HumRRO's primary responsibilities are to administer COMPRS-II for ARI under firm fixed-priced contracts by managing three inter-related tasks: (a) managing the COMPRS program in accordance with established operating procedures; (b) receiving and processing individual Statements of Tasks from ARI; and (c) managing, reporting progress on, and documenting the completion of delivery orders.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA406424>

RN 2003-02

Ratings of Decision Making Attributes in a Junior Leader Course. (2002). Beal, S.A. (DTIC No. ADA408031).

Cadre and students provided ratings of decision-making attributes during two junior leader courses. Results showed that cadre ratings of students' attributes improved over time, whereas student self-ratings did not show improvements. Initial student ratings tended to be inflated. Cadre ratings were more conservative than student ratings regardless of rating time. Research on naturalistic decision-making and self-appraisal were considered for the purposes of interpreting and explaining discrepancies across rating sources. It was suggested that discrepancies arose because of differences in raters' experience, knowledge, and because of inconsistent or ambiguous performance comparison standards.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA408031>

RN 2003-03

Low Cost PC Gaming and Simulation Research: Doctrinal Survey. (2002). Tarr, R.W., Morris, C.S., & Singer, M.J. (DTIC No. ADA408645).

The U.S. Army Simulation, Training and Instrumentation Command (STRICOM) established a program investigating novel techniques for low-cost/complexity training devices. The U.S. Army Research Institute for the Behavioral and Social Sciences contributed to this program by supporting the investigation of doctrinal issues in low-cost personal computer (PC) gaming. The Institute for Simulation and Training at the University of Central Florida developed an approach for defining game parameters and surveying subject matter experts (SMEs) on doctrinal correctness of game experiences. Doctrinal correctness combines and interacts with cognitive skills and decision-making skills gains in complex ways that make the selection of games for reinforcing training through training a complicated trade-off. Based on prior work, PC games were selected for Infantry and Armor tasks and evaluated for application and doctrinal correctness. The evaluations for the Infantry aspects of *Rogue Spear: Covert Ops*[™] indicated that the game could be used for tactical movement, tactical scenario, and room clearing exercises. The evaluation of *Steel Beasts*[™] were positive in terms of gunnery elements, but there were sufficient doctrinal errors that the overall game was judged to not be useful. The results of this and other efforts indicate the potential usefulness of commercially available off the shelf PC games, although further studies are needed in order to establish guidelines and characteristics for integrating selected aspects of games into ongoing instructional approaches.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA408645>

RN 2003-04

Tacit Knowledge and Practical Intelligence: Understanding the Lessons of Experience. (2002). Hedlund, J., Antonakis, J., & Sternberg, R.J. (DTIC No. ADA412016).

This report addresses the role of practical intelligence and tacit knowledge in understanding how individuals learn from experience and develop expertise. We present background on the notion of practical intelligence as an alternative to conventional conceptualizations of intelligence, and the exploration of the acquisition and utilization of tacit knowledge as elements of practical intelligence. Reviewing research on practical intelligence and, in particular, highlighting findings from over 15 years of research on tacit knowledge. We then address new directions aimed at understanding how individuals learn from experience and acquire tacit knowledge, and present new approaches for identifying and promoting managerial and leadership potential that are based on ongoing research on practical intelligence.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA412016>

RN 2003-05

Reflections on Blended Distributed Learning: The Armor Captains' Career Course. (2002). Bonk C.J., Olson, T.M., Wisher, R.A., & Orvis, K.L. (DTIC No. ADA408041).

The purpose of this study was to investigate how various distributed learning technologies impacted the training of Armor officers in an advanced course, the Captains Career Course. There were three phases to this course – asynchronous, synchronous, and residential. At the completion of one complete course iteration, two groups of students, as well as three instructors and the course advisor were interviewed regarding their experiences with the online learning components. Each group mentioned distinct advantages and disadvantages from the different online components including greater and timelier feedback, realistic scenarios, downtime due to technology problems, and an overwhelming choice of tools and options. Ten key Web-based instruction considerations or issues were mentioned across participants and several recommendations for improving this program and building similar ones were provided.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA408041>

RN 2003-06

Gesture Recognition System for Hand and Arm Signals. (2002). Lampton, D.R., Knerr, B.W., Clark, B.R., Martin, G.A., Washburn, D.A., & Rosas-Anderson, C.J. (DTIC No. ADA408459).

This report describes an evaluation of a computer system for recognizing human hand and arm signals as a means of interacting with virtual environments. The system consists of two video cameras, software to track the positions of the gesturer's head and hands, and software to recognize gestures by analyzing the position and movement of the hands. The software was hosted on a standard PC. A set of 14 gestures from Army Field Manual 21-60, Visual Signals, was used to test the system. Ten participants individually performed each gesture twice as discrete trials, with a brief rest period between each trial. The average recognition rate was 68%. The highest average recognition rate for an individual was 86%; the lowest was 57%. Three of the 14 gestures were always recognized correctly, and one was never recognized correctly. While no tracking failures occurred for four of the gestures, tracking failures ranged from 10% to 100% for the other ten. The system's capabilities for untagged optical tracking and recognition of gestures involving certain types of repetitive motion advance the state-of-the-art in computer-based gesture recognition. However, for training applications, substantial improvements are needed in tracking reliability and recognition of gestures involving the depth dimension.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA408459>

RN 2003-07

Toward an Understanding of Team Performance and Team Cohesion over Time through the Lens of Time Series Analysis. (2003). McIntyre, R.M., Strobel, K., Hanner, H., Cunningham, A., & Tedrow, L. (DTIC No. ADA409456).

This final report summarizes the results of two phases of research involving the effects of theory-based teamwork training on team cohesion and team performance. In the first phase, the research used a relatively straightforward pre-training, post-training, and post-post-training design to determine the effects of theory-based teamwork process training on team cohesion. Results indicated significant and reasonably long-lasting effects on team cohesion as measured by the System for the Multiple Level Observation of Group (SYMLOG) measurement system. The second phase of the research was extremely labor intensive. It involved the use of 11 student teams who participated in an advanced undergraduate psychology course. A somewhat surprising finding was that team performance and team cohesion were not related as expected. The four studies in two phases provided more questions than answers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA409456>

RN 2003-08

U.S. Army Research Institute Research and Technical Publications: FY 2002. (2003). (DTIC No. ADA419849).

The means of dissemination of the results of ARI's research and development/studies and analysis program vary widely depending on the type of work, the subject matter, and the sponsor/proponent. Typically, major findings with immediate policy and procedural implications are briefed to sponsors and proponents in order to enable timely implementation. This is followed up with complete documentation in the form of research and technical publications such as the ones listed here. In many cases, these documents represent the actual item handed off to the sponsor/proponent; this is particularly true of the

Research Product category. In other cases, results are published in order to provide a complete record of the work done and for future reference by researchers doing work in the same or similar areas. This annotated list for FY 2002 provides an idea of both the depth and scope of the ARI research effort, and is a valuable resource for anyone interested in military psychology from either a scientific or operational perspective.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419849>

RN 2003-09

Assessment of Right Conduct Administrator's Manual. (2003). Kilcullen, R.N., White, L.A., Sanders, M.G., & Hazlett, G. (DTIC No. ADB288364 / Restricted).

RN 2003-10

Virtual Environment Cultural Training for Operational Readiness. (2003). Weiland, W.J., Deaton, J., Barba, C.A., & Santarelli, T.P. (DTIC No. ADB288647 / Restricted).

RN 2003-11

Measurement Methods for Human Performance in Command and Control Simulation Experiments. (2003). Sanders, W.R. (DTIC No. ADA413273).

The U.S. Army's proposed Future Combat System of Systems (FCS) will include automated Command and Control (C²) capabilities that will allow tactical commanders, assisted by a small command group, to effectively lead a future force composed of large numbers of manned and robotic elements. This paper describes research conducted by the U.S. Army Research Institute (ARI) to develop measurement methods to enhance the existing Human Functional Analysis (HFA) approach (Sanders, Lickteig, 2002) for estimating human performance requirements associated with FCS C² design concepts. Measurement techniques are demonstrated that can address C² human performance requirements through the evaluation of verbal communications, Human-Computer Interaction (HCI) behavior events, and subjective survey data. Specifically, automated word count, and task-time estimation methods were applied to existing HFA data sets to provide estimates of the frequency and time duration of verbal communications for individual members of the FCS C² command group, and task time estimates for all HCI actions. Data gathered in a series of U.S. Army battle simulation experiments were reanalyzed to demonstrate how the new methods can provide estimates of human performance that support decisions regarding workload, task allocation, and training requirements.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA413273>

RN 2003-12

Gender Integration of Basic Combat Training and Career Intent of Enlisted First Term Soldiers. (2003). Lee, J.K., & Tremble, T.R. (DTIC No. ADA415813).

Past findings summarized by Mottern, Foster, Brady, and Marshall-Mies (1997) have supported the conclusion that the gender-integrated approach to training does not adversely influence the basic-training performance of either female or male Soldiers. The research here investigated differences between Soldiers with single gender or gender-integrated basic training in their career intentions and Army adaptation over the full course of initial entry training (IET), that is, basic and advanced entry training. Analyses of variance revealed that differences by type of training and Soldier gender were relatively small but tended to indicate more positive outcomes for the Soldiers (males and females) having had gender-integrated basic training. Despite a slight decrease over time, responses at the end of IET remained positive, and the decline in adaptation tended to be less frequent for males with gender-integrated basic training. In general, the attitudes of Soldiers in different training environments were similar and showed similar changes over time. Thus, the overall pattern supports earlier conclusions (Mottern et al., 1997; Harrell & Miller, 1997) and suggests that over the full course of IET, the gender integration of basic training is not associated with more negative effects in terms of the career intent or adaptation of male or female Soldiers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415813>

RN 2004-01

U.S. Army Research Institute Program in Basic Research: FY 2002 – FY 2003. (2003). (DTIC No. ADA418333).

This document contains detailed summaries for each of the U.S. Army Research Institute's basic research contracts for the fiscal years 1998 - 2003. These summaries are grouped according to three Basic Research Office program objectives: Providing fundamental knowledge to improve training in

complex, digital environments; providing fundamental knowledge to improve leader assessment and accelerate leader development; and providing fundamental knowledge for identifying and measuring the attributes and skills that are critical to Soldier recruiting, performance, and retention in the transforming Army. In addition to summarizing what was done or is being done, each summary also describes the contributions of that research effort to basic behavioral science and suggests how the findings might benefit the Army and other military services.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA418333>

RN 2004-02

Social and Cultural Dynamics of American Military Organization. (2004). Segal, D.R. (DTIC No. ADA419659).

This report reviews a program on military organization conducted during the last five years of the twentieth century. The collapse of the Soviet Union and the Warsaw Treaty alliance and the involvement of the American Military in operations other than war in coalition with other nations, defined the international context of this period. A full-employment economy and increasing levels of college attendance among American youth characterized the domestic environment. The research program focuses on six areas. 1) Attitudes and behavior of youth, including patterns, trends, and correlates of enlistment propensity and the relationship between propensity and enlistment. 2) Adaptation of Soldiers to the military and to participation in peacekeeping operations. 3) Military families, including family adaptation to separation during deployment, communication between forward deployed Soldiers and the home front, and family adaptation to disaster. 4) Gender diversity, including gender integration, sexual harassment, and the effect of gender on enlistment propensity. 5) Comparative research, including national differences in organizational adaptation to the end of the Cold War in Europe. 6) The intersection of the military and American society, including the impact of service on the civilian adaptation of veterans, and the economic impact of military bases on their host civilian communities.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419659>

RN 2004-03

International Military Education and Multinational Military Cooperation. (2004). Moskos, C. (DTIC No. ADA419747).

The core thesis is that American military officers can play a key role in countering incipient and overt perceptions of American arrogance. This report is based on interviews with international officers (IOs) at American war, command and staff colleges in each of the service who participate in International Military Education and Training (IMET). Overall, the level of multinational cooperation is remarkable. At the IMET level, recommendations include: (1) make medical insurance available for family members of all foreign officers; (2) decrease the classified material unavailable to IOs because of security classifications; (3) add more curriculum content on multinational operations; (4) be alert to the unique status of Arab IOs; and (5) make more effort to incorporate the spouses of IOs into the American social scene. Regarding multinational headquarters, recommendations include: (1) some use of non-English phrases in social interaction with IOs; (2) avoid speaking too quickly or using acronyms that are not familiar; (3) be alert to the stereotype of Americans as having a "zero-defects" or "check-point" mentality and an obsession with work; (4) encourage more cross-national informal activities; (5) read something about the home country of a fellow IO; and (6) rethink the career paths of Foreign Area Officers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419747>

RN 2004-04

Personnel Stabilization and Cohesion: A Summary of Key Literature Findings. (2004). Smith, M.D. & Hagman, J.D. (DTIC No. ADA421092).

Reviewed U.S. military-related research to (a) determine the effects of personnel stabilization on unit cohesion, and (b) identify conditions/factors found to either mitigate these effects or benefit from them. Consistent support was found for the sequential linkage of Personnel Stability → Bonding → Cohesion → Desirable Outcomes. Personnel stability promotes bonding processes that set the stage for the development of horizontal (Soldier to Soldier), vertical (Soldier to leader and vice versa), and organizational (Soldier/leader to the Army) cohesion. Cohesive units, in turn, consistently demonstrate enhanced performance across a broad array of outcome measures. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA421092>

RN 2004-05

Promoting Realistic Self-Assessment as the Basis for Effective Leader Self Development. (2004). Cortina, J., Zaccaro, S.J., McFarland, L., Baughman, K., Wood, G.M., & Odin, E. (DTIC No. ADB298034 / Restricted).

RN 2004-06

Government Performance and Results Act Report: FY 2003. (2004). (DTIC No. ADB299158 / Restricted).

RN 2004-07

U.S. Army Research Institute Research and Technical Publications: FY 2003. (2004). (DTIC No. ADA424163).

The means of dissemination of the results of ARI's research and development/studies and analysis program vary widely depending on the type of work, the subject matter, and the sponsor/proponent. Typically, major findings with immediate policy and procedural implications are briefed to sponsors and proponents in order to enable timely implementation. This is followed up with complete documentation in the form of research and technical publications such as the ones listed here. In many cases, these documents represent the actual item handed off to the sponsor/proponent; this is particularly true of the Research Product category. In other cases, results are published in order to provide a complete record of the work done and for future reference by researchers doing work in the same or similar areas. This annotated list for FY 2003 provides an idea of both the depth and scope of the ARI research effort, and is a valuable resource for anyone interested in military psychology from either a scientific or operational perspective.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA424163>

RN 2004-08

Development of Recruiter Assessment Measures for the U.S. Army. (2004). Borman, W.C., Horgen, K.E., Birkeland, S.A., Penney, L.M., Sutton, M.J., Mills, L.J., White, L.A., & Bowles, S. (DTIC No. ADA425937).

This report describes the important performance requirements of the Army recruiter job and provides a review of assessment and training practices in the current Army Recruiter Course (ARC), as well as applicable practices in the private sector. It reviews several areas of strength and opportunities for improvement in the ARC. In addition, the report describes how a research foundation for an integrated ARC assessment system may be developed at the Recruiting and Retention School. Finally, three products were developed to assist USAREC in their efforts to develop tools for the training and development of recruiters, the Army Recruiter Performance Rating Scales, a Situational Judgement Test (SJT), and a recruiter in-basket simulation exercise.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA425937>

RN 2004-09 — Cancelled**RN 2004-10**

Development of a Conditional Reasoning Measure of Team Orientation. (2004). O'Shea, P.G., Driskell, J.E., Goodwin, G.F., Zbylut, M.L., & Weiss, S.M. (DTIC No. ADA427947).

This paper describes a two-year effort to develop a measure of personality-based team orientation using conditional reasoning (CR). A model of team orientation is proposed and the conditional reasoning testing methodology is reviewed. This paper recounts the test development and validation efforts surrounding two CR tests. Although validation efforts indicated that the tests did not achieve acceptable validity and reliability coefficients, individuals who wish to construct CR tests may find the section of "lessons learned" to be particularly helpful.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA427947>

RN 2005-01

The Virtual Observer / Controller: Automated Intelligent Coaching in Dismounted Warrior Simulations. (2004). Banta, H.G., Troillet, D.B., Heffernan, N.T., Plamondon, B., & Beal, S.A. (DTIC No. ADA429445).

This report describes the efforts and results of examining the feasibility of creating a Virtual Observer/Controller (VOC) to observe and critique Soldiers' performance as they are engaged in

simulated small-unit, dismounted infantry training using the Soldier Visualization System (SVS) at Fort Benning, Georgia. The successful integration of these two technologies will mean that the training value of the simulation-based exercises will not be completely dependent on the military expertise of a human observer/controller. Investigating the development of the VOC required several major efforts: (a) identifying the Soldier behaviors that merit performance evaluations; (b) developing situation triggers in the context of a training scenario that stimulate the Soldier behaviors we wish to observe and to evaluate; (c) determining how to detect those behaviors in an automated fashion, and; (d) developing instructional strategies that can adequately respond to both individual actions and small-unit collective behaviors.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA429445>

RN 2005-02

Digital C³ Systems: Potential for Sharing Lessons Learned Across Services. (2004). Barnett, J.S. (DTIC No. ADA429414).

This research project investigated digital command, control, and communications (C3) systems of the U.S. military services to find information which could be used to help integrate U.S. Army digital C3 systems into digital units. The first part of the project identified key elements of U.S. Army digital systems and used these elements to identify similar systems in the U.S. Navy, U.S. Air Force, U.S. Marine Corps, and civilian services such as police, fire or emergency services. Once similarities were identified, the next step was to collect information on lessons learned, best practices, training, and research which would be relevant to U.S. Army digital systems. The results found that few digital C3 were similar to U.S. Army systems, and most are still under development. The only systems which had close similarities with U.S. Army digital systems were tactical-level systems used by the U.S. Marine Corps. Consequently, agreements have been made to share research and development products between the U.S. Army and the U.S. Marine Corps.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA429414>

RN 2005-03

U.S. Army Research Institute Research and Technical Publications: FY 2004. (2005). (DTIC No. ADA524417).

The means of dissemination of the results of ARI's research and development/studies and analysis program vary widely depending on the type of work, the subject matter, and the sponsor/proponent. Typically, major findings with immediate policy and procedural implications are briefed to sponsors and proponents in order to enable timely implementation. This is followed up with complete documentation in the form of research and technical publications such as the ones listed here. In many cases, these documents represent the actual item handed off to the sponsor/proponent; this is particularly true of the Research Product category. In other cases, results are published in order to provide a complete record of the work done and for future reference by researchers doing work in the same or similar areas. This annotated list for FY 2004 provides an idea of both the depth and scope of the ARI research effort.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA524417>

RN 2005-04

Preparing and Submitting Scientific and Technical Manuscripts and Other Documents for Publication. (2005). (DTIC No. ADA443857).

The purpose of this ARI regulation is to define responsibilities and provide procedures for archiving technical and research documents and the submission of technical manuscripts for publication. This guidance applies to ARI and contractor personnel who produce and submit technical documents for publication or archiving by ARI. It is based on the former ARI Regulation 70-3 and incorporates all subsequent supplementary materials, guidance, and procedure and policy changes.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA443857>

RN 2006-01

Station Commander Job Analysis and Preliminary Test Validation Results. (2005). Horgen, K.E., Kubisiak, U.C., Connell, P.W., White, L.A., Bruk-Lee, V., Penney, L.M., Borman, W.C., & Kaufman, J.D. (DTIC No. ADA440172).

This report describes the important performance requirements of the Army recruiting station commander job and reviews the personal characteristics likely to predict station commander performance. Two measures of station commander performance were developed, the Station Commander Performance

Rating Scales and the Station Mission Achievement Index. These two measures were used as criteria in a preliminary validation effort to predict station commander performance using personality, biodata, and other measures. This report describes the results of, and provides recommendations based on this preliminary validation work.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA440172>

RN 2006-02

Influences of Work Life Support of Officers' Organizational Commitment and Negative Work Family Spillover. (2006). Gibson, J.L & Tremble, T.R. (DTIC No. ADA446707).

When Soldiers leave military service, the loss decreases the personnel available for operational missions. Consequently, a continued concern of the Army is to understand processes leading to Soldier retention and attrition. Given the large body of research showing that employees' organizational commitment is derived from their perceptions of the extent to which the employer is committed to and supportive of them, assistance with balancing the demands of work and family life is a promising intervention for improving Soldier experiences and increasing retention in the Army. This research examined the continuance of junior Army officers as it relates to benefit use, social support perceptions, and control over work-family issues. Hypotheses were based on principles of social support and the need for personal control. Results provided partial support for the process by which benefits are construed as support, which increases affective commitment, and the process by which benefits increase personal control, which decreases negative work-family spillover. Interestingly, benefit use was positively related to increased control over the work-family interface and increased resource dependence, which is characterized by dependence on others for their support and may be construed as surrendering some degree of control. Implications of these findings are discussed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA446707>

RN 2006-03

U.S. Army Research Institute Research and Technical Publications: FY 2005. (2006). (DTIC No. ADA452089).

The primary responsibility of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is to maximize Soldier effectiveness. ARI accomplishes its mission through research and development in the acquisition, training, utilization, and retention of Army personnel. ARI research and products affect every Army mission with a human performance component. As convenient references for qualified agencies and individuals and sponsors, ARI publishes lists of its technical and research publications. This issue of the publication list describes reports published during FY 2005. It contains the abstract of each publication and the bibliographic information needed to identify a publication. The abstracts have been written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is used to communicate efficiently the details of research analysis. Author and subject indexing provide access to individual reports and topics.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA452089>

RN 2006-04

Reanalysis of Validation of Tool to Assess Readiness for Online Learning. (2006). Le, H.A., Sager, C.E. & Young, M.C. (DTIC No. ADA452076).

Data originally collected to validate a questionnaire measuring Soldiers' readiness to attend the eArmyU were reanalyzed. eArmyU is a portal to online college level courses offered by a consortium of universities. The current study applies analytical procedures that provide methodological improvements to the original analysis. Specifically, exploratory and confirmatory factor analyses were sequentially used to select items and establish construct validities of the resulting scales. Next, a linear-based approach was applied to examine the scales' criterion-related validity. Scales measuring five theoretically relevant constructs – Motivation/Self-Determination, Intolerance of Ambiguity, Performance Goal Orientation, Need for Social Interaction, and Study Skills/Conscientiousness – were constructed from 53 items of the 90 original items. The scales have good psychometric properties and can reasonably predict the criterion of interest (multiple *R* adjusted for shrinkage is .23). Recommendations for future research that would further support the use of the questionnaire are made.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA452076>

RN 2007-01

The Relation Between Group Level Characteristics and Group Cohesion. (2006). Salo, M. (DTIC No. ADA460547).

This research examined the differences in cohesion among platoons in the Finnish conscript service and the relations between platoon cohesion and an array of outcome criteria. Data were collected from records and by questionnaires given to 514 platoon members in 21 platoons near the end of their 6 to 12 months of conscript training. Results showed that mean expected and rated performance, mental state, sense of personal growth, social skills aptitude, attitudes toward refresher training and national defense, and good conduct were related overall to strong platoon mean perceived cohesion. Platoon size was not significantly related to cohesion. The different cohesion components (peer, leader, organizational, and institutional bonding) were related differently to various predictor and outcome variables.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA460547>

RN 2007-02

The Army Science of Learning Workshop. (2007). Quinkert, K.A., Morrison, J.E., Fletcher, J.D., Moses, F.L., & Roberts, E.J. (DTIC No. ADM001922 / CD-ROM).

At the request of TRADOC, ARI brought together key stakeholders in Army training and education together with experts from academia, industry, and other Military Services for a 3-day workshop. The purpose of this workshop was to identify learning science findings and technologies to help the Army train Soldiers and grow leaders for today and tomorrow. Ninety-five individual workshop participants were divided into four working groups that discussed four distinct problems in training. The following are some of the more notable findings and recommendations from those four working groups: (a) Learning Model—try out an instructional development and execution strategy that is grounded in the science of learning; (b) Develop Leaders—integrate social networks, communities of practice, and Army Knowledge Online (AKO) as an electronic supplement to socialization and relationship building; (c) Train Soldiers—use distance learning (dL) to accelerate training, reduce costs and personnel requirements and to improve operational effectiveness without adversely affecting Soldiers or their families; and (d) Future Capabilities—maintain a robust agenda of multidisciplinary research to include (but not be limited to) the following general topic areas: learning and performance, social and cultural behavior, human-machine performance, predictive models of readiness and performance, and collective performance modeling.

RN 2007-03

Collaboration and Self-Assessment: How to Combine 360 Assessments to Increase Self Understanding. (2007). Psotka, J., Legree, P.J., & Gray, D.M. (DTIC No. ADA467418).

Traditional performance appraisal measures are generally one sided and lack the ability to deliver accurate objective feedback. 360 assessments provide a collaborative tool for professional development utilizing superior, peer, subordinate, and self-assessments to create a more balanced circle of feedback. Traditionally self-ratings have been found to be less correlated than peer and superior ratings with performance measures. In general peer and superior ratings are more highly correlated than self and peer, or self and superior. By utilizing an objective measure of tacit leadership knowledge, the TKML, we compared self-ratings to peer and superior ratings through a factor score. Given this new measure, correlations with superior and peer ratings were improved. However, subordinate ratings were found to be negligible. Self-ratings were found to have a stronger correlation with leadership ability than peer or superior ratings and therefore were found to be the most reliable assessment of leadership ability. Additional regressions combining the 360 ratings yielded the strongest correlations with the TKML. Self-appraisals should draw on our knowledge of ourselves and the perspectives that others provide for us.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA467418>

RN 2007-04

U.S. Army Research Institute Research and Technical Publications: FY 2006. (2007). (DTIC No. ADA472092).

ARI publishes lists of its technical and research publications as a convenient reference for qualified agencies and individuals and sponsors. This issue of the publication list describes reports published during FY 2006. It contains the abstract of each publication and the bibliographic information needed to identify a publication. The abstracts have been written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is used to communicate efficiently the details of research analysis. Author and subject indexing provide access to individual reports and topics.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA472092>

RN 2007-05

SamePage: Development of a Team Training Tool to Promote Shared Understanding. (2007). Spiker, V.A., Holder, E.W., Walls, W.F., Campsey, W.M., & Bruce, P.D. (DTIC No. ADA470896).

This research note describes the work conducted under a Phase II SBIR contract in which an online team training system called SamePage was created. The goal of SamePage is to promote the development of knowledge and skills for enhancing shared understanding within a team. The training begins with individualized online training designed to help trainees learn about shared understanding concepts. Once trainees have been exposed to basic principles of shared understanding, they work together as a five-person team through an online scenario-based exercise to practice the principles learned during individualized instruction. The scenario exercise is periodically halted so that an instructor can bring the group together into roundtable discussions to talk about team processes and shared understanding concepts. Portions of SamePage were tested in a formative evaluation with battalion-level staff, and reactions to the system were generally positive. Six lessons learned about constructing online team-based training are presented in the last section of this note.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA470896>

RN 2007-06

Annotated Bibliography: Research on Enlisted Attrition in the U.S. Army. (2007). Jennings, E., & Babin, N.E. (DTIC No. ADA470816).

The purpose of this annotated bibliography is to provide a resource for the study of Soldier attrition, with a focus on the Active enlisted component of the U.S. Army. These annotations include descriptions of the published literature on attrition from 1980 through the present. This annotated bibliography is intended to gather the many research efforts that have been conducted over the years into a single source. This source may provide a base for those who are continuing ongoing research or are beginning new attrition research. It can be used as an overview of methods and statistics utilized over the years, or a summary of the findings and results of the many pieces of research. The primary focus of this bibliography is on enlisted attrition in the Active component of the U.S. Army. Bibliographic references to research or literature on the Army Officer Corps and the Reserve Component (including the Army National Guard) were not included. Each component of the Army has its own unique structure, standard, and policies, and therefore, it cannot necessarily be assumed that attrition models of one component are easily transferable to or generalized to another. Furthermore, each component of the Army has its own set of complexities that make generalization risky.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA470816>

RN 2007-07

Training Exemplars for Visualizing Time and Space at Company and Platoon Level. (2007). Sidman, J., & Garrity, M.J. (DTIC No. ADM002032 / CD-ROM).

Success in military operations increasingly rests on the ability of small units to counter asymmetric threats in the varied and foreign urban settings that typify the contemporary operating environment. However, the physical dimensions and cultural characteristics of urban environments dramatically compress and complicate the dynamics of space and time so fundamental to visualizing and executing company and platoon operations. A cognitive task analysis (CTA) was conducted to identify training requirements for limited prototype training development. The CTA underscored the need for visualization training in small units and identified a related set of training principles and associated techniques. On that basis, prototype examples of visualization training were developed in five modules that feature scenario-based contexts, multimedia delivery, and deliberate practice. The prototype training examples are provided to guide future development of visualization training at the small unit level.

RN 2007-08

Heuristic Evaluation of a User Interface for a Game Based Simulation. (2007). Jerome, C.J., Howey, A.M., & Billings, D.R. (DTIC No. ADA475400).

This research sought to estimate the level of usability, to identify any problem areas, and to provide redesign recommendations that may improve the usability of future designs of Forterra's Online Interactive Virtual Environment (OLIVE) system as a training tool. Game interface usability might have an effect on the success of game-based simulation training programs. Three usability researchers performed a usability heuristic evaluation, documenting each problem identified, as well as the recommended solution to these problems. Three areas out of the ten usability heuristics were identified as potentially problematic: User Control and Freedom Recognition, Recognition Rather than Recall, and

Help and Documentation. A number of design recommendations have been identified which should improve usability and task performance using these systems. The data can serve to enhance the existing software by incorporating additional program requirements, and can also provide an easy-to-use checklist for DoD personnel, private contractors, and researchers interested in the design and testing of game-based simulation for team training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA475400>

RN 2008-01

A Cost-Benefit Analysis Applied to Example Proposals for Army Training and Education

Research. (2008). Morrison, J.E., Fletcher, J.D., Moses, F.L., Roberts, E.J., & Quinkert, K.A. (DTIC No. ADA477190).

The report was based on outcomes from the Army Science of Learning Workshop sponsored by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) at the request of the U.S. Army Training and Doctrine Command (TRADOC). The present report took findings from the workshop and derived a research and development (R&D) program. The elements of the current analysis were 21 proposed R&D efforts derived from concepts discussed in the workshop. Total costs were calculated in two ways: (1) implementation and other costs were summed to estimate the first-year start-up (Y1) costs; and (2) long-term costs were calculated by adding maintenance to Y1 estimates, assuming a five-year time frame. The benefit of a proposed R&D effort was conceived as analogous to expected value that is, an estimate of the work's operational impact multiplied by the probability of successfully executing the work. These data were used to derive three types of proposal packages: (1) an optimal package that maximizes benefit and minimizes costs, (2) a package having a fixed budget that maximizes total benefit, and (3) a package for a stated level of benefit that minimizes costs. The analyses provided sensible alternative plans for a TRADOC R&D program.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA477190>

RN 2008-02

Relations between Select²¹ Predictor Measures and First Term Attrition. (2008). Putka, D.J., & Bradley, K.M. (DTIC No. ADA478180).

This report is based on a research effort concerned with Soldier accession and job classification and New Predictors for Selecting and Assigning Future Force Soldiers (Select21). The goal of Select21 is to ensure the Army acquires Soldiers with the knowledge, skills, and attributes (KSAs) needed for performing the type of tasks envisioned in a transformed Army. The objectives of the project are to (a) identify Future Force job demands and pre-enlistment KSAs required to meet them, (b) develop measures of job performance and critical KSAs, and (c) validate the experimental predictor measures against valued criteria. This report summarizes attrition-related findings for Soldiers who participated in three Select21 reception battalion data collections: the pilot test (- 2003), faking research (- 2004), and field test (- 2004). The report provides estimates of the criterion-related validity of early estimates for pre-concurrent validation versions of the Select21 predictor measures for predicting first-term attrition. As such, the results provided in this report speak to the potential of the measures for selecting future Soldiers who are likely to complete their service obligations.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA478180>

RN 2008-03 — Cancelled

RN 2008-04

U.S. Army Research Institute Research and Technical Publications for Public Distribution: FY 2007. (2008). (DTIC No. ADA481845).

ARI publishes lists of its technical and research publications as a convenient reference for qualified agencies and individuals and sponsors. This issue of the publication list describes reports approved for public release during FY 2007. It contains the abstract of each publication and the bibliographic information needed to identify a publication. The abstracts have been written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is used to communicate efficiently the details of research analysis. Author and subject indexing provide access to individual reports and topics.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA481845>

RN 2008-05

Training for Rapid Interpretation of Voluminous Multimodal Data. (2008). Folds, D.J., Blunt, C.T., & Stanley, R.M. (DTIC No. ADA480514).

Previous research has not specifically addressed rapid decision-making based on large amounts of data, although a large body of research has identified various biases and characteristic errors in human decision making that promote economy of information processing. The purpose of this series of experiments was to determine whether seven known characteristic error types operate in rapid decision-making, and to determine whether training to identify key contexts in which these errors are likely to occur can reduce their occurrence. Student volunteers across four experiments performed a simulated incident detection task using information in a variety of formats. Results supported the primary hypothesis that each of seven types of characteristic errors of interest occur in rapid decision-making. A reduced tendency to commit false alarms occurs as a result of general alerting to the presence of error traps, although individuals who received specialized training to reduce the occurrence of characteristic errors performed no better than a control group. Team task performance greatly reduced undesirable false alarm errors, but also reduced desirable incident hits. Teams that received training reported the fewest hits and errors, although it was unclear whether this was a result of training or the effect of alerting observed in individuals.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA480514>

RN 2008-06

U.S. Army Research Institute Research and Technical Publications for Restricted Distribution: FY 2007. (2008). (DTIC No. ADB339026 / Restricted).

RN 2008-07

Evaluating the O*NET Occupational Analysis System for Army Competency Development: Supplemental Appendices. (2008). Russell, T.L., Sinclair, A., Erdheim, J., Ingerick, M., Owens, K.S., Peterson, N., & Pearlman, K. (DTIC No. ADA493578).

The present evaluation focused primarily on the usefulness of the O*NET system for Army occupational analysis for selection and classification purposes. The evaluation focused on the appropriateness of O*NET descriptors that would typically be used in an Army occupation analysis for selection and classification purposes: abilities, skills, generalized work activities [GWAs], and work context. Four civilian and four officer occupations were selected for this research. The objective was to produce data for the military occupations that could be compared to civilian O*NET data. Therefore, it was important to follow processes currently used by O*NET for data collection. In effect, this meant collecting information on occupational tasks, abilities skills, GWAs, and work context from Army Subject Matter Experts (SMEs) and collecting ability and skill ratings using trained analysts. The results showed that Army SMEs as well as other types of analysts could make reliable ratings on the O*NET descriptors. Potential uses for the O*NET descriptors are discussed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA493578>

RN 2008-08

An Evolutionary Game Theory Model of Revision Resistant Motivations and Strategic Reasoning. (2008). DeLancey, C. (DTIC No. ADA493545).

Strong reciprocity and other forms of cooperation with non-kin in large groups and in one-time social interactions is difficult to explain with traditional economic or with simple evolutionary accounts. Reciprocity can be costly, while in many instances earning little or no benefit to the individual or its kin. In Ultimatum Games, for example, humans tend in one-shot anonymous interactions towards equal distributions of goods at high individual cost, often encouraged through retributive actions that result in significant personal cost. In this research, an agent-based genetic algorithms model is used to show that in a game similar to the Ultimatum Game, and of which an Ultimatum Game could be interpreted as a subgame, but where the past history of an agent's retributive actions is visible to other agents, strategies exhibiting strong reciprocity can evolve. This model is notable for its conservatism: It presupposes no special features in the structure of the population, relies solely upon potential benefits to kin and offspring, and requires only punishment (and not also reward) as an explanation of the behavior. The model also is consistent with a number of findings on the nature of emotions and related forms of motivation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA493545>

RN 2009-01

The Impact of Extending the Special Forces Warrant Officer Service Obligation on the Recruitment and Accessioning of Special Forces Warrant Officers. (2009). Kilcullen, R.N., & Lussier, J.W. (DTIC No. ADA495035).

This research assesses the potential impact of increasing the U.S. Army Special Forces (SF) Warrant Officer (WO) service obligation from six to 10 years on SF Noncommissioned Officer (NCO) interest in applying to become SF WOs. A survey was administered to 293 SF NCOs to assess their attitudes toward applying to become a WO under the current system and under a system in which the WO service requirement was increased from six to 10 years. A separate survey was completed by 98 SF WOs to provide information on how a longer WO service requirement would have affected their decision to apply. An analysis of both surveys suggests that increasing the WO obligation from six to 10 years will result in fewer WO applications. A rough estimate is that the number of applications will drop by 50% if the 10-year obligation is introduced without compensatory incentives. The right package of incentives along with an extended obligation may result in roughly a 25% drop in applications. The incentive package should include financial incentives and options for longer service on Operational Detachment Alpha (ODA) to be maximally effective. The WO recruiting efforts can be maximized by focusing on sergeant first class (SFC) and those with 11-15 Years of Service (YOS), excluding 18Es. Follow-up surveys and/or focus groups can be conducted to better specify the precise level of financial and other incentives necessary to achieve the desired impact.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA495035>

RN 2009-02

Culturally Aware Agents for Training Environments. Phase 1. (2009). Reilly, S.N., Bayley, C., Koelle, D., Marotta, S., Pfautz, J., Keeney, M., & Singer, M.J. (DTIC No. ADA495036).

Recently, the U.S. Army has conducted a wide range of missions within the context of very different cultures and languages. These missions often require junior leaders and Soldiers to interact and communicate effectively with people whose cultures, languages, lifestyles, and beliefs are very different from those found in the U.S. Computer-based training in virtual environments has the potential to train Soldiers to rehearse missions with a sound knowledge of the relevant local cultural context. Existing computer simulations of culturally situated agents representing humans are currently very limited in fidelity, making them unsuitable for training and rehearsal. This effort investigated, designed and demonstrated the feasibility of a two-step approach addressing the modeling of believable cultural agents. First, a mission essential competencies approach identifies key skills needed in training. Second, a modeling toolkit for designing computer-controlled agents for cultural training applications was described. The approach uses social network modeling technologies to develop models of interconnected agents within a graphical environment and a human behavior-modeling tool for simulated agents based on the cultural context. This approach was demonstrated by developing an integrated prototype that dynamically created cultural behavior in a virtual environment.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA495036>

RN 2009-03

Analysis of Army Reserve Clinician Willingness to Accept Varying Lengths of Deployments / Mobilizations. (2009). Babin, N.E. (DTIC No. ADB347306 / Restricted).

RN 2009-04

User Guide to the Enlisted Personnel Allocation System Software with System Documentation. (2009). Sticha, P.J., & Smith, G.W. (DTIC No. ADB347332 / Restricted).

RN 2009-05

Training Collaboration in a Network Assisted Environment. (2009). Schaab, B.B., Dressel, J.D., Sabol, M.A., & Lassiter, A.R. (DTIC No. ADA497060).

This report investigates the effects of continuous vs. discrete control methods and the number of simultaneous camera views on operator performance during training to manually control a simulated micro-unmanned aerial vehicle (MAV). Seventy-two participants were trained to operate a MAV in a simulated environment, to designated criterion levels. They were then given training missions during which performance was measured. Eight conditions were investigated, formed by crossing three 2-level factors: input device (mouse vs. game controller), input control display (discrete vs. continuous), and number of simultaneous camera views (one vs. two). Superior performance was observed when a continuous input method (e.g., multiple degrees of freedom) was provided for continuous MAV functions

(e.g. maneuvering in space) and a discrete input method (e.g., single action) was provided for discrete MAV functions (e.g., command to hover). Under these conditions, mission times were shorter, collisions were fewer, and more targets were photographed. Effects of video game experience and spatial ability were also investigated. Recommendations for the design of unmanned vehicle controls were discussed. <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA497060>

RN 2009-06

Army Redeployment Survey 2007 – 2008: Final Results. (2009). Milan, L.M. (DTIC No. ADB348045 / Restricted).

RN 2009-07

The Human Dimension of Advising: Descriptive Statistics for the Cross-Cultural Activities of Transition Team Members. (2009). Zbylut, M.L., Metcalf, K.A., McGowan, B., Beemer, M., Brunner, J.M., & Vowels, C.L. (DTIC No. ADA507716).

A survey targeting interpersonal, cultural, language, and advisory activities was administered to 565 Army and Marine advisors returning from Iraq and Afghanistan. Advisors rated how frequently they engaged in 151 activities, as well as indicated how important those activities were to advisor performance. This Research Note is a companion to ARI Technical Report 1248 (Ramsden Zbylut, Metcalf, McGowan, Beemer, Brunner, & Vowels, 2009), which presented analyses regarding the interpersonal, linguistic, advisory, and cultural activities performed by the 565 transition team advisors in the sample. This document is a supplemental appendix that presents the descriptive statistics for advisor activities within specific positions on military transition teams.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507716>

RN 2009-08

Learning to Decode Nonverbal Cues in Cross-Cultural Interactions. (2009). Samman, S.N., Moshell, M., Brathwaite, C., & Clark, B.R. (DTIC No. ADA507717).

Report developed under STTR Phase I contract for topic OSD07-T004. The overall objective of the project is to generate guidelines for the conceptual design of an interactive, computer-based training tool to improve Soldiers' ability to decode nonverbal cues and behavior in multiple channels (i.e., vocal tones, gestures). The tool will assist Soldiers to exhibit effective cross-cultural communication skills and prepare them to interpret and predict behavior more accurately in cross-cultural environments. The specific objectives of this Phase I research are to (1) conduct a comprehensive review to identify universal and culture-specific nonverbal cues that are particular to a specific Middle Eastern culture; (2) examine which nonverbal cues are more reliable across American and Arab cultures to determine similarities; (3) investigate which nonverbal cues and behaviors may be misinterpreted across cultures; (4) identify methods for teaching the recognition and interpretation of nonverbal cues cross-culturally; and (5) generate guidelines for the conceptual design of a training approach that is computer-based and interactive to improve Soldiers' ability to decode nonverbal cues and behavior. In Phase II, the development and testing of a prototype system in a realistic environment was to be undertaken.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507717>

RN 2009-09

Operational Assessment of Tools for Accelerating Leader Development. Volume 2: Appendices. (2009). Leibrecht, B.C., McGilvray, D.H., Tystad, D.L., & Garven, S. (DTIC No. ADA507718).

This report, in two volumes, describes the operational demonstration of an innovative toolkit designed to enhance self-development of junior leaders in the Army. The toolkit contains online diagnostic and training tools that build self-awareness, metacognitive abilities, critical thinking skills, and interpersonal skills. Volume I presents the body of the report including introduction to the demonstration, description of the toolkit, methods, findings and discussion, lessons learned, and conclusions and recommendations along with the references. This Volume II contains the appendices to the report. Presented are the planning documents that guided the development and execution of the research (Detailed Test Plan, Implementation Support Plan, and Student Guide) and examples of the manual data collection instruments. These appendices contribute to the understanding of this research effort as well as the findings, lessons learned and recommendations presented in Volume 1, Technical Report 1252. Further, the appendices provide valuable insights for researchers in future inquiries.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507718>

RN 2009-10

Mode Effects Analysis Summary Report: Sample Survey of Military Personnel – Fall 2007. (2009). Yang, Y.M., & Falcone, A.E. (DTIC No. ADB353730 / Restricted).

RN 2009-11

Internet Delivery of Captains in Command Training: Administrator's Guide. (2009). Shadrack, S.B., Fullen, T., & Crabb, B.T. (DTIC No. ADA507719).

In support of developing adaptive leaders, the research leading to this research note explored methods to implement an Internet-delivered version of the Captains in Command research product. Additional enhancements include student input tracking, data collection, and storage on a client side server. Original source video files were compressed to meet web standards and system requirements. Vignettes were posted to a server and tested for functionality and playability. The research note describes how to post files to a client side server and how to use the training product.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507719>

RN 2009-12

Training Soldiers to Decode Nonverbal Cues in Cross-Cultural Interactions. (2009). Rosenthal, D.B., Wadsworth, L.A., Elfenbein, H.A., Sanchez-Burks, J., & Ruark, G.A. (DTIC No. ADA507720).

The objective of this effort was to obtain information to increase Soldiers' ability to decode nonverbal cues (NVCs) in cross-culture interactions. Iraq was selected as the target location for this effort. We conducted a literature review, ran two focus groups with Soldiers, and videotaped Iraqi actors hired to display a series of emotions, actions, and gestures exhibited in Iraqi culture. The findings paint an unclear picture of the extent to which differences exist in NVCs between Americans and Iraqis and their impact on mission outcomes for U.S. Soldiers. The literature describes a strong universal element to nonverbal communication. However, more recent work also documents an in-group advantage. The Iraqi actors displayed some, but not many, gestures that are unlikely to be seen in the United States. U.S. Soldiers in our focus groups felt they were generally able to read most Iraqi's nonverbal behaviors. We recommend that future NVC research target specific, well defined contexts such as negotiations. We also recommend starting such efforts by carefully collecting and validating Iraqi culture-specific NVC. The final recommendation is to develop a training program that gives careful attention to the setting, training stimuli, practice and feedback, and training impact evaluation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507720>

RN 2009-13

Review of Interventions for Reducing Enlisted Attrition in the U.S. Military: An Update.

(2009). Kubisiak, U.C., Lentz, E., Horgen, K.E., Bryant, R.H., Connell, P.W., Tuttle, M.D., Borman, W.C., Young, M.C., & Morath, R.A. (DTIC No. ADA508188).

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) has been conducting research on first-term enlisted attrition as part of a broader research project entitled "STAY: Strategies to Enhance Retention." In support of the larger project, this report reviews past and ongoing interventions that support, directly or indirectly, attrition interventions that assist Army recruits, trainees, and Soldiers in completing training and their first-term enlistment. This report provides a review of attrition interventions that deal primarily with social and behavioral factors affecting first-term attrition since 1973, the time of the transition to the all-volunteer force. The review is based on a number of sources, including published articles, papers, technical reports, previous reviews, and briefings. In addition, Subject Matter Experts were contacted to supplement the published information with anecdotal reports and feedback about interventions. Based on these reviews, recommendations are provided to guide research on and development of future enlisted attrition interventions.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA508188>

RN 2009-14

Cultural Knowledge Training Modules for Army Special Operations Forces Soldiers. (2009).

Leibrecht, B.C., Lockaby, K.J., Perrault, A.M., & Strauss, C.P. (DTIC No. ADB353803 / Restricted).

RN 2009-15

Retention Incentives to Mitigate Deployment Effects on Soldier Retention. (2009). Ingerick, M., Allen, M.T., Weaver, E.A., Caramagno, J., & Hooper, A.C. (DTIC No. ADB353505 / Restricted).

RN 2009-16

Individual Differences of Potential Relevance to Social Awareness and Leader Influence. (2009). Parish, C., McGonigle, T.P., Martin, C., Mueller-Hanson, R.A., Swartout, E.C., & Garven, S. (DTIC No. ADB353926 / Restricted).

RN 2009-17

Review of Initiatives for Increasing Enlisted Reenlistment in the U.S. Army. (2009). Bryant, R.H., Tolentino, A., Borman, W.C., Horgen, K.E., Kubisiak, U.C., & Lentz, E. (DTIC No. ADA510824).

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) initiated a three-year research program titled "STAY: Strategies to Enhance Retention." The goals of this effort were to develop and test a conceptual model of the career continuance process, and to identify, implement, and evaluate promising interventions that encourage Army reenlistment among first-term Soldiers. To achieve these broad objectives, this report reviews past and ongoing interventions that support, either directly or indirectly, Army enlisted Soldier retention efforts. The review is based on a number of sources, including a literature search, interviews and focus groups with Army personnel, and anecdotal reports from subject matter experts. We also review the limited amount of research available that has evaluated the impact of Army initiatives on reenlistment decisions and related attitudes. The majority of initiatives discussed in this paper have not been formally evaluated, and the evaluations that do exist need updating. While this information adds to our knowledge about Army initiatives, more research is necessary. The Army would benefit from more recent research assessing whether relationships exist between use of specific Army programs or incentives and reenlistment intentions/decisions.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA510824>

RN 2010-01

Army 2008 Survey Nonresponse Analysis. (2009). Yang, Y.M., & Falcone, A.E. (DTIC No. ADB353561 / Restricted).

RN 2010-02

Decision Process to Identify Lessons for Transition to a Distributed Learning Instructional Format. (2009). Graves, T.R., & Bickley, W.R. (DTIC No. ADA509297).

The U.S. Army Infantry School, Office of the G-3, asked the Army Research Institute to evaluate the course content of 51 programs of instruction (n=2,065 lessons) for potential transition to a distributed learning instructional format. Using a mixed-method coding and analysis approach, the sample of POIs were categorized, coded, statistically analyzed, and a decision-process was developed to classify lessons into fully transitionable, partially transitionable or not transitionable groups. The thematic structure of course content types and the decision process may be adapted by related Army organizations seeking to evaluate their curricula for lessons that could be transitioned to a distributed learning format. Statistical analyses of the sample are provided as well as detailed appendices concerning the classification of the specific lessons in the sample.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA509297>

RN 2010-03

U.S. Army Research Institute Research and Technical Publications for Restricted Distribution: FY 2008. (2009). (DTIC No. ADB355672 / Restricted).

RN 2010-04

U.S. Army Research Institute Research and Technical Publications for Public Distribution: FY 2008. (2009). (DTIC No. ADA520967).

ARI publishes lists of its technical and research publications as a convenient reference for qualified agencies and individuals and sponsors. This issue of the publication list describes reports approved for public release during the period October 1, 2007, to September 30, 2008. It contains the abstract of each publication and the bibliographic information needed to identify a publication. The abstracts have been written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is used to communicate efficiently the details of research analysis. Author and subject indexing provide access to individual reports and topics.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA520967>

RN 2010-05

U.S. Army Research Institute Research and Technical Publications for Public Distribution: FY 2009. (2010). (DTIC No. ADA535423).

ARI publishes lists of its technical and research publications as a convenient reference for qualified agencies and individuals and sponsors. This issue of the publication list describes reports which are for public release/unlimited distribution during the period October 1, 2008 to September 30, 2009. It contains the abstract of each publication and the bibliographic information needed to identify a publication. The abstracts have been written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is used to communicate efficiently the details of research analysis. Author indexing provides access to individual reports.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA535423>

RN 2010-06

U.S. Army Research Institute Research and Technical Publications for Restricted Distribution: FY 2009. (2010). (DTIC No. ADB361114 / Restricted).

RN 2010-07

Mobile Learning Approaches for U.S. Army Training. (2010). Tucker, J.S. (DTIC No. ADA528742).

The purpose of this research was to review the current literature on mobile learning and identify potential approaches of incorporating smartphone technologies in Army training. Specifically, the research reports successful demonstrations of mobile learning outside of the Army and identifies potential challenges in using the technology in Army training. Thus, the report discusses the following areas: Definition and potential advantages of mobile learning; Demonstrations of using mobile technology in instructional environments; Potential approaches for Army training; A 5- to 10-year outlook; Challenges in using mobile learning technologies in Army training; and Conclusions and research questions.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA528742>

RN 2010-08

Development and Evaluation of a Video Designed to Enhance Officer Career Continuance. (2010). Mael, F.A., Alonso, A., Johnson, J.W., & Babin, N.E. (DTIC No. ADA530324).

The purpose of this research was to develop and evaluate an intervention designed to improve U.S. Army company grade officer career continuance. This intervention was a video featuring interviews with former officers to present their perspective on what aspects of the Army they miss in civilian life. We conducted focus groups with 155 current company grade officers to evaluate the ability of the video to influence career decisions and intentions toward staying in the Army. Between 15-29% of participants agreed with various post-viewing survey questions about the video changing different attitudes they had about the Army (e.g., appreciate aspects of being an officer that were taken for granted, more convinced they made the right choice by joining the Army), and over 45% said that the video helped clarify for them the unique benefits of being an officer. There was some degree of consensus from different sources that if the video was shown to officers who were at a decision point, if the showing of the video was accompanied by counseling by one's commander, and if the video was also shown to the spouse as a stimulus of much-needed conversation, that it could prove to be well worthwhile and possibly advantageous in retaining company grade officers.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA530324>

RN 2011-01

Integrating Adaptability into Special Operations Forces Intermediate Level Education. (2010). Ferro, G.A., Cracraft, M., & Beal, S.A. (DTIC No. ADA531622).

This report provides the results of a needs assessment and analysis of adaptability education at the Command General Staff College (CGSC), Fort Leavenworth, Kansas. It includes recommendations for modifications to the CGSC Special Operations Forces curriculum that are supported by a need to further develop adaptive leaders at the operational and strategic levels. The results, conclusions, and recommendations were drawn from information collected from recent CGSC Intermediate Level Education (ILE) graduates, current ILE students, instructors, course developers, and from the research literature on dimensions of adaptive performance. A set of instructional modules was developed from this assessment to enhance the ILE Special Operations Forces course content specific to developing, training, and promoting adaptability as a viable and necessary construct. In addition, we found that while

some of the material covered by the ILE curriculum relates to adaptability (e.g., the critical thinking and creative reasoning course), there is a need for a more focused effort on providing applied lessons and exercises that allow SOF officers to demonstrate adaptable skills under conditions that better represent current operational requirements.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA531622>

RN 2011-02

Improving the Trainee Socialization Process in Basic Combat Training. (2011). Cobb, M.G., Sluss, D.M., Muraca, S.T., Brown, B.A., Salter, M.S., & Rutti, R. (DTIC No. ADA535715).

During discussions with the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) in 2006, the Commanding General (CG), Ft. Jackson, requested that ARI determine what assimilation into the Army culture consists of, while developing and testing prototype methodologies, measurement instruments, and analytical strategies to ascertain which aspects of the Army socialization process are or are not succeeding. To address these concerns, a reliable set of metrics were developed to track attitude and value change at three points in basic training. Data were collected at Ft. Jackson, SC, and Ft. Benning, GA, during reception, near the end of BCT-White Phase (equivalent to the midpoint of OSUT), and just before graduation. Exploratory and confirmatory factor analyses were used in conjunction with repeated measures ANOVA and hierarchical linear regression to examine how new Soldiers' attitudes and relational identification change during basic training. Selected findings indicate: (1) basic training effects positive changes in Soldier attitudes regardless of variations in personality and other individual difference measures, (2) identification with Battle Buddies, Drill Sergeants, and their platoon significantly impacted Soldierization outcomes during basic training and changed as training progressed, and (3) by the end of basic training, the degree to which their DSs have modeled the Army's values and desired behaviors emerges as one of the most significant factors in the Soldierization process. These findings are discussed in terms of DS training tactics and the relationships that develop among Soldiers and between Soldiers and DSs during basic training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA535715>

RN 2011-03

U.S. Army Research Institute Research and Technical Publications for Public Distribution: FY 2010. (2011). (DTIC No. ADA542410).

ARI publishes bibliographies of its technical and research publications as convenient references for qualified agencies, individuals and sponsors. This listing describes reports with unrestricted distribution published during FY 2010, October 1, 2009 to September 30, 2010. The abstracts have been written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is often used to effectively communicate the details of research conducted. The bibliography includes bibliographic citations with abstracts, author indexing, and keywords.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA542410>

RN 2011-04

U.S. Army Research Institute Research and Technical Publications for Restricted Distribution: FY 2010. (2011). (DTIC No. ADB369709 / Restricted).

RN 2011-05

Development and Evaluation of a Career Continuation Model for Company Grade Officers in the United States Army. (2011). Schneider, R.J., Johnson, J.W., Cochran, C.C., Hezlett, S.A., Foldes, H., & Ervin, K.S. (DTIC No. ADA543634).

We present a dynamic model of company grade officer career continuance that is designed to inform future interventions intended to retain company grade officers, as well as to inform future research to enhance understanding of the retention process. Both a taxonomic model and a process model are presented, with the taxonomic model defining the constructs included in the process model, and the process model specifying relationships between constructs. A number of moderator variables are hypothesized, which are especially important for suggesting interventions to increase retention. Those moderator variables are consistent with interventions implemented as part of project STAY, and also suggest future interventions beyond the scope of that project. We conducted an initial evaluation of the model using (a) data obtained from existing officer surveys and tracking databases, and (b) evaluations of the interventions implemented as part of this project.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA543634>

RN 2011-06

Army Officer Counseling Training for Commanders: Participant Manual. (2011). Cullen, M.J., Foldes, H., Houston, J., Schneider, R.J., Duehr, E.E., & Johnson, J.W. (DTIC No. ADA544443).

We developed and evaluated a retention counseling training program targeted at influencing factors identified as important to company grade officers' retention decisions, documented in Johnson, Houston, Foldes, Cullen, Stellmack, Ervin, Schneider, & Duehr (2009; ARI RN 2011-08). This Research Note includes the training manual for participants and serves as an appendix to Johnson, et al.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA544443>

RN 2011-07

Establishing an Intellectual and Theoretical Foundation for the After Action Review Process: A Literature Review. (2011). Bliss, J.P., Minnis, S.A., Wilkinson, J., Mastaglio, T.W., & Barnett, J.S. (DTIC No. ADA543054).

The purpose of this report is to provide a literature review of the cognitive and learning science research that is relevant to defining an effective after action review (AAR) process. The goal of this review is to assemble research sources that apply to the design and conduct of after action reviews. Therefore, this report provides a synopsis of research that exists, identifies notable researchers who have addressed the problem, presents results of both military and non-military investigations or implementations of the AAR technique, highlights existing theories that may contribute to the advancement of AARs, and isolates specific areas that demand further work. The findings are a distillation of what is known about the AAR process. As such, they would be of interest to researchers who wish to acquire or update their knowledge of the area. The findings would also be of interest to those who train AAR facilitators as a comprehensive foundation of AAR research.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA543054>

RN 2011-08

Development and Evaluation of Training for Commanders to Enhance U.S. Army Company Grade Officer Career Continuance. (2011). Johnson, J.W., Houston, J., Foldes, H., Cullen, M.J., Stellmack, A.L., Ervin, K.S., Schneider, R.J., & Duehr, E.E. (DTIC No. ADA542440).

We developed and evaluated a retention counseling training program targeted at influencing factors identified as important to company grade officers' retention decisions. Training was given to Company Commanders, Battalion Commanders, XO's, and S3's in four brigades. The impact of training was evaluated by administering pre- and post-surveys (four months after training) to company grade officers under the trainees' command. Trainee feedback was used to revise the training program. Hierarchical regression analyses controlling for Time 1 satisfaction demonstrated that both the quantity and rated quality of counseling were related to Time 2 satisfaction levels on many factors believed to have the strongest connection to career continuance. Among those who received counseling from someone we trained, there was a significant increase in intention to stay in the Army from Time 1 to Time 2. The training focused on the importance of conducting informal counseling in addition to formal counseling, and results showed that both types of counseling interact to influence variables such as career satisfaction, leadership satisfaction, and morale. Recommendations are made to introduce training similar to that used in this intervention to officers early in their career, with periodic retraining of the counseling strategies and behaviors throughout an officer's career.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA542440>

RN 2011-09

Culturally Aware Agents for Training Environments. Final Report. (2011). Reilly, S.N., Metzger, M., Niehaus, J., Racich, M., Rosenberg, B., Weyhrauch, P., & Keeney, M. (DTIC No. ADB371216 / Restricted).

RN 2012-01

Negotiation Performance: Antecedents, Outcomes, and Training Recommendations. (2011). Foldes, H., Cullen, M.J., Wisecarver, M.M., Ferro, M., Jadallah, A.A., & Garven, S. (DTIC No. ADA550420).

One capability that is increasingly important to military leadership is effective negotiation skills. This report provides a comprehensive review of negotiation performance, outcomes, and antecedents, and presents a model describing the major linkages between key categories of variables. These include the proximal antecedents of declarative and procedural knowledge, as well as the more distal antecedents

of individual difference variables (e.g., cognitive ability, personality) and psychological processes (e.g., cognitive, motivational, and emotional). This report examines the psychological processes in particular detail and explores their effect on how people search for and process information, making them critical to achieving integrative, or mutually beneficial, negotiation agreements. A secondary focus of this report is the cross-cultural context in which many Soldiers increasingly conduct negotiations. The intersection of culture and negotiation is examined with reference to the proposed model and further benefits from the input of military SMEs. Implications for achieving beneficial outcomes in stability, security, transition, and reconstruction (SSTR) operations are discussed. set of training recommendations.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA550420>

RN 2012-02

A Case Study of the Impact of Religious Accommodations on Initial Military Training. (2011). Cobb, M.G., & Graves, T.R. (DTIC No. ADA618758).

Deputy Chief of Staff G-1 (DCS, G-1) directed ARI to examine the effect of specific religious accommodations (uniform/grooming) standards on: attaining individual Soldier skill/task proficiency, individual health and safety, unit cohesion, morale, good order, and discipline in Basic Combat Training (BCT) and Advanced Individual Training (AIT).
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA618758>

RN 2012-03

Notional Army Enlisted Assessment Program: Cost Analysis and Summary. (2011). Knapp, D.J., & Campbell, R.C. (DTIC No. ADA554865).

In the early 1990s, the Department of the Army abandoned its Skill Qualification Test (SQT) program due primarily to maintenance, development, and administration costs. This left a void in the Army's capabilities for assessing job performance qualification. To meet this need, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) instituted a 3-year program of feasibility research related to the development of a Soldier assessment system that is both effective and affordable. The PerformM21 program has had two mutually supporting tracks. The first track has focused on the design of a testing program and identification of issues related to its implementation. The second has been a demonstration of concept -- starting with a prototype core assessment targeted to all Soldiers eligible for promotion to Sergeant, followed by job-specific prototype assessments for several Military Occupational Specialties (MOS). The prototype assessments were developed during the first 2 years of the research program. Pilot testing of the prototype assessments was completed in the third year of the project and is documented in a companion report. The present report describes the notional test program and analyzes the anticipated costs and describes the benefits associated with its implementation.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA554865>

RN 2012-04

U.S. Army Research Institute Publications: FY 2011. (2012). (DTIC No. ADB382847 / Restricted).

RN 2012-05

U.S. Army Research Institute Research Publications for Public Distribution: FY 2011. (2012). (DTIC No. ADA566597).

ARI publishes bibliographies of its technical and research publications as convenient references for qualified agencies, individuals and sponsors. This listing describes reports with unrestricted distribution published during FY 2011, October 1, 2010 to September 30, 2011. The abstracts have been written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is often used to effectively communicate the details of research conducted. The bibliography includes bibliographic citations with abstracts, author indexing, and keywords. ARI Research Note 2012-04 (restricted) is the bibliography for all ARI FY 2011 publications, restricted and unrestricted.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA566597>

RN 2012-06

Recommendations for Enhancing U.S. Army Company Grade Officer Career Continuance. (2012). Johnson, J.W., Hezlett, S.A., Mael, F.A., & Schneider, R.J. (DTIC No. ADA564819).

This report recommends potential initiatives to improve the retention of company grade officers. The report builds on prior work completed for the ARI research program entitled Strategies to Enhance Retention (STAY). The officer portion of the STAY program sought, over a three-year period, to improve

the continuance of the Army's company grade officers. The recommendations are based on (a) focus groups and interviews on Army posts, (b) interviews with other subject matter experts, (c) literature review, (d) the model of company grade officer continuance, (e) the results of the evaluation of three interventions developed to enhance continuance, and (f) special expert panel meetings. First, we summarize major factors that were identified in focus groups and interviews as negatively and positively influencing officer retention. Then we propose a set of recommendations for future initiatives, organized in terms of the factors identified as influencing retention. Within each description, we discuss the nature of the intervention, the reasons the intervention should improve retention.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA564819>

RN 2012-07

Methods and Tools for Training Crisis Response. (2012). Zimmerman, L.A., Sestokas, J.M., Burns, C.A., Bell, J.A., & Manning, D.R. (DTIC No. ADA564316).

This report documents an effort initiated by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to refine behavioral training themes for crisis response and expand the Red Cape training methodology. As a part of the research and development, a web-based collaborative training program for use in a distributed environment and theme-based training vignettes for the U.S. Army Management Staff College's Garrison Pre-commander Course were developed. The research expands the theme-based training method to allow personnel from multiple, distributed agencies to train on large-scale crisis events. The research refined the Red Cape crisis action themes based on a cognitive task analysis with experts and developed scenarios within Think Under Fire Decisions (TUF-D), a rapid training development tool. The training system also incorporates an instructional overview guide and assessment tools, along with a vignette creation tool that allows individuals to rapidly develop training scenarios that address their specific needs and requirements.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA564316>

RN 2012-08

Training Gaps for the One System Remote Video Terminal: Observations from the Joint Readiness Training Center. (2012). Lipinski, J.J., & Bink, M.L. (DTIC No. ADA565312).

The One System Remote Video Terminal (OSRVT) is a combined system (including antennas, receiver, modem, and ruggedized personal computer) that receives and displays video and downlink data from a variety of unmanned and manned aircraft systems. The system is typically deployed either in a tactical operations center (TOC) or on a vehicle (e.g., Stryker) and operated by NCOs or junior officers. This information provides observers with critical near real-time battlefield information. Recently, however, informal observations by both training personnel and Soldiers suggest that while some OSRVT operators are capable of successfully using the system to support unit operations, others struggle to incorporate its capabilities. To address this issue, the present research documents current OSRVT use at the Joint Readiness Training Center at Fort Polk, Louisiana, and identifies the training gaps impeding its effective integration into tactical operations. The results identify a range of issues impeding effective OSRVT utilization, including a mismatch between those receiving formal training and those ultimately responsible for system operation, an absence of command emphasis on system integration, and the failure of leadership to clearly specify how OSRVT information should be utilized. Specific recommendations on improving the contribution of OSRVT information to mission planning and execution also are provided.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA565312>

RN 2013-01

Formulating the Brogden Classification Framework as a Discrete Choice Model. (2012). Diaz, T.E. (DTIC No. ADA570589).

The Brogden optimal classification framework measures potential classification benefits of predictors by assigning applicants to the jobs that will maximize predicted performance subject to job quota constraints. Current implementations of Brogden's framework do not include classification policy constraints (e.g., cut scores and gender restriction), applicant preferences, or the impact of other classification tools available to the Army (e.g., monetary incentives to channel applicants to particular job training). To accommodate elements of real world classification systems and thereby better inform operational problems, this research reformulated Brogden's classification framework using discrete choice modeling. We specified a mixed multinomial logit model for classification that is mathematically

equivalent to a multivariate normal based implementation of Brogden's framework. We also proposed an empirical or sample based method for classification analysis based on the multinomial logit (MNL) model that can accommodate personnel classification policy constraints, such as cut scores and gender restriction, and is robust to the functional form and distribution of the criterion estimates. Illustrative example applications of the MNL classification model showed the expected effects of policy constraints, with practical implications for the analysis results.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA570589>

RN 2013-02

Updating ARI Databases for Tracking Army College Fund and Montgomery GI Bill Usage for FY 2010 – 2011. (2013). Young, W.Y. (DTIC No. ADA582690).

This report describes the updating of ARI's educational benefits usage data base with Montgomery GI Bill and Army College Fund data for Army Regular, Reserve, and Guard components over the 2010 and 2011 period. For the Regular component, the report includes tabulations of program participation and benefit usage, type of educational program entered, and time between separation and start of education benefits. For Reserve and Guard components, the report includes tabulations by benefit eligibility status, VA training time type, and type of educational program entered. The tabulations are presented by entry cohort, going back to the 1985 entry cohort for all three components, and by separation year for the Regular component.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA582690>

RN 2013-03

Interpersonal Skills Summary Report. (2013). Hutchins, S., McDermott, P.L., Carolan, T.F., Gronowski, M.R., Fisher, A., & DeMay, M. (DTIC No. ADA585788).

This report was developed as part of a larger research project designed to identify evidence-based guidelines for the relative effectiveness of different training methods for acquiring and transferring skills involved in complex task domains. Broadly, the current report seeks to provide an update regarding the current state of the science on interpersonal skills (IPS) training. Specifically, this report discusses: 1) the literature review conducted for the broad area of IPS training, 2) literature surveys for six specific IPS with applicability to the U.S. Army, and 3) conclusions regarding the state of the science on IPS training. The broad IPS domain was covered by systematic search of interpersonal skills training research literature for the date range of 2000 through 2012. Skill-specific surveys of the literature covered active listening skill, assertive communication skill, nonverbal communication skill, relationship building skill, negotiation skill, and conflict resolution skill. The broad literature review conceptually frames the IPS domain. The six literature surveys serve as initial orientation to each IPS by providing: working definitions and alternative skill labels, a preliminary summary of the extant research, and a description of the experimental literature available for further detailed review and analysis.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA585788>

RN 2014-01

Soldier Development Following Negative Cross-Cultural Experiences: An Integrated Review of the Literature. (2014). Klafehn, J.L., Cai, D.A., Connelly, S., Mathieu, J.E., Maurer, T.J., Noe, R.A., & Salazar, M. (DTIC No. ADA599261).

One of the military's top priorities is to aid Soldiers in developing skills that will help them understand and more effectively interact with members of other cultures. A key determinant of cross-cultural skill development is the acquisition of hands-on experience within the culture itself. Previous research has focused heavily on the importance of multicultural experiences in cross-cultural skill development, but has largely ignored the effects when such experiences are difficult or challenging. Even fewer studies have examined the role of these experiences within a military context. This report is a preliminary attempt at addressing some of the factors that may contribute to (or hinder) Soldier development and learning following negative or challenging cross-cultural experiences. This report was assembled as part of a multidisciplinary effort wherein subject matter experts were asked to provide their perspectives on a number of topics related to the processing of and development following negative cross-cultural events. These topics included (a) the role of individual difference, group, and contextual factors as determinants of skill development following negative experiences, (b) differences in the types of cognitive processes that occur while a negative event is transpiring, and (c) factors and strategies that aid in recovery following a negative event.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA599261>

RN 2014-02

Development of the TARGET Training Effectiveness Tool and Underlying Algorithms Specifying Training Method: Performance Outcome Relationships. (2014). Hutchins, S., Carolan, T.F., Plott, B., McDermott, P.L., & Orvis, K.A. (DTIC No. ADA602469).

A four-year research effort was conducted to collect empirical evidence on the effectiveness of different training methods for acquiring and transferring complex cognitive skills (see Plott et al., 2014). To accomplish this goal, a series of meta-analyses were conducted examining six training methods (training wheels, scaffolding, part-task training, increasing difficulty, learner control, and exploratory learning). Algorithms were then developed to quantify the relationships between the training methods, performance, and various moderating factors. These algorithms can be used to perform tradeoff analyses to determine the effectiveness of different combinations of training method(s), task/skill type(s) being trained (e.g., perceptual, psychomotor), trainee characteristics (e.g., experience, aptitude), and type(s) of training performance outcomes (e.g., learning, transfer). Finally, to ensure these research findings and algorithms would be easily consumable by training developers and researchers, a training effectiveness tool was developed, called TARGET (which stands for Training Aide: Research and Guidance for Effective Training). This tool can aid training developers and researchers in making decisions concerning the most appropriate training method(s) to use depending on their particular training context. This report focuses on the algorithm development completed as a part of this larger research effort, as well as the algorithm incorporation into TARGET.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA602469>

RN 2014-03

What is Informal Learning and What are its Antecedents? An Integrative and Meta-Analytic Review. (2014). Cerasoli, C.P., Alliger, G.M., Donsbach, J.S., Mathieu, J.E., Tannenbaum, S.I., & Orvis, K.A. (DTIC No. ADA607502).

Workplace learning is critical to organizations. Hundreds of studies and over a dozen meta-analyses have explored the nature and effectiveness of formal learning in the workplace. Several review chapters and texts have integrated formal learning research findings to aid practitioners and future research. However, not all learning occurs formally. There is a growing consensus that the bulk of learning takes place experientially and informally, with estimates that 70% to 90% of all organizational learning occurs outside of formal training. Given that there has been little systematic treatment of informal learning, we provide a review and synthesis of the literature with two goals. First, we provide an intuitive framework to conceptualize the broader organizational learning domain, using it to position and define informal learning. Second, we utilize an interactionist perspective to explore environmental and personal factors that either enhance or deter informal learning. We then present a series of meta-analyses of existing data to highlight what is known and uncover what is unknown about antecedents of informal learning. We conclude with an agenda for further theorizing and research to promote the understanding and application of informal learning principles in organizations.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA607502>

RN 2014-04

Augmented Reality Mentor for Training Maintenance Procedures: Interim Assessment. (2014). Yarnall, L., Vasquez, S., Heying, E., & Werner, A. (DTIC No. ADA608418).

The Augmented Reality Mentor is a 2-yr advanced development effort seeking to demonstrate the training potential of integrating visual augmented reality (AR) with virtual personal assistant (VPA) technology. The training demonstration venue is basic maintenance training for the Army's Bradley Fighting Vehicle (BFV). This report is a high level assessment of the AR Mentor's potential as of the end of the first year of effort. BFV maintenance students, BFV instructors, and non-BFV mechanics felt that, relative to using the technical manual to guide training, the AR mentor presented less of a mental load. Relative to instructor training, novice maintenance students using AR Mentor showed equivalent levels of errors and help-seeking, and significantly lower levels of instructor intervention. Observations indicated AR Mentor students engaged in greater collaborative problem solving than in other learning conditions. Accuracy of voice recognition and relevance of instruction from the VPA was judged adequate. AR Mentor is a wearable technology; users indicated that at times its form and fit somewhat hindered their movement. The AR Mentor assessment results will inform continued development during the second year of the project.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA608418>

RN 2015-01

ROTC Longitudinal Annual Report: 2013. (2014). Bynum, B.H., & Legree, P.J. (DTIC No. ADB404565 / Restricted).

RN 2015-02

Assessing the Use of Game Based Exercises in the Staff Attack-the-Network Course. (2015). Bink, M.L., & Miller, J.T. (DTIC No. ADA621958).

The U.S. Army increasingly relies on serious games as a training tool for tactical tasks. The use of game-based exercises is nonetheless a novel approach for training human-intelligence tasks. In order to determine the extent to which a virtual game-based environment provided an effective means to apply human-intelligence skill, two forms of scenario-based practical exercises were compared in the Attack the Network course. Course performance and perceptions of training were compared across students who completed traditional paper-based practical exercises and students who completed practical exercises based in the Army's Enhanced Dynamic Geo-Social Environment game-based training environment. The game-based practical exercises did no better in increasing end-of-course test scores than did traditional paper-based practical exercises. In addition, the paper-based practical exercises were perceived as more beneficial to learning and course outcomes as compared to the game-based practical exercises. These results add to the growing literature that fails to find a relative advantage of game-based training.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA621958>

Study Reports

SR 2000-01

Integration of Training Development among Schools and Distributed Training Environments.

(1999). Clagg, R.A., Detrani, R.L., Burnside, B.L., & Finley, D.L. (DTIC No. ADA371931).

Distributed training development activities provide a means for geographically separate proponents, subject matter experts, and users to interact while developing training products. While this may not be a new concept, it has become increasingly important with the Army's digitization efforts and the rapid fielding of other new systems. This study examines distributed training development activities among U.S. Army Training and Doctrine Command (TRADOC) proponent schools and other distributed training environments, such as that associated with Program Managers. The approach was a critical investigation and examination of where the Army is and where it needs to be heading as it tackles the issue of distributed training development in support of newly fielded digital information systems. The study revealed that there are major issues and needs associated with the development and distribution of training at sites other than TRADOC proponent schools. An important component of the study is the identification, analysis, and comparison of courses of action for addressing the current issues and needs associated with distributed training development. Courses of action are thoroughly analyzed and compared and both near- and long-term implementation considerations are identified.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA371931>

SR 2000-02

The Family Support Group Leaders' Handbook. (2000). Schumm, W.R., Bell, D.B., Milan, L.M., and Segal, M.W. (DTIC No. ADA377285).

This report helps Army Family Support Group (FSG) leaders - particularly in rapid deployment units - start and operate FSGs, by providing them the best information from Army research, family support professionals, and experienced FSG leaders. Although expert judgment has been exercised in the selection and presentation of available materials, the ideas here are only suggested courses of action. Individual FSGs are quite different from one another, and most of these ideas have not been subjected to rigorous evaluations. The topics covered include (1) what FSGs are expected to accomplish, (2) suggestions for starting (or re-energizing) an FSG, (3) relevant Army Regulations, and (4) sources of additional help in operating the FSG or for assisting FSG members.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA377285>

SR 2000-03

Analysis of the Revised Army Career Transitions Survey and Comparison with the Fall 1996 Sample Survey of Military Personnel: Results and Recommendations. (2000). Giacalone, R.A. (DTIC No. ADA377201).

The Army Career Transition Survey (ACTS) was an exit survey designed to measure Soldier satisfaction with various aspects of Army life and to determine whether dissatisfaction with these aspects was related to leaving the Army. The purpose of the present study was to analyze the current ACTS data, to compare responses to ACTS items with responses to comparable items on the Sample Survey of Military Personnel (SSMP), and to make recommendations about continuing the ACTS. The analysis of the current ACTS data identified high satisfaction items such as Army Community Service programs and low satisfaction items such as amount of time separated from family. Although there were a few demographic differences, most differences involved rank groups (officers more satisfied than enlisted personnel with higher levels of enlisted more satisfied than lower levels) and marital status (married personnel generally more satisfied than single personnel). Major reasons for leaving included amount of time separated from family, respect Army shows for its Soldiers, and promotion/advancement opportunities. A log linear analysis revealed no overall statistical difference between similar items on the ACTS and SSMP. Since the ACTS provides information redundant to that obtained on the SSMP, it was recommended that the ACTS be discontinued. Also included in the report are appendices containing a survey assessing the satisfaction of the users of Army survey data for calculating Return on Investment (ROI) for survey data.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA377201>

SR 2000-04

Differences in Job Satisfaction of Soldiers in Dual Military and Traditional Marriages. (2000). Marshall-Mies, J.C., Seligson, T.B., & Martin, J.A. (DTIC No. ADA378008).

This research, which was based on data from the 1995 administration of the Sample Survey of Military Personnel (SSMP), was conducted to compare the attitudes of female officers and enlisted personnel in two types of marriages: Dual Military marriages and Traditional marriages. Overall, there were many more similarities than differences between the women in these two types of marriages in terms of: overall quality of Army life, stress levels, job satisfaction, Army training and promotion opportunities, spousal support for their Army careers, and most basic benefits. The analysis also revealed some significant differences between the two groups. Compared to those in Traditional marriages, female officers and enlisted personnel in Dual Military marriages were more likely to be satisfied with or optimistic about: the possibility of being allowed to stay in the Army beyond their enlistment and until eligible for retirement, the possibility of being promoted on-time or ahead of schedule, career and advancement potential, Army job security, and the spouse's career and work opportunities. Female officers and enlisted personnel in Dual Military marriages were also more likely than their counterparts in Traditional marriages to believe in fairness of Army standards and military justice, have little difficulty meeting current weight standards and APFT requirements; and be satisfied with the amount of VHA/COLA.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA378008>

SR 2000-05

Live Fire Futures. (2000). Burkett, M.L., Mullen, W.J., & Meliza, L.L. (DTIC No. ADA381104).

This study analyzes the impact of force modernization and asymmetric warfare on future live fire training, recommends a new live fire training strategy, and describes a concept for future live fire ranges. The U.S. Army's force modernization goals include improving the range, precision, and effects of direct and indirect fires. Such enhanced capabilities will significantly influence requirements for support of live fire training. Employment of smart weapons, non-line-of-sight weapons, new target acquisition systems, and digital command, control, and communications systems will characterize future combat and should be included in future training. The other major force for change in live fire training is the non-linear nature of future combat. Prominent in the U.S. Army's challenges of the 21 Century will be a wide range of possible operational environments in terms of strategic goals, the political-military situation, the nature of the enemy, civilian population considerations, and the characteristics of the battleground. These variables must also be addressed in the design of training support.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA381104>

SR 2000-06

Racial Differences in Job Satisfaction. (2000). Marshall-Mies, J.C., Martin, J.A., & Seligson, T.B. (DTIC No.).

This research summarizes results from a special analysis of data from the 1995 administration of the Sample Survey of Military Personnel (SSMP). The analysis identified differences between black and White Army officers and enlisted personnel on factors related to job satisfaction and intention to commit to a career in the Army. Findings show that black officers and enlisted personnel are more likely than their White counterparts to be satisfied with certain job characteristics, basic benefits, housing, duty assignments, and overall quality of Army life. Black Soldiers also subscribe to more egalitarian attitudes concerning male/female work teams and performance but are more negative about racial discrimination and equal opportunity issues. White officers and enlisted personnel are more likely than black to report joining the Army from a desire to serve their country, experiencing higher levels of stress and lower levels of personal and unit morale, and believing that males work harder and perform better than females. The analysis also identified racial and gender differences among different groups in the area of career intentions: black female officers and black male and female enlisted personnel are more likely than the corresponding White groups to intend to stay in the Army until retirement. In comparison, White female officers and White male and female enlisted personnel are more likely to intend to leave the Army after their present obligation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA383184>

SR 2001-01

Training Analysis and Feedback Center of Excellence. (2000). Anderson, L.B., Begley, I.J., Arntz, S.J., & Meliza, L.L. (DTIC No. ADA384030).

This report describes a U. S. Army Research Institute (ARI) Simulator Systems Research Unit study conducted in response to a request from the U.S. Army Training and Doctrine Command (TRADOC) Army Training Modernization Directorate (ATMD). The goal of the project was to assess the feasibility of supporting the training analysis and feedback process for the U.S. Army's maneuver combat training centers (MCTCs) and selected homestation locations from a single centralized location, referred to as a Training Analysis and Feedback Center of Excellence (TAAF-X). The study refined ATMD's TAAF-X concept, identified potential implementation problems, described strategies for overcoming implementation problems, developed a TAAF-X Task database to use as an evaluation tool in analyzing the most efficient combination of strategies to overcome implementation problems, and estimated the overall feasibility of implementing the TAAF-X concept. Additionally we examined current programs under development and their potential impact on the TAAF-X concept.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA384030>

SR 2001-02

Issues of Adaptive Automated Surveys in a Computer Network Environment. (2001). Entin, E.E., Kerrigan, C., Berbaum, M., Lancey, P., & McCallum, D. (DTIC No. ADA389867).

Computer-based surveys administered over a computer network hold out a myriad of possibilities for tailoring surveys to particular groups or even to individual respondents, including adaptive automated surveys and new types of surveys never possible before. Computer-administered surveys allow survey items and instructions to be conveyed textually, graphically, and even in animation. Computer networks thus provide an ideal medium on which to conduct innovative, multimedia, dynamic surveys--surveys that can be sent instantaneously to a large number of recipients, regardless of whether the recipients are on-line at that time. They also allow the recipients to reply at a time that is convenient for them, without regard to whether the originator of the questionnaire is currently on-line and without having to look up an address or find a post box. The goals for this research included a review of the state of the art in current survey technology, an analysis of which methods and procedures can be applied directly to computer network surveys, and hypothesized extrapolations of certain aspects of current survey technology that hold promise for the new medium of computer networks. Based on these findings, we delineated four sets of critical issues that must be investigated in order to conduct valid and reliable network surveys. We also conducted two pilot experiments to explore initial hypotheses about how effective network questionnaires should be formatted and how supporting help could be offered. These pilot experiments provided an opportunity to test and validate the experimental design and methodology that we developed. The appendix of this report discusses four areas in which empirical research is needed and outlines a program for conducting such research.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA389867>

SR 2001-03

Effectiveness of Distance Learning for the Battle Staff NCO Course. (2001). Drenth, D.J., Kubisiak, U.C., & Borman, W.C. (DTIC No. ADA393426).

This study compared graduates of a course taught through the Sergeants Major Academy by distance learning with graduates of the same course taught in residence, as usual. Unlike previous evaluations of distance learning, the measures used to compare groups were not students' immediate reactions to the course nor their end-of-course test scores but measures delayed until the graduates were on the job: (1) a written test of their job knowledge, and (2) job performance ratings by their supervisors. Special care was taken to insure these measures were reliable and valid; the 42-item written test included only material covered in the course and the supervisors were motivated and trained on the technique of making accurate performance ratings. Knowledge test scores for a total of 172 NCOs and performance ratings for a total of 145 NCOs were collected from 8 sites. Results indicate that the different formats for the course, distance learning versus residence, had no reliable effect on either measure. NCOs received nearly the same knowledge test scores and supervisory ratings, on average, regardless of how the course was presented, supporting the conclusion that distance learning technology, as an alternative to residence-based training, does not involve a sacrifice of graduate quality.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA393426>

SR 2001-04

Civilian Spouses of Soldiers: Comparison of the Results for Male and Female Spouses. (2001). Marshall-Mies, J.C. (DTIC No. ADA396481).

The 1995 Survey of Army Families III was conducted to examine the impacts of various Army programs on Army families, to identify new and emerging family issues, to assess progress in resolving Army Family Action Plan issues, and to track trends in the characteristics of Army families. A special analysis, summarized in this report, was designed to examine and compare these issues as they relate to civilian male and female spouses of Army Soldiers. This report is based on 12,561 surveys, of which 1,757 were from male spouses and 10,804 were from female spouses. Although there were some differences between them (discussed in this report), civilian male and female spouses generally held similar attitudes and opinions in the 12 topical areas contained in the survey: Housing and Neighborhood, Family Relocation, Family Separations, Army Chaplains, Army and You, Your Background, Paid and Volunteer Work, Soldier Spouse's Background, MWR Programs and Installation Services, Children, and Army Way of Life. These findings will be useful for Army agencies and commands for developing plans, assessing policies, and evaluating program operations and outcomes.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA396481>

SR 2002-01

Development of a Personal Computer Based Enlisted Personnel Allocation System. (2001). Greenston, P.M., Mower, D., Walker, S.W., Lightfoot, M.A., Diaz, T.E., McWhite, P.B., & Rudnik, R.A. (DTIC No. ADA399441).

This report summarizes the development of the PC-Based Enlisted Personnel Allocation System (EPAS) through completion of the Functional Description phase (circa 1998). EPAS is a software system designed to introduce person-job-match optimization into REQUEST, the Army's training reservation system. This report reflects the results of research conducted and sponsored by the U.S. Army Research Institute over the 1993 – 1998 period. This work established the feasibility of using sophisticated optimization procedures to improve classification efficiency, as well as the additional classification gains made possible by utilizing measures of Soldier performance as assignment composites in the classification process. The production version of EPAS, designed as an enhancement to and subsystem of REQUEST, will be transparent to Army applicant and career counselor. Evaluation field-testing is scheduled for FY 2002 – 2003.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA399441>

SR 2002-02

Workshop on Language Student Attrition. (2001). Whelan, B.E. (DTIC No. ADA399533).

Seventy individuals from Government agencies (military and civilian), academia, and contractor organizations attended all or parts of a *Workshop on Student Attrition* held at the Defense Language Institute Foreign Language Center (DLIFLC) in Monterey, CA. The goals of the workshop were to:

- Assess the level of DLIFLC linguist attrition.
- Analyze the causes and patterns of attrition.
- Recommend ways to improve the rate of attrition.

This report is the proceedings of the workshop. It provides documentation of papers and briefings presented to workshop participants, along with recommendations for reducing attrition that were generated by the participants.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA399533>

SR 2002-03

Proposed New Army Aptitude Area Composites: A Summary of Research Results. (2002). Greenston, P.M. (DTIC No. ADA398686).

The Army currently employs nine Aptitude Area (AA) composites to classify new recruits; they are derived from the Armed Services Vocational Aptitude Battery (ASVAB) subtests in a manner that makes them easy to calculate but inefficient for classification. At the end of 2001 the Office of the Secretary of Defense (OSD) will eliminate the two timed subtests in the ASVAB. This will reduce the classification efficiency of the existing Army composites and necessitate redefinition of the existing composites. In their place, the Army is considering for adoption new composites that have been developed by ARI based on a job performance criterion. ARI has developed a set of 17 operational classification-efficient

job families and corresponding composites that would be used for administrative, counseling, and school proponent purposes. The new structure strongly resembles the existing structure, in effect being a further shredding of existing families. The new composites / job families are undergoing further testing and evaluation, and will be considered for implementation in the 2004 - 2005 period. In the meantime, ARI has developed an interim set of composites that retain the existing nine operational job families but are also based on defensible job performance data. These will be implemented 2002 while planning for the new 17 Army Aptitude Area composites goes forward.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA398686>

SR 2002-04

Managing Force XXI Change: Insights and Lessons Learned in the Army's First Digital Division. (2002). Leibrecht, B.C., Johnston, J.C., Black, B.A., & Quinkert, K.A. (DTIC No. ADA400644).

This report is the result of a study that explored techniques for capturing and sharing tacit knowledge gained during Force XXI transition. The primary goal was to facilitate passing of hard-won information from one leader to the next. The study team elicited knowledge in structured interviews with senior leaders in the Army's First Digital Division (FDD). They converted the knowledge into problem-focused chunks, then derived practical guidelines for facilitating change. The team designed and developed a preliminary, computer-based Leader's Tool to help the target audience define and solve change-management problems. They then populated the tool with the project's knowledge products. The report discusses the team's lessons learned for capturing and organizing sharable knowledge and for creating automated tools to support the management of change. It also illustrates the FDD leaders' insights and lessons learned regarding the transition process and the impact of Force XXI capabilities. Recommendations for leveraging and extending the project's methodology and the Leader's Tool technology are offered.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA400644>

SR 2002-05

Training Concepts in Virtual Environments. (2002). Sticha, P.J., Campbell, R.C., & Knerr, C.M. (DTIC No. ADA402315).

The goals of this research are (a) to develop a method for evaluating the capabilities of virtual simulation to represent the tasks and missions within a military application domain, (b) to demonstrate the methods in two domains, and (c) to propose ways to integrate the method with existing doctrine. Initial activities surveyed existing training systems and reviewed the capabilities of key virtual environment technologies. From this survey, we identified capabilities most likely to impede successful development of virtual environment training systems. A review of existing methods of evaluating or predicting training effectiveness identified several candidates for incorporation into the method produced in this project. Based on the results of this review, we developed a method for Specifying Training Requirements in Virtual Environments (STRIVE), combining features from two existing methods. The STRIVE methodology assesses the capability of virtual environment technology to support task performance based on subject matter expert judgments of selected cues and responses needed to perform task activities. A demonstration of the model was developed using Microsoft Access97. The STRIVE methodology can be used during the concept exploration and definition phase of virtual environment training system design and can support the development of the Operational Requirements Document (ORD).

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA402315>

SR 2002-06

The Multi-Skilled Soldier Concept: Considerations for Army Implementation. (2002). Nelsen, J.T., & Akman, A. (DTIC No. ADA402901).

The purpose of this study was to analyze the meaning and implications of the Multi-Skilled Soldier (MSS) Concept and to assess the considerations for Army-wide implementation in order to provide a basis to make decisions whether or not to proceed with realization of the MSS Concept and, if so, how. The specific objectives were to analyze the Concept and its implications generally for the Army and specifically for the Objective Force, to develop a Blueprint for use in defining and assessing potential MSS implementation and sustainment courses of action, to devise a Roadmap outlining major actions required for MSS implementation by 2008, to craft a Study Plan of research and analysis projects, including behavioral research, necessary to support MSS implementation and sustainment, and to make pertinent conclusions and recommendations. This study relied heavily on non-attribution interviews conducted from 2001 through 2002 with those involved in developing the concepts for the Objective

Force and in fielding the initial Interim Brigade Combat Teams (IBCTs). This report serves as a departure point for further research and development work relating to crafting and assessing implementation and sustainment courses of action, as well as supporting personnel and training designs and associated best practices.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA402901>

SR 2002-07

Training on the Web: Identifying and Authenticating Learners. (2002). Curnow, C.K., Freeman, M.W., Wisher, R.A., & Belanich, J. (DTIC No. ADA405005).

Soldiers who receive training in the workplace, at their residences, or at other sites outside the traditional classroom increasingly rely upon asynchronous distributed learning systems. This accentuates the need to identify various forms of training compromise, such as obtaining questions beforehand or enlisting a proxy for test taking in non-proctored, web-based learning environments. A one-day workshop, summarized in this report, was conducted to identify practical solutions to training compromise on the Web or military intranets. Experts from government, academia, and industry generated solutions in the areas of test security, biometrics (including fingerprint identification, face recognition, iris scanning, and hand writing recognition), legal issues, public key infrastructure, instructional design, and test design. Following the workshop, an Army advisory group prioritized the solutions into a final list of recommendations, included here as a starting point for addressing and preventing training compromise.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA405005>

SR 2002-08

Training Model for Contingency Operations. (2002). Smith, M.L., Holden, W.T., Starry, H.M. (DTIC No. ADA408556).

This report documents the process and the products of a study examining training and training support for units involved in deployments for contingency operations. The purpose of this study was to assist U.S. Army leaders and training resource managers to better train units, staffs, leaders and Soldiers based on the realities and challenges of the 21st century operational environment. It was completed in support of a specific request made by the U.S. Army Training and Doctrine Command (TRADOC) for assistance in providing training support to Army ground forces preparing for, participating in, or returning from contingency operations. The study began by surveying the existing body of knowledge concerning U.S. military contingency operations and military deployments conducted in the 1990s. The survey's purpose was to identify and codify full spectrum training and training resource requirements for units participating in contingency operations. The survey's findings were then used to develop an improved training model and associated templates, and to recommend changes in current training policies and procedures. The eight principal recommendations address training strategies, training documentation, resourcing, decision-making, and training management.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA408556>

SR 2003-01

Training Requirements of Battle Staff NCOs in Digital Units. (2003). Felton, R.J., Schaab, B.B., & Dressel, J.D. (DTIC No. ADA415442).

The United States Army is transforming to a versatile force with the capabilities, particularly the digital technology, necessary to optimize the flow of information and enhance situational awareness. One vital enlisted position affected by the implementation of these digital technologies and equipment is assigned to Battle Staff Noncommissioned Officers. The Battle Staff Noncommissioned Officer course trains Noncommissioned Officers to be integral members of battle staffs in analog units. The current institutional training does not include instruction on how to use digital technology to leverage performance in Tactical Operations Centers. To determine if the role of the Battle Staff Noncommissioned Officer changed with the inception of digital technology, data were collected from 522 Battle Staff Noncommissioned Officers. Findings, based on surveys, observations, and interviews, suggest the need to include digital training within the Battle Staff Noncommissioned Officers Course and the need for system integration training to support the change in the role of the Battle Staff Noncommissioned Officer.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415442>

SR 2003-02

Impact of the Army Continuing Education System on Soldier Retention and Performance: Data Analyses. (2003). Sticha, P.J., Dall, T.A., Handy, K., Espinosa, J., Hogan, P.F., & Young, M.C. (DTIC No. ADA415373).

This evaluation of the Army Continuing Education System (ACES), considered the following programs: (a) Tuition Assistance (TA) (b) Functional Academic Skills Training (FAST), (c) Military Occupational Specialty Improvement Training (MOSIT), (d) Noncommissioned Officer (NCO) Leader Skill Enhancement Courses, and (e) the Armed Forces Classification Test (AFCT). The assessment of the effectiveness of these programs is based on their ability to enhance Soldier performance and increase the prospects of promotion, as well as to reduce attrition and increase reenlistments. The evaluation data came from a longitudinal administrative database that tracked a three-year accession cohort over a six-year period and an NCO database including self-reported participation in ACES programs, promotion information, and observed performance ratings. The analysis was designed to separate effects of participant characteristics from the effects of the program, and to control for differences in the opportunity and propensity to participate in ACES. Participation in TA and FAST were associated with an increase in the probability of first term reenlistment. FAST participation was also associated with lower first-term attrition. Participation in several ACES programs showed positive effects on measures of performance and promotion potential.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415373>

SR 2003-03

Basic Officer Leader Course Cadre Train-Up. (2003). Salter, M.S., Wampler, R.L., Centric, J.H., Dlubac, M.D., & Beal, S.A. (2003). (DTIC No. ADB291525 / Restricted).

SR 2003-04

Overall Assessment and Recommendations: Basic Officer Leader Course. Phase 2: Pilot Classes. (2003). Salter, M.S., Wampler, R.L., Centric, J.H., & Dlubac, M.D. (DTIC No. ADB291526 / Restricted).

SR 2003-05

Assessment of the Basic Officer Leader Course: FY 2002 Pilot Classes. (2003). Salter, M.S., Centric, J.H., Wampler, R.L., Rich, K.B., & Beal, S.A. (2003). (DTIC No. ADB291389 / Restricted).

SR 2003-06

Basic Officer Leader Course: Follow On Interviews and Surveys. (2003). Salter, M.S., Wampler, R.L., Centric, J.H., & Dlubac, M.D. (2003). (DTIC No. ADB291527 / Restricted).

SR 2003-07

Assessment of the Basic Officer Leader Course: FY 2001 Pilot Classes. (2003). Salter, M.S., Centric, J.H., & Beal, S.A. (DTIC No. ADB291374 / Restricted).

SR 2003-08

Off Line Field Test Design for Evaluating Two Approaches to Person Job Matching: The Army Recruit Quota System and the Enlisted Personnel Allocation System. (2003). Lightfoot, M.A., & Diaz, T.E., & Greenston, P.M. (DTIC No. ADA418027).

The Enlisted Personnel Allocation System (EPAS), initially developed through a multi-year research and development project conducted by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), is the latest tool available to the Army for improving the classification process. Designed to be a subsystem of the Recruit Quota System (REQUEST), EPAS is a person-job-matching (PJM) method that optimizes the assignment of recruits to entry-level military occupational specialty (MOS) training. It goes beyond REQUEST, the Army's present approach to PJM. REQUEST identifies high priority MOS for which an applicant meets the minimum Aptitude Area composite score qualifications. In addition, EPAS identifies those MOS in which an individual is likely to perform with the greatest effectiveness, while meeting overall Army accession goals and filling critical MOS. A PC-EPAS prototype was created and evaluated based on laboratory simulations of the Army's classification process in FY 1998. The results of laboratory classification simulations provided evidence that EPAS can improve the mean predicted performance (measured as the average Aptitude Area composite score of recruits in their assigned job training) of a fiscal year recruit cohort, while simultaneously meeting Army enlistment requirements. Based on these positive laboratory results, ARI developed a production version of EPAS in FY 2000. The planned field test will examine the likelihood of realizing the laboratory findings in an

"operational" environment, using EPAS linked as a subsystem to REQUEST and to actual transactions data within a simulation framework. This report describes the planned field test design.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA418027>

SR 2004-01

Applying a Multi-Skilled Soldier Concept to the Stryker Brigade Combat Team. (2003). Nelsen, J.T., & Chirico, M. (DTIC No. ADA429930).

The general purpose of this study was to deepen and broaden thinking about the nature and implications of possible Multi-Skilled Soldier (MSS) Concept implementation. Specific objectives were (1) to determine applicability of the MSS to the Stryker Brigade Combat Team (SBCT), as it might be implemented in Initial Entry Training (IET) and (2) to prototype MSS Concept implementation for the SBCT, considering possible implementation for the Future Force. The report also defines the MSS; shows how the MSS Concept might fit conceptually within a larger Army training, education, and professional development model for Soldiers of all ranks; offers an MSS Program design for IET; and crafts actionable recommendations regarding general MSS implementation for IET. The study concludes that the MSS Concept is fully applicable to the SBCT, as well as the so-called Current Force. It also concludes that MSS implementation would have a significant salutary effect on unit training readiness postures across the force. This study relied heavily on insights and analysis gained from interviews with groups of senior NCOs and officers within the 3rd Brigade (SBCT), 2nd Infantry Division, Ft. Lewis, WA, during 2002.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA429930>

SR 2004-02

Basic Officer Leader Course: Recommendations on the Phase 2 Program of Instruction, Cadre Selection, and Cadre Train-Up. (2004). Salter, M.S., Centric, J.H., & Wampler, R.L. (DTIC No. ADB295074 / Restricted).

SR 2004-03

Linguist Training and Performance. (2004). Childs, J.M. (DTIC No. ADA420932).

This study examined the effectiveness of training programs delivered by the Defense Language Institute Foreign Language Center (DLIFLC) and Advanced Individual Training (AIT). Data were gathered from linguists assigned to AIT or units, using Web-based questionnaires. DLIFLC graduates (n = 100), bypass linguists (n = 26) and their AIT instructors (n = 12), unit linguists (n = 11), and unit supervisors (n = 3) provided Likert ratings and narrative comments to address eight major areas of interest. Results indicate that linguists feel that DLIFLC and AIT are adequately preparing them for their jobs, that minor curriculum modifications can yield more effective DLIFLC and AIT programs, and that bypass linguist responses were similar to those of DLIFLC graduates. Linguists prefer learning by interacting with instructors and peers rather than using technology-based instruction such as with distance learning.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA420932>

SR 2004-04

Replication of Zeidner, Johnson, and Colleagues' Method for Estimating Army Aptitude Area Composites. (2004). Diaz, T.E., Ingerick, M., & Lightfoot, M.A. (DTIC No. ADA426299).

To select and classify recruits to entry-level jobs, the Army employs nine Aptitude Area (AA) composites that are derived from the Armed Services Vocational Aptitude Battery (ASVAB). Effective 2002, the Army adopted an "interim" set of nine AA composites based on empirically estimated weights for a seven ASVAB test battery. Zeidner, Johnson, and colleagues had developed these "interim" composites as part of ongoing research into improved military classification systems. The purpose of the present study was to independently replicate and document – as a prerequisite for subsequent evaluation – the Zeidner, Johnson, and colleagues' method, and previously reported results, for the 9, 17, and 150 composites comprising their proposed classification system. Following Zeidner, Johnson, and colleagues' method, the present study successfully reproduced the 9, 17, and 150 composites. These findings support the operational use of the 9 "interim" composites, as well as the use of the 9/17/150 composites in future research and policy analysis evaluating the potential of the proposed two-tiered classification system to substantially improve Army-wide classification and assignment.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA426299>

SR 2004-05**Estimating Academic Attrition from Technical Training School Data: Method and Simulation Results.** (2004). Diaz, T.E., Ingerick, M., Fowler, R., & Lightfoot, M.A. (DTIC No. ADA426300).

This study proposes a logistic regression-based approach for estimating academic attrition from technical training school data. The proposed approach enables Army personnel managers to evaluate tradeoffs when making decisions about where to set minimum enlistment standards. A large-scale simulation was conducted based on actual training school data from a selected MOS to evaluate the approach and to assess sampling error of estimated attrition rates under different sample sizes and operational scenarios. Major findings indicate that: (a) a simple approach based on the logistic regression using only cognitive aptitude information is adequate for evaluating impact of changes in minimum enlistment standards on academic attrition for MOS with medium validity or greater; (b) a large enough sample size allows smaller changes in minimum enlistment standards to achieve a targeted attrition rate with confidence; and (c) personnel and training decisions could be greatly improved by extending the current model to incorporate information in addition to cognitive aptitude. The report includes a ready-to-use statistical program for applying the proposed approach to actual training school data for the purposes of making operational decisions.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA426300>

SR 2005-01**Evaluation of Alternative Aptitude Area Composites and Job Families for Army Classification.**

(2004). Diaz, T.E., Ingerick, M., & Lightfoot, M.A. (DTIC No. ADA430041).

Effective 2002, the Army adopted a set of nine AA composites based on empirically estimated weights for a seven subtest ASVAB battery. With support from the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), Zeidner, Johnson, and colleagues developed these composites as part of a proposed two-tiered classification system. This change was motivated by a program of research funded by ARI and conducted by Zeidner, Johnson, and others demonstrating that the proposed system could significantly improve the overall classification and assignment of Army personnel to entry-level jobs. The current study aimed to independently evaluate the efficacy of the proposed AA composites, and corresponding job families, to meet the Army's classification objectives. More specifically, the present study tested the stability and differential validity of the proposed AA composites and accompanying job families, particularly the 17 and 150 relative to the 9 AAs, and their practical effects on classification efficiency, as measured by mean predicted performance (MPP). For both scientific and practical reasons, the findings suggest the continued operational use of the nine (standardized) AA composites based on the empirically estimated weights developed by Zeidner and colleagues.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA430041>

SR 2005-02**A Model of Reenlistment Behavior: Estimates of the Effects of Army's Selective Reenlistment Bonus on Retention by Occupation.** (2005). Hogan, P.F., Espinosa, J., Mackin, P.C., & Greenston, P.M. (DTIC No. ADA437363).

A logit model was applied to estimate the effect of selective reenlistment bonuses (SRBs) on the retention rates of Army Soldiers. The model was estimated separately by occupational group and by first (zone A), second (zone B) and third term (zone C) reenlistment decisions. An "annualized cost of leaving" (ACOL) variable was constructed to estimate the net financial returns to reenlisting in the Army compared to leaving for the civilian sector. The model was estimated using data on actual reenlistments from the period FY1990 through FY2000. The effects of SRBs on reenlistments at Zones A, B, and C were estimated at three levels of occupational aggregation—all Army, CMF, and MOS. After out-of-sample testing, we re-specified and re-estimated the model. In general, the results for Zone A at all levels of occupational aggregation indicate that reenlistment bonuses have a positive and statistically significant effect on Zone A reenlistments. The magnitude of the effect varied by occupation, but a one-level increase in SRB at Zone A typically increases the reenlistment rate by three to seven percentage points, depending upon the occupation. The results for Zone B are also solid at both the CMF and MOS levels. Results for Zone C, where reenlistment rates are typically very high, were reasonably solid but not as good as the Zone A and B results. We were unable to obtain positive, statistically significant ACOL parameter estimates for a small number of occupation groups. Statistically significant effects for demographic control variables and labor market conditions were also obtained.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA437363>

SR 2005-03

Summative Evaluation of Helicopter Gunnery Training. (2005). Sharkey, T. J., Stewart, J.E., & Salinas, A.Y. (DTIC No. ADB311648 / Restricted).

SR 2005-04

Sergeants as Drill Sergeants: Returning Sergeants to Drill Sergeant Duty. (2005). Klein, G.E., Salter, M.S., Gates, J.W., Sullivan, R., Kinnison, H., Lappin, M., & Graham, S.E. (DTIC No. ADA437700).

The intent of this Study was to provide senior Army leadership with information to support a decision as to whether the Army should readmit Sergeants (E-5) to Drill Sergeant duty. Surveys, interviews, and analyses of performance in Drill Sergeant School and Initial Entry Training units consistently indicated that Sergeants (E-5) could perform successfully as Drill Sergeants. The graduation rates from Drill Sergeant School were equivalent for Sergeants (E-5) and Staff Sergeants. Supervisor ratings of Drill Sergeant performance in Initial Entry Training units found the Staff Sergeant (SSG) Drill Sergeants to be rated only slightly higher than the Sergeant (E-5) Drill Sergeants which was expected. Overall SGT (E-5) Drill Sergeant performance was rated "high." In addition, the SGT (E-5) Drill Sergeants were rated both "high" and equivalent to the SSG Drill Sergeants in a number of areas to include: respect for the trainees, ability to manage stress and handle volatile situations, and various gender integrated training issues. The interim results were provided to TRADOC DCSOPS&T in Nov 2004. Subsequently, the Commander, TRADOC, recommended to the Chief of Staff of the Army that a change be made to Army policy. In Feb 2005, the CSA directed that Sergeants be reinstated to Drill Sergeant duty.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA437700>

SR 2006-01

Development of a Prototype Self-Assessment Program in Support of Soldier Competency Assessment. (2005). Keenan, P.A., & Campbell, R.C. (DTIC No. ADA440050).

Soldiers in the 21st century must possess the knowledge, skills, and other attributes to perform effectively in complex technical, information-rich environments. This study, Development of a Prototype Self-Assessment Program in Support of Soldier Competency Assessment, was conducted as a counterpart to the U.S. Army Research Institute for the Behavioral and Social Sciences' (ARI) Performance Measures for 21st Century Soldier Assessment (PerformM21). PerformM21 is a 3-year feasibility effort to identify viable approaches for an operational performance assessment system for Army enlisted personnel.

In this study, the researchers identified the design and content of a self-assessment system (SAS) that would (a) help Soldiers feel confident about testing, (b) inform Soldiers about the junior noncommissioned officer (NCO) promotion system, and (c) familiarize Soldiers with the duties and responsibilities of NCOs. Information about best practices in the field of self-assessment/test preparation including what is done in the other Armed Services, academia, and the test industry was used to develop a prototype SAS that would explore the realm of test preparation functions, actions, and items that a typical Soldier would encounter during this phase. The prototype SAS reflects PerformM21 test parameters; it is web-based, targeted to E4 Soldiers, and focuses on the Army-wide core assessment.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA440050>

SR 2006-02

The Army Training and Leader Development Panel Report: Consolidation Phase. (2005). Fallesen, J.J., Keller-Glaze, H., Aude, S.N., Mitchell, D.D., Horey, J., Gramlich, A., & Morath, R.A. (DTIC No. ADB314354 / Restricted).

SR 2006-03

Advanced Individual Training Command and Cadre Perceptions and Attitudes Concerning the Training Soldiers Receive in Basic Combat Training. (2006). Marshall-Mies, J.C., Lupton, T., Hirose, C., Elczuk, C., Turner, A., & Brady, E. (DTIC Nos. ADB326117 [Report]; ADM201990 [CD-ROM] / Restricted).

SR 2006-04

Evaluating the Contributions of Virtual Simulations to Combat Effectiveness. (2006). Jones, P.N., & Mastaglio, T.W. (DTIC No. ADA448151).

The problem under investigation was the evaluation of virtual simulations to combat effectiveness for two separate populations: U.S. Army, heavy combat units returning from Operation Iraqi Freedom and U.S. Army National Guard heavy combat units. The research used opinion data collected via questionnaires delivered to battalion through platoon leadership. Questionnaires were delivered via physical interviews and written survey and through web delivered surveys. Individual opinions were aggregated based upon duty position and other demographic factors to develop collective opinions, which allowed analysts to make supported observations. Results are reported separately for Iraqi Freedom units and National Guard units. Significant findings include: virtual simulations are effective but are seen as a substitute to live training; users would prefer higher operational area modeling in virtual trainers so they can use them more as theater/mission rehearsal tools.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA448151>

SR 2006-05

Evaluation of the U.S. Army Training & Doctrine Command Warrior Transition Course. (2006). Campbell, R.C., Ford, L.A., & Ervin, K.S. (DTIC No. ADA448189).

This was an assessment of the Warrior Transition Course (WTC) training program designed to provide initial entry training under the Blue to Green (B2G) recruiting program. The analysis was performed by ARI at the request of the U.S. Army Training and Doctrine Command (TRADOC). The assessment had four objectives: (1) provide a detailed overview of the WTC program and its participants, (2) prepare electronic databases of survey data, (3) conduct a comparative analysis of WTC and basic combat training (BCT), and (4) provide results of the assessment to include recommendations. A case study method was used and input was gathered by observations, interviews, surveys, and documentation reviews. Ten specific findings about the course were provided along with selected recommendations. Findings were: (1) Most WTC attendees were prior service, not transfers on active duty. (2) BCT and WTC were not comparable activities. (3) There was significant Soldier dissatisfaction in WTC. (4) Soldiers were not accurately informed about WTC prior to attendance. (5) Physical demands predominate WTC issues. (6) WTC was too short. (7) Leadership training was a concern. (8) Administrative issues detracted from training. (9) Use of Drill Sergeants was controversial. (10) WTC will change when the course is transferred.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA448189>

SR 2006-06

Pilot Study to Examine Training Eligibility Standards. (2006). Williams, E.S., & Greenston, P.M. (DTIC No. ADA455120).

The aim of this pilot study is to examine training enlistment standards utilizing Army Training Requirements and Resources System (ATRRS) training data which records individual-level training events for all MOS, but is limited to pass / fail outcomes. Specifically, we seek to investigate the tradeoffs between training eligibility and Advanced Individual Training (AIT) completion brought about through lowering / raising minimum enlistment training standards, and to develop methodologies which can be utilized to assist school proponents in assessing the appropriateness of their Aptitude Area (AA) cut scores. For the initial effort in this pilot, the 50 MOS investigated belonged to a handful of school proponents who expressed an interest in the objectives of this study, plus a few additional ones recommended by Army Accessions Command. Subsequently, an additional 30 MOS that promised sufficient numbers of (failure) observations were also included. The authors specify and estimate binary logistic regression models of pass / fail training outcomes over the 2001 – 2004 period. Training outcome is estimated as a function of AA governing composite, Soldier demographic, and component membership variables. The estimated models are then applied to the larger Army enlisted contract population to examine the policy tradeoffs. For select MOS, the policy analyses are examined more closely using risk analysis simulation methods.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA455120>

SR 2006-07

Effects of Motion on Skill Acquisition in Future Simulators. (2006). Bowen, S.A., Oakley, B.P., & Barnett, J.S. (DTIC No. ADA452066).

In order to develop recommendations for the use of motion in ground vehicle simulators, a thorough literature review was conducted. Literature on motion cueing theories as well as basic and applied research in the use of motion in simulation was examined. A particular focus was paid to research on the effects of motion cueing on transfer of training from both ground vehicle and aircraft simulators. From the information gathered in the literature reviews on motion cueing, recommendations for the use

of motion in ground vehicle training simulation were developed. In addition to motion cueing factors, theories and applied research on motion sickness were also investigated. As motion sickness holds the potential to significantly affect performance both in a simulator and in an actual ground vehicle, it was considered important to develop recommendations for the use of simulator motion to mitigate these effects. Guidelines were developed from the information gathered in this review for the use of simulator motion in training to diminish the effects of motion sickness.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA452066>

SR 2006-08

Incorporating Lessons Learned into the Army Competency Assessment Prototype. (2006).

Moriarty, K.O., Knapp, D.J., & Campbell, R.C. (DTIC No. ADA452065).

The PerformM21 research project addressed the Army's need to adapt to the requirements of operations in the 21st century. The Incorporating Lessons Learned into the Army Competency Assessment Prototype (Lessons Learned) analyses is a subpart of the PerformM21 work and is discussed in this report. Specifically, Lessons Learned is concerned with incorporating tasks and knowledge that emerged from recent deployments into the standard Army-wide Common Tasks hierarchy. To this end, a prototype job analysis survey and test blueprint were developed, resulting in a process that is transportable to an operational program. Lessons learned sources were located, and challenges noted with them were discussed (e.g., locating Army-approved doctrine). Finally, new items were developed based on this lessons learned content. These items, with further review and modification, could be used in an operational assessment.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA452065>

SR 2006-09

Assessment of the FY 2005 Basic Officer Leader Course. Phase II: Instructor Certification

Program and Single-Site Initial Implementation. (2006). Pleban, R.J., Tucker, J.S., Centric, J.H., Dlubac, M.D., & Wampler, R.L. (DTIC No. ADA460363).

This report documents the BOLC II cadre Instructor Certification Program (ICP) and the single-site initial implementation conducted during FY 05. BOLC entails a three-phase process of officer initial entry training. After Phase I (pre-commissioning), all lieutenants receive a common core program (Phase II) focusing on leadership, counseling, and fieldcraft in a hands-on, field intensive environment. Phase III focuses on branch-specific officer training. Training observations from the ICP indicated that a disproportionate amount of time was spent on individual skill training versus training the cadre on how to teach, coach, and mentor lieutenants. Critical soft skills training was either abbreviated or not conducted. The training focus of the single site implementation mirrored that of the ICP. The lieutenants' survey ratings showed significant improvements in how prepared they felt they were to lead a platoon in executing the Warrior battle drills and their confidence in executing the Warrior tasks following BOLC II. However, important gaps in leadership training were identified. Survey results showed that the BOLC II training did not meet the lieutenants' expectations of the course. Recommendations based, in part, on these findings, have resulted in noticeable changes in the next ICP and the two-site initial implementation. ARI will continue to monitor these changes and their effects on both cadre preparation and the quality of leadership training received by lieutenants during BOLC II.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA460363>

SR 2007-01

Immersive Simulation Training for the Dismounted Soldier. (2007). Knerr, B.W. (DTIC No.

ADA464022).

A study was conducted to document the need for immersive dismounted virtual Soldier and leader training and the available research evidence regarding the effectiveness of virtual training for training Soldiers and leaders in complex skills. A literature search of research reports, journal articles, and conference proceedings to identify evaluations and experiments related to the study topic of the training effectiveness of immersive virtual simulations was conducted. Particular attention was paid to an expended series of evaluations conducted by the Army R&D organizations during the period 1997 – 2005. The major findings are organized around the topics of training effectiveness, Soldier task performance, and advantages and disadvantages of immersive virtual simulations. Soldiers and small unit leaders report that their skills improve as a result of training in virtual simulations, and these self-reports by have generally, if informally, been confirmed by observers. While the simulators impose constraints on the performance of some Soldier activities, this should limit training effectiveness only if

those activities that cannot be performed in the simulator are not trained by other means.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA464022>

SR 2007-02

Increasing the Enlistment Bonus Cap and MOS Channeling Effects. (2007). Diaz, T.E., Ingerick, M., & Sticha, P.J. (DTIC No. ADA465682).

Faced with a difficult recruiting environment, the Army moved to increase the cap on recruiting bonuses from its current maximum of \$20K to \$40K. To understand the personnel management implications of raising the bonus cap, the current study estimated its projected impact on Army accessions, specifically applicants' job training and term-of-service (TOS) choices. Using an empirically-based Job Choice Model (JCM), based on actual applicant choice data taken from REQUEST transactions for the first quarter of FY 2005 ($n = 18,803$), we estimated the model and then simulated applicants' MOS-TOS choices under the existing bonus cap of \$20K and a raised bonus cap of \$40K. Results of our simulations indicated that the raised bonus cap could increase accessions, particularly among higher quality applicants, to higher priority MOS about 8-10%, on average, and to longer TOS by roughly 12-17%. At the same time, however, accessions to lower priority MOS are projected to drop about 2%. For Army personnel policy researchers, the methodology, estimates and results of the Job Choice Modeling (JCM) could be used in future efforts to model the impact of bonus policy on Army applicants' enlistment behavior.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA465682>

SR 2007-03

Assessment of the FY 2006 Basic Officer Leader Course. Phase II: Instructor Certification Program and Two-Site Initial Implementation. (2007). Pleban, R.J., Tucker, J.S., Centric, J.H., Dlubac, M.D., & Wampler, R.L. (DTIC No. ADB327785 / Restricted).

SR 2007-04

Identifying and Assessing Interaction Knowledge, Skills, and Attributes for Future Force Soldiers. (2008). Bowden, T., Keenan, P.A., Ramli, M., & Heffner, T.S. (DTIC No. ADA478702).

Developed in response to a U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) SBIR request, the Army Interpersonal Skills Assessment (AISA) battery consists of five measures designed to evaluate the interpersonal knowledge, skills and attributes (KSA) that will be required of Soldiers in the Future Force. As the Army evolves over the coming years, Soldiers will be placed in positions that require increasing interaction effectiveness. The goal of the AISA is to gauge the Soldier's aptitude to effectively manage interpersonal interactions and to identify Soldiers who may be well suited for positions where effective interpersonal KSAs may improve performance. In Phase II of this SBIR effort, the AISA battery underwent a full development cycle including focus group reviews by senior Noncommissioned Officers (NCOs), and pilot and field testing with the target population of first term Soldiers. The final activity in the Phase II effort was a concurrent validation where data were collected from 95 Soldiers and their supervisors in an attempt to determine the predictive ability of the AISA battery.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA478702>

SR 2007-05

U.S. Army Classification Research Panel: Conclusions and Recommendations on Classification Research Strategies. (2007). Campbell, J.P., McCloy, R.A., McPhail, S.M., Pearlman, K., Peterson, N., Rounds, J., & Ingerick, M. (DTIC No. ADA469725).

As the U.S. Army transforms to meet the needs of the future force, the importance of classifying recruits to entry-level jobs will only increase, as will research to enhance the classification process (e.g., development and validation of non-cognitive predictors). A critical component to ensuring the success of this research, and its implementation, is having meaningful and reliable criterion data. Since the late 1980s, however, collecting criterion data for a sufficient number of jobs to meet the Army's classification research needs has proven a challenge. To find solutions to this challenge, the U.S. Army Research Institute (ARI) contracted with the Human Resources Research Organization (HumRRO) to convene a six-member Classification Research Panel. Overall, the Panel recommended that the solution to this challenge ultimately rests on (a) a solid, job analysis system, (b) a method for generalizing (or transporting) validity information across MOS (i.e., for the purposes of estimating classification efficiency for the entire system), and (c) a supporting relational database that collects and stores

occupational/job analysis and other relevant data (e.g., criterion-related validity estimates) over time. This report summarizes the Panel's recommendations.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA469725>

SR 2007-06

Assessment of the New Basic Combat Training Program of Instruction. (2007). Wampler, R.L., James, D.R., Leibrecht, B.C., & Beal, S.A. (DTIC No. ADB331403 / Restricted).

SR 2008-01

Cross-Cultural Competence in Army Leaders: A Conceptual and Empirical Foundation. (2007). Abbe, A., Gulick, L.M., & Herman, J.L. (DTIC No. ADA476072).

Military operations increasingly require Army leaders to anticipate the actions of, interact with, and influence individuals and groups whose cultural context differs widely from their own. The Army and other Services have responded by increasing the availability of language and regional training. These efforts develop the knowledge and skills needed to understand and interact with a particular population in a particular location. However, full-spectrum operations demand a broader cultural capability, whereby Army leaders are able to adapt successfully to any cultural setting. Meeting this capability will require the development of culture-general knowledge and skills as a necessary complement to language skills and regional knowledge. This report presents a framework for cross-cultural competence in Army leaders, reviews empirical research on predictors of intercultural effectiveness, and describes existing measures of cross-cultural competence and related constructs.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA476072>

SR 2008-02

Longitudinal Junior Noncommissioned Officer Promotion Analysis. (2007). Sager, C.E., Sun, S., Putka, D.J., Owens, K.S., & Heffner, T.S. (DTIC No. ADA476023).

The Noncommissioned Officer (NCO) Promotion effort was undertaken to help the U.S. Army prepare noncommissioned officers to meet the needs of the future Army. In the earlier NCO21 project, concurrent validation evidence was collected to support the integration of measures of knowledges, skills, and aptitudes (KSAs) into the promotion system. This report documents the longitudinal validation of these measures. The predictor measures included the Leadership Judgement Exercise, Self-Description Inventory, Information Questionnaire-II, Experience and Activity Record, Work Suitability Inventory, and Personnel File Form. Observed and expected future performance rating scales were used to remotely collect criterion data via the Internet a little more than a year later. An additional criterion measure was whether participating Soldiers had been promoted during the project's research period. This project yielded some evidence supporting the longitudinal validity of the predictor measures and good evidence that the measures can effectively be administered via laptop computers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA476023>

SR 2008-03

Attitudes and Career Intentions of Active Army Soldiers Without a Global War on Terrorism Deployment. (2007). Nourizadeh, S.M., Howard, C.R., Sims, C.S., Peterson, M., Steinberg, A.G., Knoblauch, K.B., Helmick, J., Golembiewski, G., Franklin, M., Hintze, W., & Elton, R.M. (DTIC No. ADB353088 / Restricted).

SR 2008-04

Building Cultural Capability for Full Spectrum Operations. (2008). Abbe, A. (DTIC No. ADA478179).

This report describes findings and recommendations from a research-based analysis on increasing linguistic and cultural capability in Army leaders and Soldiers. Findings from a workshop and literature review strongly support the role of culture-general skills and affect. In particular, interpersonal skills, non-ethnocentric attitudes, and openness emerged from workshop discussions and the literature as some of the most consistent contributors to success in cross-cultural settings. Workshop discussions also emphasized that cultural capability must be addressed throughout DOTMLPF and recommended that culture be incorporated at all levels of training and education. Findings from this analysis have contributed a research perspective to the development of a culture and language strategy at TRADOC. This research can further be used in identifying and prioritizing learning domains for education, training and leader development. Findings point to areas where existing training can be strengthened and to gaps that future training and education can address.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA478179>

SR 2008-05

Program Evaluation Metrics for U.S. Army Lifelong Learning Centers: Extension to Military Operational Specialty Based Lifelong Learning Centers. (2008). Cianciolo, A.T. (DTIC No. ADA484620).

Lifelong Learning Centers (LLCs) are the physical instantiation of the Army Training and Doctrine Command's (TRADOC's) lifelong learning concept. Previous research by the Army Research Institute for the Behavioral and Social Sciences (ARI) established a framework for assessing the effectiveness of LLCs. The present investigation sought to examine the generalizability of the LLC Assessment Framework and to apply the framework to assessing the Fort Gordon LLC. This effort also examined the requirements for enabling LLC self-assessment. Some modification to the assessment framework was necessary to include external factors that moderate the relation between outputs and outcomes. The assessment of the Fort Gordon LLC revealed that, overall, the outputs necessary to achieve educational transformation and impact were produced by the LLC staff and affiliated stakeholders. It was determined that people knowledgeable of educational theory and technology and capable of having extensive face-to-face contact with LLC stakeholders will be necessary for LLC self-assessment..
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA484620>

SR 2008-06

Transfer and Generalizability of Foreign Language Learning. (2009). Abbe, A. (DTIC No. ADA495037).

Knowing a foreign language provides an advantage for understanding, working in, and building relationships with a particular language community. However, military personnel can expect to encounter multiple languages in their operational experiences over a career. Thus, it is important to understand what impact learning a foreign language has beyond its applications with a specific population. This report reviews research on the extent to which foreign language proficiency facilitates further language and cultural learning. Empirical research shows relationships among language learning and intercultural and language-related outcomes, but evidence for a direct causal contribution is lacking. In children, knowing a second language develops metalinguistic awareness, which can contribute to further language learning. However, other factors limit the degree of proficiency that can be expected. Evidence of benefits for cross-cultural attitudes and behavior is similarly scarce. The likely impact of language education and training on adults is therefore unknown, particularly for personnel who lack intrinsic motivation or language aptitude, or who hold negative attitudes about the language community. General characteristics such as intercultural sensitivity and interpersonal skills have been shown to contribute more to outcomes than do language skills. Evidence is currently insufficient to view language as the cornerstone of cultural capability.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA495037>

SR 2008-07

Assessment of Drill Sergeant Candidates' Experience and Training with Warrior Tasks and Battle Drills. (2008). Beal, S.A., Dyer, J.L., James, D.R., Wampler, R.L., & Johnson, V. (DTIC No. ADB347388 / Restricted).

SR 2009-01

Investigation of the Ten Week Basic Combat Training Pilot Program: FY 2008. (2009). Dyer, J.L., Tucker, J.S., Wampler, R.L., & Blankenbeckler, P.N. (DTIC No. ADB350050 / Restricted).

SR 2009-02

Best Practices for Using Mobile Training Teams to Deliver Noncommissioned Officer Education Courses. (2009). Morey, J.C., Bush, M.D., Beebe, R., McPhail, S.M., & Bickley, W.R. (DTIC No. ADA500349).

As part of Noncommissioned Officer Education System implementation, U.S. Army Training and Doctrine Command (TRADOC) schools have begun delivery of Phase 2 of Basic Noncommissioned Officer Courses (BNCOC) by mobile training teams (MTT). To provide input for emerging TRADOC MTT guidelines and policies, this effort identifies current BNCOC MTT best practices, proposes future best practices, and provides a notional timeline for conducting a BNCOC MTT. Best practices were developed from interviews with BNCOC graduates, personnel from proponent schools responsible for BNCOC training, and supervisors of MTT-trained noncommissioned officers.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA500349>

SR 2009-03

Warrior Task Skills Retention Assessment. (2009). Cobb, M.G., James, D.R., Graves, T.R., & Wampler, R.L. (DTIC No. ADB353611 / Restricted).

SR 2009-04

The Impact of Basic Noncommissioned Officer Course Attendance on Promotion Timing. (2009). Bink, M.L., James, D.R., & Thomas, A.M. (DTIC No. ADA496204).

World events and current promotion policies have created conditions where many noncommissioned officers (NCOs) cannot attend NCO education system (NCOES) courses at the desired points in their careers. The U. S. Army Training and Doctrine Command requested ARI investigate whether on-time attendance at NCOES courses impact promotion and retention of NCOs. In this research, the timing of basic NCO course (BNCOC) completion was analyzed on two outcome measures: the duration of enlistment after completion of BNCOC and the timing of promotion to Sergeant First Class (SFC). Overall, the timing of BNCOC completion was related to longer delays in promotion to SFC but not related to the probability of being promoted to SFC. More importantly, the relation between BNCOC completion and promotion timing changed as the global war on terrorism (GWOT) progressed. The relation was weakest during periods of highest NCO demand in GWOT, but the relation has strengthened in the most recent years. These changes corresponded with changes in NCO promotion policy that occurred during GWOT. In short, delays in NCOES attendance had an impact on SFC promotion when NCOES was stressed in the promotion policies, and NCOES delays had little impact on promotion when NCOES attendance was not stressed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA496204>

SR 2009-05

Noncommissioned Officer Education System: Considerations for Testing Out and Awarding Equivalent Credit. (2008). Wampler, R.L., & Blankenbeckler, P.N. (DTIC No. ADA495610).

This research examined the viability of allowing noncommissioned officers (NCOs) to receive NCO Education System (NCOES) credit based on experience or testing-out. Surveys and interviews were completed with 164 participants, varying in rank from Lieutenant Colonel to Staff Sergeant. Participants were serving in duty positions ranging from U.S. Army Training and Doctrine Command School Leaders and staff to actual NCO and Officer course instructors, at six Army installations representing 11 Schools. The majority (58%) agreed that testing-out of selected NCOES content is a viable option and 61% agreed that no credit should be awarded solely for experience. An overwhelming majority (90%) agreed that all NCOs should attend some resident NCOES classes to foster interpersonal relationships, 86% agreed that testing-out should include both hands-on and written components, and 85% agreed that all NCOs, active and reserve, should be handled the same concerning testing-out or receiving equivalent credit. Perspectives differed by rank group and duty position. Participants identified numerous educational, administrative, logistical, and sociological items that could be negatively impacted by testing-out. They also suggested some testing-out procedures that might mitigate potential impacts.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA495610>

SR 2009-06

Initial Development and Validation of Assessments for Predicting Disenrollment of Four Year Scholarship Recipients from the Reserve Officer Training Corps. (2009). Putka, D.J. (DTIC No. ADA495510).

The Reserve Officer Training Corps (ROTC) is an essential commissioning source for the U.S. Army. ROTC has recently produced the majority of the Army's new Officers and yields Officers that eventually reach the highest ranks. Analyses have indicated that Officers graduating from the four-year ROTC scholarship program tend to be more likely than their non-scholarship ROTC, U.S. Military Academy (USMA), and Officer Candidate School (OCS) counterparts to leave after their initial Active Duty Service Obligation (ADSO). Furthermore, relative to non-scholarship Cadets, four-year scholarship Cadets tend to be less likely to complete the ROTC program and become commissioned Officers. Data collected for the current project showed that approximately 10.3% of four-year scholarship freshmen in 2007 disenrolled between their freshman and sophomore years. The primary purpose of the current project was to develop and validate a new measure that would improve the prediction of ROTC continuance for four-year scholarship recipients. The long-term objective of this project is to provide the foundation for future longitudinal research that examines the impact of the new measures for predicting ROTC program completion, commissioning, and career continuance in the Army. This report describes the development

of the Cadet Background and Experience Form (CBEF) and its initial validation for predicting disenrollment criteria.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA495510>

SR 2009-07

Evaluating the Enlisted Aides Selection Assessment: Final Report. (2009). Waugh, G.W., Hoffman, R.R.III, Allen, M.T., Mathew, J., & Muraca, S.T. (2009). (DTIC No. ADB348852 / Restricted).

SR 2009-08

Identifying Incentives to Increase the Retention of Army Medical Department Clinicians. (2009). Duehr, E.E., Cochran, C.C., Schneider, R.J., Muros, J.P., & Johnson, J.W. (DTIC No. ADB355195 / Restricted).

SR 2009-09

Influences on the Retirement Decision Making Process of Noncommissioned Officers. (2009). Ramsberger, P.F., Campbell, R.C., & Dressel, J.D. (DTIC No. ADB353506 / Restricted).

SR 2010-01

Impact of Game Based Training on Classroom Learning Outcomes. (2010). Topolski, R., Leibrecht, B.C., Cooley, S., Rossi, N., Lampton, D.R., & Knerr, B.W. (DTIC No. ADA531677).

The research presented here compares current training methods with the application of game-based training (GBT) for selected tasks in an institutional environment (classroom/garrison setting). This report focuses on the effectiveness of game-based simulations for training, as well as identification of strategies and methods for implementing such simulations. Multiple measures were obtained during two Advanced Leaders Courses: a biographical survey, multiple-choice pre-test and post-test, feedback questionnaires, hotwashes and group interviews, and observations during assessment events (e.g., terrain board testing, Close Combat Tactical Trainer exercises). Support for the effectiveness of GBT was found. The GBT group performed better on the post-test than the No-GBT group in one of the two courses. Both courses exhibited improvement from pre- to post-test, indicating that the course was effective in increasing Soldiers' knowledge. The research team received valuable feedback on how to best employ GBT in the courses studied as well as in other institutional programs.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA531677>

SR 2010-02

Game Based Training Effectiveness Evaluation in an Operational Setting. (2010). Ratwani, K.L., Orvis, K.L., & Knerr, B.W. (DTIC No. ADA530660).

With high operational tempo and increasingly complex operational environments, the U. S. Army is increasingly using game-based training as a lower cost and more time-effective training method for both individual and collective training of tactical skills. However, there has been little empirical evidence to demonstrate the effectiveness of game-based training and to help leaders make decisions about their use. In response to the need for more evidence regarding the effectiveness of game-based training (GBT), an evaluation of training games supported by Virtual Battle Space 2 (VBS2): U.S. Army was conducted in operational settings. This report describes the methods, measures, and results of an evaluation with 165 Soldiers participating in GBT. Pre- and post-measures were administered that focused on measuring training effectiveness through individual level (e.g., task performance) and unit level (e.g., unit effectiveness) outcomes. Results demonstrate that, in general, the training influenced both individual (e.g., task performance) and unit level (e.g., unit cohesion) outcomes. In addition, situational characteristics (the amount the unit prepared for the training and the level of leader involvement during the training) influenced both types of outcomes.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA530660>

SR 2010-03

Distributed Learning in Foreign Language Education: Principles, Best Practices, and Approaches to Evaluation. (2010). Menaker, E.S., & Tucker, J.S. (DTIC No. ADB364652 / Restricted).

SR 2011-01

Identification and Accessioning of Individuals for the Officer Candidate School. (2011). Oliver, J., Ardison, S.D., L. Russell, T.L., & Babin, N.E. (DTIC No. ADA539327).

The "AccessOCS" project was a qualitative study designed to (a) identify and describe Officer Candidate School (OCS) applicants in terms of motivations, backgrounds, and incentives; (b) identify how the OCS selection and application process works, and (c) develop recommendations for improving the OCS accessioning process. The research approach was to conduct focus groups and one-on-one interviews with a number of personnel, e.g., sponsors, applicants, government officials, to learn about the OCS accessioning process from several vantage points. These individuals included: OCS candidates; OCS instructors, cadre, and Company Commanders; Basic Officer Leadership Course B (BOLC B) lieutenants; Captain's Career Course (CCC) officers; recruiters; and policy-level government officials. Content analysis of the interviews and focus groups revealed the following key findings: findings substantiated the fact that OCS candidates express a desire to serve and a commitment to the Army; OCS application procedures can be difficult for applicants to understand and utilize; a standardized, stored database management system for tracking officer candidates and their performance is lacking; officer candidates could be better prepared for OCS; and the review board process is decentralized. Issues surrounding the branch assignment are discussed. Several recommendations for improvement are presented.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA539327>

SR 2011-02

Identification of Brigade Command Competencies. (2011). Wolters, H.M., O'Shea, P.G., Ford, L.A., Fleisher, M.S., Adeniyi, M.A., Conzelman, C.E., & Webster, R.J. (DTIC No. ADA548193).

The nature of leadership at the Brigade Command level has transformed in recent years, as many of the functions that were Division-level responsibilities have been pushed down to the Brigade. This research identified the competencies required for successful performance in this transformed environment. Twenty-one interviews with current and former Brigade Commanders, Brigade Staff, Brigade Command Sergeants Major, and former Division Commanders helped refine a preliminary competency list. Subsequent survey results from 64 current Brigade Commanders provided data addressing (a) the proficiency level needed for each competency, (b) the extent to which each competency differentiated among superior and less effective Brigade Commanders, and (c) the extent to which each competency is fostered in pre-command training education. Ultimately, this research identified 39 competencies that could be categorized in four competency training clusters: leadership skills, operational skills, personal capabilities, and knowledge base. The survey also identified optimal methods to train each competency type. The Brigade Command Competency Model clarifies the leadership and command competencies required at this command level and can be used to help assess training effectiveness and identify training gaps that may exist.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA548193>

SR 2014-01

Collective Leadership Measurement for the U.S. Army. (2014). Yammarino, F.J., Mumford, M.D., Vessey, W.B., Friedrich, T.L., Ruark, G.A., & Brunner, J.M. (DTIC No. ADA596962).

The U.S. Army faces a difficult and challenging context today. To help meet these challenges, we propose the Army looks beyond traditional, individual-level approaches to leadership to include a collective leadership framework. A conceptualization of collective leadership is presented that is multi-level in nature, builds on a foundation of general leadership concepts, includes communication as a core element, is team- and network-based, and considers both hard and soft criteria and situational moderators applicable to individual leaders, squads, platoons, companies, battalions, and brigades. The fundamentals of a new measurement system for collective leadership are then developed. Viable measures of various aspects and dimensions of the collective leadership conceptualization are constructed using markers, surveys, interviews, critical incidents, and policy capturing scenarios to begin a multi-level assessment of collective leadership for the Army. Measurement instruments are provided as a part of this report.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA596962>

Study Notes

SN 2000-01

Factors for Determining the Army's Role in Supporting Military Occupational Specialty Design / Redesign. (1999). Akman, A. (DTIC No. ADA369938).

Since 1989, the Army Research Institute (ARI) has engaged and sponsored research aimed at developing methods and techniques that can be used to design or re-design Military Occupational Specialties (MOSSs). Recently, no systematic review had been undertaken nor were there any current data that could be used to determine the extent to which there is an Army-wide need for continued research and technical assistance. During spring 1997, ARI sponsored a series of field visits to enlisted personnel proponent offices at which data were gathered about current MOS design/re-design practices. Proponent Offices were visited at Aberdeen Proving Ground, Fort Bliss, Fort Gordon, Fort Knox, Fort Lee, Fort Sam Houston, and Fort Sill. This report is based on the data collected and describes the need for research, the target audience, and the potential payoffs. The appendices provide a summary description of current Army MOS design/re-design practices as well as a summary of the data collected from each proponent.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA369938>

SN 2001-01

The Effect of Reducing the Number of Tests in the Armed Services Vocational Aptitude Battery. (2000). Zeidner, J., Johnson, C., Vladimirovsky, Y., & Weldon, S. (DTIC No. ADA385138).

The major goal of this research is to determine the effect on ASVAB classification efficiency of dropping the Numerical Operations (NO) and Coding Speed (CS) tests from the battery. If it could be shown that removing either or both of these tests would not significantly reduce the mean predicted performance (MPP) of ASVAB classification or would not affect gender and racial fairness of the battery, then removing these tests would become defensible. Two data sets were used. The first set consisted of 150 job families containing 260,000 first-tour enlistees, and the second set (a subset of the first) consisted of 66 job families containing 83,000 observations. The criterion data were Skill Qualification Test (SQT) data from FY1987-89. Findings indicate that a significant loss in MPP would be incurred by reducing the 9-test battery to a 7-test battery by removing NO and CS. The loss is 6.2 percent for the 150 job family data set and 8.1 percent for the 66 job family data set. The loss incurred from dropping NO is much less than from dropping CS, but the combined loss of dropping both tests is significantly greater than dropping either test alone. Dropping NO and CS would result in a greater loss of MPP for females than for the total sample. Dropping the two tests would not only increase gender unfairness of the battery, but would significantly reduce the accuracy of performance prediction for females. The pattern of loss for blacks is not as clear.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA385138>

SN 2002-01

Update of U.S. Army Research Institute's Officer Personnel Research Databases (1999 — 2000). (2002). Young, W. (DTIC No. ADA403182).

This document describes the procedures performed to add 1999 and 2000 personnel data to the Longitudinal and Core data sets of the Officer Longitudinal Research Data Base (OLRDB) and the Core Data Set of the Officer Standardized Educational Testing Data Base (OSETDB). These data sets, which were designed for research purposes, contain historical and current data on U. S. Army Officer personnel. The OLRDB contains career history data primarily from the 1979 through 2000 Officer Master Files (OMF) and the Separation Officer Master Files (SOMF). A secondary data source was included to record early separations due to incentive programs. These data were captured from the Voluntary Separation Incentive/Special Separation Benefit (VSI/SSB) file. The OSETDB contains academic measures for officer personnel commissioned between 1980 and 1990 in the form of standardized scores. The testing data consists of the Scholastic Aptitude Test (SAT) from the Educational Testing Service and the American College Test (ACT) from the American College Testing Program for the academic years 1973 through 1985.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA403182>

SN 2002-02

Investigations Related to the Implementation of the Assessment of Individual Motivation. (2002). Knapp, D.J., Waters, B.K., & Heggstad, E.D. (DTIC No. ADB282977 / Restricted).

SN 2003-01

Evaluation of the Buddy Team Assignment Program. (2002). Ramsberger, P.F., Legree, P.J., & Mills, L.J. (DTIC No. ADA408486).

All Infantry Soldiers are assigned a battle buddy during One Station Unit Training (OSUT). In 2000, a pilot program was initiated in which some buddy pairs were also assigned together to their first operational units. The hope was that a familiar face would lessen the stress associated with making this transition, and thereby lower attrition rates. During the pilot period, Soldiers with Military Occupational Specialty 11M (Fighting Vehicle Infantryman) were either assigned to the Buddy Team Assignment Program (BTAP) or designated as controls for research purposes. Over a 3-month period, Soldiers at Fort Benning, GA were surveyed just before graduating from OSUT and asked a variety of questions about their experience, particularly focusing on their battle buddies. Parallel surveys were administered to BTAP and control Soldiers in the field. Results showed that battle buddies had a highly positive impact during OSUT and were generally well liked. This impact was reduced once Soldiers were in the field, although there was still greater evidence of a positive than a negative impact. The results suggest that the degree to which Soldiers like one another and the level at which they are assigned together (e.g., squad, platoon) have a major impact on program outcomes.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA408486>

SN 2003-02

Determining Composite Validity Coefficients for Army Families. (2002). Zeidner, J., Johnson, C., Vladimirovsky, Y., & Weldon, S. (DTIC No. ADA409870).

The broad goal of the present research (and the first study completed in response to the 2001 Expert Panel recommendations) is to compute composite validity coefficients, using criterion data derived from the 1987 - 1989 Skill Qualifications Test program, for the 7-test ASVAB for 150, 17, and 9 job family structures. These are the structures underlying ongoing classification research.

The specific research objectives are as follows:

1. To compute the 7-test ASVAB LSE (least squares estimate) composite validity coefficients for the first-tier 150 job family structure. These correlation coefficients are corrected, first, for unreliability of the criterion and, then, for restriction in range effects due to assignment from an Army input population to MOS samples. The coefficients are computed for both back (biased) and cross (unbiased) validities of LSE composites.
2. To compute ASVAB composite validity coefficients for the youth population in the 150 job family structure. This involves a correction for the Army input and then a separate restriction in range correction due to selection from the youth population into the Army. Again, the coefficients are computed for both back and cross validities.
3. To compare mean validity coefficient results obtained for the 150 job families with those obtained earlier for the 66 MOS families. Although there was a substantial overlap in MOS between the two data sets, the 66 MOS study was computed on data that was collected several years earlier than was the 150 family studies.
4. To compute the weighted aggregation of test composite validity coefficients for the aggregated MOS corresponding to each of the 17 job family composites of the second tier and for each of the 9 (interim) composites. Validities are first corrected for the Army input population and then corrected for the youth population for both back and cross samples.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA409870>

SN 2003-03

Determining Mean Predicted Performance for Army Job Families. (2003). Zeidner, J., Johnson, C., Vladimirovsky, Y., & Weldon, S. (DTIC No. ADA410612).

The present study is designed to obtain mean predicted performance (MPPs) for the 9- and 17-job families, using composites based on 7 ASVAB tests, using a triple cross-validation design permitting completely unbiased estimates of MPP. While the authors have previously computed MPPs for 9 and 17 family composites, they have not been computed for composites that have had all hierarchical effects removed by a transformation to the Army conventional standard score (ACSS) scale (with its use of equal means and equal standard deviations).

The specific research objectives are as follows:

1. To compute regression weights for the 7 ASVAB tests to form assignment composites corresponding to the two alternative second-tier structures (9 or 17 families) and to determine the classification

efficiency in terms of MPP that would result from the use of all positive weights and the conversion of the composite scores into the ACSS scale. Weights are corrected first for unreliability of the criterion and, then, for restriction in range effects due to assignment from an Army input population to MOS samples. The weights are applied to test scores of independent samples to obtain back (biased) and cross (unbiased) MPPs.

2. To obtain MPPs for the two sets of job families for the youth population as described in (1) above. This involves a correction due to assignment from the Army input population into Army jobs, and then a separate restriction in range correction due to selection from the youth population into the Army.

3. To compare MPPs for the two sets of job families for the Army Input/youth populations.

4. To evaluate the relative value of the two sets of job families taking into account MPPs and composite validity coefficients, used in establishing cut scores for the ACSS scale.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA410612>

SN 2003-04 — Cancelled

SN 2003-05

Impact of the Army Continuing Education System on Soldier Retention and Performance: Database Development. (2003). DiFazio, A.S., & Sticha, P.J. (DTIC No. ADA415293).

The Army Continuing Education System (ACES) provides education, training, testing, and counseling opportunities to tens of thousands of service members each year. The mission of ACES is to promote lifelong learning opportunities that sharpen the competitive edge of the Army by providing and managing quality educational programs and services. The Total Army Personnel Command (PERSCOM), the developers and administrators of ACES, has requested an evaluation to demonstrate the value of ACES to the Total Army. This evaluation consists of two phases. The first phase involved the development of detailed database and evaluation plans. Phase two involves the implementation of the database and evaluation plans. This report describes the data development portion of the phase two effort, which resulted in a comprehensive longitudinal evaluation database. The report presents an overview of the data structure summarizes the activities by which the database was constructed, and discusses some of the lessons learned in the development process.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415293>

SN 2003-06

Impact of the Army Continuing Education System on Soldier Retention and Performance: Plan Development. (2003). Sticha, P.J., DiFazio, A.S., Dall, T.A., Handy, K., & Heggstad, E.D. (DTIC No. ADA415299).

The U.S. Total Army Personnel Command requested an evaluation of the Army Continuing Education System (ACES) to demonstrate its value in improving enlisted Soldier retention and performance. This report describes the planning of the evaluation, including a review of the relevant research literature and the development of evaluation and database development plans. The research literature provides limited coverage of continuing education programs. Results indicate that those who participate in continuing education tend to be better qualified than those who don't. The research suggests that participation in continuing education increases the likelihood of reenlistment and improves performance. The effect remains at a reduced magnitude when other factors are controlled statistically. The evaluation plan addresses five ACES programs: (a) the Army Tuition Assistance (TA) Program, (b) the Service members Opportunity Colleges Army Degree (SOCAD) Program (c) the Functional Academic Skills Training (FAST) program, (d) Military Occupational Specialty (MOS) Improvement Courses, and (e) Noncommissioned Officer (NCO) Leader Development Courses. The methodological approach addresses several potential evaluation problems, including non-random assignment, censored data, missing data, measurement error, and unobserved heterogeneity. The database development plan specifies the variables needed to conduct the evaluation, and identifies data-building procedures that will result in an analytically relevant evaluation database.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA415299>

SN 2004-01

Identifying and Assessing Interaction Knowledges, Skills, and Attributes for Objective Force Soldiers. (2003). Bowden, T., Laux, L., Keenan, P.A., & Knapp, D.J. (DTIC No. ADA418015).

The future force has defined the U.S. Army as it is expected to exist within the next 30 years (U.S. Army, 2001). The future force will be supported by Future Combat Systems (FCSs) that will improve the speed, maneuverability, fighting capacity, and survivability of the Army's combat operations.

Transformation to the future force obviously requires tremendous advances in technology to provide the FCSs that will enable the future force. Just as importantly, however, the Army recognizes the importance of its Soldiers in accomplishing the transformation, both in terms of making the transition and working effectively within the new systems. This transition will require future force Soldiers to possess unprecedented interpersonal skills in order to achieve success in their new unit structures. The goal of this Small Business Innovation Research Program (SBIR) Phase I effort was to identify the interpersonal knowledges, skills and attributes (KSAs) required of the future force Soldiers and identify innovative strategies for measuring those KSAs in future Soldiers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA418015>

SN 2004-02

Principles for Defining Multi-Skilled Jobs Based on Mission Requirements for Multi-Functional Units: The Multi-Skilled Soldier Job Modeler. (2003). Akman, A., & Nelsen, J.T. (DTIC No. ADA418185).

This report discusses principles for identifying and categorizing jobs requiring Multi-Skilled Soldiers (MSS). These principles provide insight to key questions that the Army must answer in developing MSS, including how to define MSS, what operational and organizational objectives are trying to be achieved, how MSS will impact Military Occupational Specialty (MOS) restructuring, among others. This process of identifying job requirements is an important element in the MSS Developmental Blueprint which can be used to define and assess potential MSS implementation and sustainment courses of action. This paper describes concepts for defining unit functional requirements, MSS job requirements, and methods to derive the latter from the former. These are organized into the MSS Job Modeler (MJM). MJM included explicit definitions of unit functional requirements and MSS job requirements. Basic principles for job and task analysis as well as principles attributable to developing MSS are identified. The MSS principles include: defining MSS jobs in terms of tasks, knowledge, skills, and abilities; developing MSS to enhance unit deployability, sustainability, lethality, mobility, and survivability; modifying existing job structures to reflect combined arms units, assessing MSS feasibility in terms of mental and physical workload, and addressing Army wide job structure issues.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA418185>

SN 2004-03

Understanding and Improving the Assessment of Individual Motivation in the Army's GED Plus Program. (2004). Knapp, D.J., Heggstad, E.D., and Young, M.C. (DTIC No. ADA420227).

The Assessment of Individual Motivation (AIM) test was developed by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to assess work-related temperament characteristics. In 2000, the Army implemented AIM as a new market-expansion enlistment screening tool under the "GED Plus" program. Under this program, non-high school diploma graduates who might otherwise be ineligible for military service can enlist if they score sufficiently high on the AIM and meet other program requirements. This project addressed several operational issues pertaining to AIM's ongoing use in the GED Plus program. Post-implementation investigations have included (a) a preliminary examination of the operational AIM's validity against attrition under the GED Plus program, (b) the scaling of AIM alternate forms, (c) an examination of variables that might be used to supplement AIM in the prediction of first-term attrition, (d) fairness analyses, and (e) efforts to develop improved ways to score the AIM.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA420227>

SN 2004-04

Fairness of Army ASVAB Test Composites for MOS and Job Families. (2004). Zeidner, J., Johnson, C., Vladimirovsky, Y., & Weldon, S. (DTIC No. ADA422165).

Major goals of this research are to evaluate the fairness to minorities of the new operational ASVAB seven test composites and to compare the seven test composites with the previously utilized nine test composites. The experiment evaluates fairness in predicting performance outcomes as measured by the actual SQT (Skill Qualification Test) scores of individuals assigned to MOS by the operational system. Fairness is measured by the difference between predicted performance and SQT scores across gender and race. Complete fairness is indicated by very small mean difference and fairness to minorities is present when mean difference in the minority group is zero or has a positive sign (over prediction). The sample uses ARI's data set of ASVAB scores limited to 66 MOS and SQT scores obtained during FY 1987-1989. The total sample size of first-term enlistees was 83,132. Findings indicate that the proposed new seven least squares estimate (LSE) test composites are comparatively fair to minorities. The results using seven test composites are comparable to the previous study using nine test composites.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA422165>

SN 2004-05

Update of U.S. Army Research Institute's Officer Personnel Research Databases (2001– 2002). (2004). Young, W.Y. (DTIC No. ADA425354).

This document describes the procedures performed to add 2001 and 2002 personnel data to the Longitudinal and Core data sets of the U.S. Army Research Institute's Officer Longitudinal Research Data Base (OLRDB) and to the Core Data Set of the Officer Standardized Educational Testing Data Base (OSETDB). These data sets were designed for research purposes and contain historical and current data on U. S. Army commissioned officer personnel. The OLRDB contains career history data primarily from the 1979 through 2002 Officer Master Files (OMF) and the Separation Officer Master Files (SOMF). The OSETDB contains academic measures for officer personnel commissioned between 1980 and 1990. In particular, the testing data includes Scholastic Aptitude Test (SAT) scores from the Educational Testing Service and American College Test (ACT) scores from the American College Testing Program for academic years 1973 through 1985.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA425354>

SN 2004-06

Comparison of Alternative Methods of Measuring ASVAB Test Composite Fairness. (2004). Zeidner, J., Johnson, C., Vladimirovsky, Y., & Weldon, S. (DTIC No. ADA425433).

The major objective of the present research is to compare the fairness measures obtained by the prediction error (PE) model with the Cleary model for female and black Soldiers utilizing the current Army aptitude area composites as predictors and Skill Qualifications Test (SQT) scores as the criteria. Fairness is traditionally defined as the absence of underpredictions for the minority groups that are considered potentially susceptible to discrimination. The Cleary model was chosen for comparison with the PE model because Cleary has been considered the "gold standard" of fairness measurement for more than three decades. The models are compared for selection and classification and evaluated by a common metric using the same robust Army database in a double cross-validation design permitting objective estimates of prediction fairness. The authors conclude that the results obtained for the PE and Cleary models are quite comparable for practical purposes for selection, but possibly not for classification. They find that the PE model is the better of the two because of the precision that comes with utilization and reliance upon individual test scores.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA425433>

SN 2004-07

Examining the Impact of ASVAB Renorming Upon Selection and Classification in the Army. (2004). Greenston, P.M. (DTIC No. ADA429938).

DOD will implement new norms for the Armed Services Vocational Aptitude Battery (ASVAB) in 2004. These norms will reflect the 1997 Youth Population, replacing the 1980 Youth Population norms currently in effect. The purpose of this Study Note is to document the descriptive analyses undertaken to examine the impact of the new norms upon selection and classification in the Army (Regular, Reserve, and Guard). The analyses were conducted with 2002 – 2003 test data denominated in both 1980 and 1997 scale scores. Under the new norms and existing Army selection standards, and in the absence of newly focused recruiting effort, we would expect some decline in the proportions of Test Score Category (TSC) 1-3A and 3B applicants, and some increase in TSC 4. This holds for all three components.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA429938>

SN 2005-01

Examining Training Eligibility Standards: Four Case Studies. (2004). Williams, E.S., & Greenston, P.M. (DTIC No. ADA427358).

The objective of the study was to examine the feasibility of putting the determination of MOS training eligibility standards (i.e., AA composite cutoff score levels) on firmer empirical footing. The key to establishing defensible cutoff levels is the estimation of empirical relationships between student training performance and AA composite scores. Accordingly, the authors estimated training performance relationships and utilized the estimated parameters to examine the impact upon training performance of changes in training eligibility standards, with the aim of identifying defensible standards. The authors specified and estimated binary logistic models based on course-level pass / fail data and regression models using overall student average data for four MOS. These criteria or dependent variables were

estimated as functions of AA governing composites and Soldier demographic variables. The authors found moderate correlations between student performance and AA composites, and relatively modest explanatory power of the estimated logistic and OLS regression models. The four MOS also illustrated the difficulties of the intended exploration. Advanced Individual Training (AIT) is closely managed; with the data available, it is not always possible to distinguish the better from the poorer students. In particular, it is difficult to accurately distinguish between failures to complete training due to academic versus non-academic reasons; there is not much variation in student training performance scores; and there would appear to be a lot of ongoing student remediation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA427358>

SN 2005-02

Results and Recommendations from a Survey of Army Deserters and Leaders. (2004). Ramsberger, P.F., & Bell, D.B. (DTIC No. ADA429371).

In 2001, the Army experienced over 4,500 cases of enlisted Soldier desertion, a rate more than double that of a decade prior. The Army G-1 requested that the U.S. Army Research Institute for the Behavioral and Social Sciences undertake a study to obtain a better understanding of why Soldiers desert and what can be done to prevent it. Accordingly, over 400 deserters who were returned to military control were surveyed about why they took unauthorized leave and how it could have been avoided. A sample of 241 Army supervisors completed a survey in which they provided information about a specific case of desertion with which they were familiar, as well as general opinions regarding AWOL and desertion. Among the findings were that most deserters leave without giving the move much consideration, many do not seek assistance before taking this step, and only about one quarter leave with no intention of returning. Deserters felt that receiving more information about Army life prior to entry and allowing more family contact may have prevented them from taking this step. Supervisors indicated that better screening of recruits and increasing the punishment for going AWOL may have helped prevent the desertions with which they were familiar.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA429371>

SN 2005-03

A Strategy to Produce Realistic, Cost-Effective Measures of Job Performance. (2005). Rosenthal, D.B., Sager, C. E., & Knapp, D.J. (DTIC No. ADA429413).

For most military occupational specialties (MOS), the Army lacks objective measures to assess the ability of Soldiers to perform the technical components of their jobs. The objective of this effort was to develop a methodology to produce realistic and cost-effective measures. Our team identified 11 viable types of assessment methods. Included were computer-based tests and simulations designed to create an engaging, virtual representation of an MOS. Participants in a clustering workshop used this list, descriptions of MOS, and other materials, to identify seven groups of MOS. Common to all MOS in a group was their suitability for assessment using a specific type of assessment. Our team developed a two-phased strategy for collecting job analysis information for each group. We provided strategies to reduce the costs of developing and implementing assessment methods. Finally, we developed tools to quantify the level of realism in measures. This effort demonstrates that MOS can be grouped into a few clusters for which the same type of assessment method can be used. Following our methodology, it should be possible to create a standard, streamlined approach to job analysis, test design, and test development for each group.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA429413>

SN 2005-04

Army Selective Reenlistment Bonus Management System: Functional and User Documentation. (2005). Mackin, P.C. & O'Brien, K. (DTIC No. ADA438308).

As part of a larger research project examining the behavioral effects of changes in selective reenlistment bonus (SRB) levels on reenlistments, ARI designed and developed a modeling system that permits users to project changes in the number of SRB takers and in program cost for alternative SRB plans. This report provides a functional description of the system's underlying algorithms and also includes user documentation for the two system components – the web-based Army SRB Model and the Data Utility.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA438308>

SN 2006-01

Concurrent Validation of the NLSI for U.S. Army Drill Sergeants. (2005). Kubisiak, U.C., Horgen, K.E., Connell, P.W., Xu, X., Borman, W.C., White, L.A., & Young, M.C. (DTIC No. ADA443021).

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) and its contractor Personnel Decisions Research Institutes, Inc. (PDRI) have been conducting research to validate the Noncommissioned Officer Leadership Skills Inventory (NLSI) as a predictor of Drill Sergeant performance. The NLSI measures skills and abilities related to NCO performance, including work orientation, interpersonal skills, and leadership capability. The overall goal is to expand the NLSI into a Noncommissioned Officer classification test to identify high potential Soldiers at the E-4/5/6 levels for several occupational specialties, including Drill Sergeants. The research conducted for this study consisted of a preliminary, small-sample validation of the current NLSI as a predictor of Drill Sergeant success as measured by performance ratings. Results indicate that the NLSI demonstrates preliminary, statistically significant predictive validity for Drill Sergeants. Further, this research supports the use of the NLSI as an operational test for NCO MOSs and duty assignments beyond recruiter. Future research should also guide potential refinement of the NLSI as a classification tool for multiple Army NCO positions.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA443021>

SN 2006-02 — Cancelled**SN 2006-03**

Evaluation of Alternative Aptitude Area Composites and Job Families for Army Classification: A Reply. (2006). Johnson, C., & Zeidner, J. (DTIC No. ADA445466).

Differential assignment theory (DAT) and research findings bearing on initial personnel classification from a number of simulation experiments, based on large samples of Soldiers with both operational and experimental test scores and MOS specific performance scores, is drawn upon in a critical review of recent HumRRO research (ARI Study Report 2005-1). The report being reviewed recommends using nine job families with corresponding best-weighted test composites that have been corrected for restriction in range to the recruit population and then converted to Army standard scores. This is the second tier of the two tiered classification system (TTCS) proposed by Zeidner and Johnson. The HumRRO authors primarily examine differential validity and validity coefficients with standard errors to reach the conclusion that there is no need for the first tier of the TTCS. A number of issues on which there is disagreement with the HumRRO authors are discussed.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA445466>

SN 2006-04

Update of U.S. Army Research Institute's Officer Personnel Research Databases (2003 — 2004). (2006). Young, W., Mackin, P.C., & O'Brien, K. (DTIC No. ADB318155 / Restricted).

SN 2006-05

Assessing the Value of Army Continuing Education System Programs and Services to the Army's Current and Future Force. (2006). Ramsberger, P.F., & Sticha, P.J. (DTIC No. ADA455104).

The Army Continuing Education System (ACES) received significant personnel cuts over Fiscal Years 2006 and 2007). Although previous studies demonstrated the positive effects of participation in ACES programs for both individual Soldiers and the Army as a whole, they did not address the direct relationship between ACES personnel and outcomes such as accelerated promotions and higher retention. This report summarizes analyses that investigated whether such a connection exists and the likely impact of reducing ACES personnel by nearly half. In addition to examining prior research on the impact of ACES, a database was developed containing a wide range of information such as programs offered and participation rates by installation. Analyses resulted in several noteworthy results, including: (a) online programs offered through eArmyU increase overall ACES participation; (b) the personnel cuts will result in a Soldier-counselor ratio of nearly 2000:1, almost double the ratio that existed in FY 2005 and far exceeding Army guidance in this regard; (c) the proposed cuts will lower participation rates and predictions indicate this will result in an increase in attrition, the cost of which will negate any savings realized through reduced numbers of ACES personnel.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA455104>

SN 2007-01**Modeling Army Applicants' Job Choices: The Enlisted Personnel Allocation System Simulation Job Choice Model.** (2006). Diaz, T.E., Ingerick, M., & Sticha, P.J. (DTIC No. ADA458765).

To ensure that the EPAS Field Test Simulation provides a realistic and unbiased evaluation of the optimization potential of EPAS, a model simulating Army applicants' job choice decisions is needed. This report summarizes development and evaluation of an empirically-grounded Job Choice Model (JCM), which relates applicants' aptitude scores, demographic characteristics, and job opportunity attributes (including monetary incentives) to their actual choices. As with real-world applicant decisions, it will be possible under the JCM for a given applicant to decide not to join the Army (not access). Similarly, if the applicant elects to join the Army (access), the JCM can simulate the applicant's choice of one of the many MOS reception-station date (job) opportunities from their job list. By sequentially modeling actual applicants' choice behavior, the JCM provides a realistic approximation of applicants' decision-making processes for simulation purposes. Evaluation of the JCM demonstrates that the model effectively simulates applicants' job choice decisions.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA458765>

SN 2007-02**Army SRB Program: Revised Estimates of Effects on Retention and Length of Reenlistment.**

(2006). Tsui, F., Hogan, P.F., Chandler, J., Espinosa, J., Mackin, P.C., & Greenston, P.M. (DTIC No. ADA460060).

In this study the effects of Selective Reenlistment Bonuses (SRBs) on Army reenlistments over the 1990-2000 period at Zones A, B, and C at three levels of occupational aggregation – all Army, career management field (CMF), and military occupational specialty (MOS) – were re-estimated to explicitly control for the drawdown in the mid-1990s as well as labor market conditions. In general, the results for Zone A at all levels of occupational aggregation indicate that reenlistment bonuses have a positive and statistically significant effect on Zone A reenlistments. A one-level increase in SRB at Zone A typically increases the reenlistment rate by 3 to 7 percentage points, depending upon the occupation. The results for Zone B are also solid at both the CMF and MOS levels. Results for Zone C, where reenlistment rates are typically very high, were reasonably solid but not quite as good as the Zone A and B results. The results provide the Army with estimates of reenlistment responsiveness to bonus changes for all three zones for all MOS. We also estimated the effect of SRBs on the reenlisting Soldier's choice of length of reenlistment. Increases in the SRB level not only increase reenlistments, but also increase the length of reenlistment. The length of reenlistment effects were incorporated into the SRB Management System to better predict program costs and the additional staff years of contracted service provided by the bonus program.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA460060>

SN 2007-03**Econometric Estimates of Army Retention: Zones A, B, C, D and Retirement Eligible (1990 – 2004).**

(2007). Moore, C., Hogan, P.F., Kirchner, C., Mackin, P.C., & Greenston, P.M. (DTIC No. ADA464636).

Efficient allocation of reenlistment bonuses requires the ability to estimate the effect that the bonus will have on reenlistments in an occupational specialty. Previous research, conducted in developing the SRB Management System, estimated the effects of SRB on Zone A, B and C reenlistment decisions made between FY1990 and FY2000. In this analysis, we extend the years analyzed to include FY2001 through FY2004. The additional years of data include Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). We tested the ability of the existing model to predict reenlistment decision-making post-FY2000. To improve fit, we generated new econometric estimates by MOS, CMF and Zone using the more recent years of data, and conducted out-of-sample prediction testing to confirm the validity of the updated model.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA464636>

SN 2007-04**Updating ARI Educational Benefits Usage Databases for Army Regular, Reserve, and Guard (2005 – 2006).** (2007). Young, W.Y. (DTIC No. ADA478062).

This report describes the updating of ARI's educational benefits usage database with Montgomery GI Bill and Army College Fund data for Army Regular, Reserve, and Guard components over the 2005 and 2006 period. For the Regular component, the report includes tabulations of program participation and benefit usage, type of educational program entered, and time between separation and start of education

benefits. For Reserve and Guard components, the report includes tabulations by benefit eligibility status, VA training time type, and type of educational program entered. The tabulations are presented by entry cohort, going back to the 1985 entry cohort for all three components.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA478062>

SN 2009-01

Updating ARI Educational Benefits Usage Databases for Army Regular, Reserve, and Guard (2006 – 2007). (2009). Young, W.Y. (DTIC No. ADB347265 / Restricted).

SN 2009-02

Summary of Findings and Recommendations from the Warrior Task Skills Retention Assessment. (2009). Cobb, M.G., James, D.R., Graves, T.R., & Wampler, R.L. (DTIC No. ADB353612 / Restricted).

SN 2009-03

Identifying Incentives to Increase the Retention of Army Medical Department Clinicians: Supplemental Appendices. (2009). Duehr, E.E., Cochran, C.C., Schneider, R.J., Muros, J.P., & Johnson, J.W. (DTIC No. ADB353704 / Restricted).

SN 2009-04

Updating ARI Educational Benefits Usage Databases for Army Regular, Reserve, and Guard (2007 – 2009). (2009). Young, W.Y. (DTIC No. ADB353733 / Restricted).

SN 2009-05

The Relationship between Enlisted Deployment and Retention. (2009). Hogan, P.F., Bouchery, E., Mackin, P.C., & Blayne, J. (2009). (DTIC No. ADB353808).

This Study Note reports the results of analysis investigating the relationship between Soldier combat zone deployment history and retention, based on data from FY 2003 through FY 2005. Using administrative data on actual re-enlistment decisions and combat zone deployments, we found that measures of a Soldier's most recent deployment history were positively associated with the probability of re-enlisting for both first and second term Soldiers. In contrast, when the expectation of deployment in the next term was considered instead of recent deployment history, we found that deployment has a negative impact on retention. When a measure of the hazard of deployment, fatality rates among Army Soldiers, was added to the model, a large negative impact on reenlistment was observed. However, the time period indicators still remained large and significant suggesting other unidentified factors impact reenlistment. In sum, the measures of deployment history used in this study did not fully explain the substantial declines in retention observed between FY 2003 and FY 2005. In particular, measures of expectations of future deployments were lower in FY 2005 than in FY 2004, but retention continued to decline between FY 2004 and FY 2005.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADB353808>

SN 2010-01

Usability of Wearable and Desktop Game Based Simulations: A Heuristic Evaluation. (2010). Barnett, J.S., & Taylor, G.S. (DTIC No. ADA520887).

The use of simulators based on game software has the potential to deliver effective training. However, simulators with usability problems can interfere with training by presenting unwanted distractions. This report describes an assessment of the usability of a wearable computer system which has been designed to interface with a virtual environment and which can be used for simulator training. Usability of the wearable system was compared with that of a more common desktop interface in a game-based virtual environment. Eight evaluators conducted a heuristic usability evaluation of the wearable system and desktop interfaces. They identified 24 usability concerns with the wearable system and desktop interfaces, and the virtual environment. The majority of the concerns (46%) were with the virtual environment. Forty-two percent of the concerns were related to the wearable system, and the remaining 12% dealt with the desktop interface. However, when the frequency, impact, and persistence scores were aggregated into an overall score, the wearable system had the poorest usability. Eight of the ten greatest usability concerns were related to the wearable system. These data suggest that the virtual environment is more usable with the desktop interface than the wearable system.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA520887>

SN 2011-01

Updating ARI Educational Benefits Usage Database for Army Regular, Reserve, and Guard: (2009-2010). (2011). Young, W.Y. (DTIC No. ADA544027).

This report describes the updating of ARI's educational benefits usage database with Montgomery GI Bill and Army College Fund data for Army Regular, Reserve, and Guard components over the 2009 and 2010 period. For the Regular component, the report includes tabulations of program participation and benefit usage, type of educational program entered, and time between separation and start of education benefits. For Reserve and Guard components, the report includes tabulations by benefit eligibility status, VA training time type, and type of educational program entered. The tabulations are presented by entry cohort, going back to the 1985 entry cohort for all three components.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA544027>

SN 2011-02

Development and Validation of Measures for Selecting Soldiers for the Officer Candidate School. (2011). Russell, T.L., & Tremble, T.R. (DTIC No. ADA548454).

The objectives of this project were to (a) develop and validate a predictor battery to identify OCS applicants with the most leadership potential, the best fit with the Army, and the greatest likelihood of staying in the Army and (b) investigate the outcomes of the two different avenues to OCS, namely the enlistment-option program (i.e., recruitment of civilians with a college degree) and the in-service program (i.e., the selection of enlisted Soldiers). The predictor battery (i.e., Officer Background and Experience Form, or OBEF) included measures of temperament, affectivity, values, and leadership judgment. The OBEF was validated against several criterion measures — OCS class performance data, attitudinal data, and career intentions gathered at the beginning and end of each class. Results were remarkably similar for the enlistment-option and in-service candidates. The OBEF scales added significantly to the prediction of affective commitment, career intentions, and OCS scores for leadership, fitness, and the total score. Future research should cross-validate these results and develop guidelines for using the OBEF for OCS selection, including how and when it would be administered and what the cut scores should be.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA548454>

SN 2014-01

Identification and Accessioning of Individuals for Officer Candidate School: Developing Realistic Job Previews. (2014). Oliver, J., Erk, R.T., Koch, A., Russell, T.L., Babin, N.E., Ardison, S.D., & Young, M.C. (DTIC No. ADA605546).

The U.S. Army Research Institute for the Behavioral and Social Sciences has been conducting research on the Identification and Accessioning of Individuals for Officer Candidate School, or AccessOCS, to (a) identify and describe OCS applicants in terms of motivations, backgrounds, and incentives; (b) consolidate information on the OCS selection and application process, and (c) develop recommendations for improving the OCS accessions process. Phase I of the project aimed to identify application and accessioning issues related to the OCS selection process (Oliver, Ardison, Russell, & Babin, 2010). The purpose of AccessOCS Phase II was to develop and evaluate a tool, a realistic job preview (RJP), designed to address some of the issues candidates and stakeholders reported in the accessioning process. Separate RJP's were developed for in-service and enlistment-option candidates. OCS candidates (n = 142) completed a survey to evaluate the RJP's. The final RJP's provide a tool for recruiting OCS candidates. Evaluations of the RJP's were generally positive, with 89% of candidates indicating that the RJP would have been useful to them before they applied to OCS, and 86% of candidates saying they would refer someone else to the RJP.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA605546>

Contractor Reports

CR 2004-01

Development of Officer Leadership for the Army: Preliminary Results. (2003). Avolio, B.J., & Yammarino, F.J. (DTIC No. ADA418016).

Two field experiments were designed to test some of the main propositions in transformational leadership theory. The main purpose for conducting these experiments was to develop a better understanding of how to accelerate the development of Army Officer Leadership. It was done systematically to create specific leadership constructs that examined how they affected individual/group development, readiness, and performance over time. The results show a successful pilot project where officers in the experimental and control condition differed in learning ideas about leadership, while remaining similar in other ways from those not receiving transformational leadership training.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA418016>

CR 2004-02

Working Memory Influences on Long Term Memory and Comprehension. (2004). Radvansky, G.A. (DTIC No. ADA419467).

This project was conducted with the aim of understanding the role of working memory in the comprehension and long-term retention of event-specific information. This study looked at how comprehension and memory processing at the mental model level is related to traditional measures of working memory capacity, including the word span, reading span, operation span, and spatial span tests. Issues of particular interest were the ability to remember event descriptions, the detection and memory of functional relations, the detection of inconsistencies, sensitivity to causal connectivity, and memory for surface form, text-based and situation-specific content. Although traditional working memory span measures were related to a few of our tests, the relation was primarily confined to the text-based level of processing. There was little evidence that traditional measures of working memory span were directly related to processing at the mental model level.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419467>

CR 2004-03

Perspectives on Studying Collaboration in Distributed Networks. (2004). Ross, K.G. (2004). (DTIC ADA419565).

This report describes cognitive variables and frameworks that are useful in the investigation of network collaboration in Army environments. Network collaboration is currently under study by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) in the context of performance in a simulated network task using the game SCUDHunt. SCUDHunt was developed by ThoughtLink, Incorporated for the Defense Advanced Research Projects Agency (DARPA). The use of SCUDHunt does not constitute endorsement of the product by ARI, the U.S. Army or the U.S. Department of Defense. Key variables that facilitate functioning in this simulated network environment are discussed, based on the results of interviews with proficient SCUDHunt players. Frameworks for examining the data from the SCUDHunt studies are presented. Finally, brief recommendations for the directions of future research in this domain are presented.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA419565>

CR 2004-04

Situational Awareness, Simulation Training and Assessment Toolset. (2004). Heinrich, M.L., Gately, M.T., & Lampton, D.R. (DTIC No. ADB297711 / Restricted).

CR 2004-05

Dismounted Infantry Situational Awareness Tool. (2004). Langevin, T., & Stammers, P. (DTIC No. ADB297705 / Restricted).

CR 2004-06

Automated Communications Analysis System for use in Military Synthetic Environment Exercises. (2004). Linegang, M.P., Freeman, J.T., Mizrahi, G., Entin, E.E., Baker, K., Lewis, D.D., Waite, M., & Leighton, K. (DTIC No. ADB298003 / Restricted).

CR 2004-07

New Measures of Situation Awareness for VE Based Training of Small Infantry Squads. (2004). Riley, J.M., Kaber, D.B., & Endsley, M.R. (DTIC No. ADB297990 / Restricted).

CR 2004-08

Enlistment Propensities of University Students. (2004). Moskos, C. (DTIC No. ADA426874).

The core thesis is that American military officers can play a key role in countering incipient and overt perceptions of American arrogance. This report is based on interviews with international officers (IOs) at American war, command and staff colleges in each of the services who participate in International Military and Education and Training (IMET). Overall, the level of multinational cooperation is remarkable. At the IMET level, recommendations include: (1) make medical insurance available for family members of all foreign officers; (2) decrease the classified material unavailable to IOs because of security classifications; (3) add more curriculum content on multinational operations; (4) be alert to the unique status of Arab IOs; and (5) make more effort to incorporate the spouses of IOs into the American social scene. Regarding multinational headquarters, recommendations include: (1) some use of non-English phrases in social interaction with IOs; (2) avoid speaking too quickly or using acronyms that are not familiar; (3) be alert to the stereotype of Americans as having a "zero-defects" or "check-point" mentality and an obsession with work; (4) encourage more cross-national informal activities; (5) read something about the home country of a fellow IO; and (6) rethink the career paths of Foreign Area Officers.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA426874>

CR 2005-01

Best Practices in Sexual Harassment Policy and Assessment. Alexander, P.C., Alexander, E.R., & Warner, S. (DTIC No. ADA430154).

A recent study reviewed how private-sector corporations deal with human relations, specifically with sexual harassment. The study conducted a telephone interview in late 1999 with a sample of Fortune 500 Corporations asking them about their sexual harassment policies, the strategies they used to communicate these policies, the training they used for their employees, and how they evaluated whether their policies were effective. Based on the study findings, organizations with the best programs for prevention of sexual harassment had effective human relations strategies in which policies and training on sexual harassment were embedded into the broader training programs aimed at work productivity, building effective teams, and establishing a positive working environment.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA430154>

CR 2005-02

Fielded Agent Based Geo-Analysis Network. (2005). Burleson, H.L., Woodley, R.S., & Agarwal, S. (DTIC No. ADA434524).

Traditional military command & control (C2) usually evokes images of operators in command centers. We consider mounted or dismounted Soldier going from points A to B in interconnected, information rich battlefield. This is C2 on a different scale. While the digital battlefield provides a tremendous amount of information to gain a tactical advantage, there are challenges to meet. The challenge is to sift through this information and identify critical information to help plan or re-plan the mission. The team of 21st Century Systems, Inc. and University of Missouri - Rolla is developing an agent-based decision-aiding system and technologies to train and assist the Soldier through that challenge. Our research examines planning and interactive terrain analysis incorporating spatial and temporal terrain details and dynamically changing intelligence information through battlefield networks. When given the mission intent, the system will be able to provide dynamic guidance for interactive terrain analysis and mission planning. Our system will be for the Soldier of the future trained in virtual, scenario-based simulation environments. Rather than developing specialized training environments, the emphasis of our system is embedded training of the Soldier so that the training interface is created around the Soldier's actual combat vehicle and systems.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA434524>

CR 2005-03

Intelligent Terrain Analysis and Tactical Support System for Unmanned Ground Vehicles. (2005). Jones, R.M., Arkin, R., & Sidki, N. (DTIC No. ADA434526).

The objective of this work is to design a dynamic intelligent terrain analysis and tactical support system (ITATSS). The system will enable unmanned combat and support vehicles to achieve significant new levels of autonomy, mobility, rapid response, coordination and effectiveness, while simultaneously enriching human-robot interaction, expanding tactical capabilities, and reducing human workload. ITATSS integrates work in intelligent agent architectures for decision support, low-level feature processing, for analyzing terrain and situational features, and robot sensor motor interfaces. There are currently mature existing tools that handle these capabilities separately, but ITATSS will integrate them into a single architecture. One advantage of such an integrated architecture is that it will help make all of the digital aids familiar and useful to human operators. This report provides a document to guide the design, development, and evaluation of ITATSS. This should serve as a solid design document for any future efforts to build applications in this area. As part of the design, we have identified a large number of requirements on system components, and any system designed for this application area should meet these requirements.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA434526>

CR 2005-04

Terrain Analysis for Human Robot Interaction: Enabling Terrain Understanding to Improve Tactical Behavior. (2005). Hicinbothom, J., Murphy, R., Riddle, D., & Graves, K. (DTIC No. ADA434525).

Terrain has a big impact on how battlefield situations unfold primarily because of its effects on observability, mobility, and restriction of fields of fire. As armed forces of the information age come within each other's sensor coverage, information about them is rapidly conveyed to their opponents. Terrain imposes constraints and opens opportunities for the creative use of Battlefield Operating Systems (BOS) and the capabilities and limitations of available troops, vehicles, systems, and materiel. Thus, understanding terrain and its tactical import is essential for a force to succeed in its missions. Future Force Warrior (FFW) and Future Combat Systems (FCS) initiatives are developing advanced functional capabilities to aid Soldiers in operations to control and hold ground. Adding robotic vehicles, sensors, and weapons creates a planning and coordination challenge for commanders, and highlights the need for autonomous robotic systems that effectively "understand" the tactical import of terrain and integrate that understanding into their situation awareness and behavior-generation processes. TAH-RI is reusable component software providing means of increasing readiness of Soldiers (e.g., in training and performance support systems) to integrate terrain understanding into battlefield decision-making processes, and means of enabling more autonomy in robots through terrain understanding for tactical behavior generation.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA434525>

CR 2005-05

Applying Technology to Train Visualization Skills. (2005). Nanda, S. (DTIC No. ADA435030).

Training visualization skills, such as terrain appreciation, is generally difficult and inefficient in the real world with natural representations or in a classroom with analog representations. Field training requires physical relocation of trainees to multiple sites and is constrained by the terrain types and features at the physical sites available. Classroom training is traditionally based on analog methods with inflexible formats (e.g., graphics and pictures) that afford little control over viewing perspective, environmental conditions, or comparison with map representations. In contrast, the application of digital methods to train and enhance visualization skills may overcome many of these training limitations. This Phase I effort addressed three objectives: identify a set of key visualization skills required by war fighters, develop core technologies for training those visualization skills, and develop digital training methods based on the core technologies. In particular, the training approach dynamically varies digital terrain representations to match real world perspectives and attempts to foster cognitive engagement by providing trainees direct control over the matching process (e.g., morphing between 2-dimensional and 3-dimensional terrain perspectives).

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA435030>

CR 2005-06

Meta-Information Visualization to Enhance the Common Operational Picture: Final Report. (2005). Pfautz, J., Bisantz, A., Fouse, A., Roth, E., Fichtl, T., & Zacharias, G. (DTIC No. ADB311185 / Restricted).

CR 2005-07

Multi-tasking Assessment for Personnel Selection and Development. (2005). Fischer, S.C., & Mautone, P.D. (DTIC No. ADA437535).

Multi-tasking (MT) is prevalent in many work environments. While there are often negative consequences of MT, such as increased error, stress, and turnover, some individuals thrive in MT environments. An assessment tool that predicts performance in different MT environments would be invaluable for personnel selection and assignment. A central purpose of the present research was to investigate variations that exist among MT environments in order to form a better understanding of the demands placed on workers in these different environments. From a review of MT-related literature, and interviews with experts from different Military Occupational Specialties (MOS), we distilled individual differences and environmental variables that affect performance in different MT environments. Based on this research, we created a model of MT environments that varies along three main dimensions: type of MT required (decision-making, information-monitoring, and task-flow management), intensity of MT, and consequences of failure. The model was then used to guide the development of a measurement approach which assesses both MT environments and individuals' ability to perform well in those environments. The purpose, scope, and framework of this comprehensive Multi-Tasking Assessment System are described in the report, as well as a description of additional research necessary for the development of the system.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA437535>

CR 2005-08

Adaptive Instructional Systems. (2005). Skipper, D.J., Delugach, H., & Evans, D. (DTIC No. ADA380430).

Adaptive Instructional Systems are those systems which guide the student's instruction based on the student's performance and current abilities. This report describes an Adaptive Instructional System designed on using Conceptual Graphs to maintain an internal concept of both the student and the instructor. The graphs are shown as being capable of monitoring and guiding the instruction adaptively.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA380430>

CR 2005-09

An Intelligent Tutoring System Approach to Adaptive Instructional Systems. (2005). Ong, J.C., & Ramachandran, S. (DTIC No. ADA437533).

Report developed under a Small Business Innovation Research Program 99.2 contract for topic OSD-99-04. Training programs provide students with deliberately selected learning experiences, so they can acquire and retain knowledge and skills. Intelligent Tutoring Systems (ITs) are computer-based training systems that mimic human instructors to provide automated, one-on-one instruction. Most ITs developed so far have applied a limited set of strategies for adapting instruction to differences among individual students. During this Phase I SBIR project, we developed a generic model of adaptive instructional systems that is designed to be broadly applicable across a wide range of training domains. We then applied this generic model as a framework for describing how AIS capabilities could be added to the Intelligent Flight Trainer (IFT), a helicopter training simulator deployed at Ft. Rucker, Alabama. Finally, we developed a limited, proof-of-concept software prototype to illustrate elements of this model. The generic AIS model appears plausible, feasible, and useful, and the software prototype provides additional encouragement.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA437533>

CR 2005-10

Skill Training Using Adaptive Technology: A Better Way to Hover. (2005). Sharkey, T.J., Ciavarelli, A.P., & Asbury, C.N. (DTIC No. ADA437527).

This report describes the work performed by Monterey Technologies, Inc. under a Phase 1 Small Business Innovation Research (SBIR) contract. The goal of the work was to determine the feasibility of developing and implementing an automated, adaptive hover training controller based on human performance models and novel feedback techniques for Student Pilots (SP) in Initial Entry Rotary Wing (IERW) training. A review of the relevant literature was performed. Based on this review, an approach where a training prescription is made for each student state and skill level is recommended. This review has implications for the state of adaptive prescriptions for training psychomotor tasks relative to training of cognitive skills. The recommended training system includes descriptions and functions for several elements of the training system and the recommended software models. These models are to be

developed using commercially available software designed to support a particular type of AI approach most suitable for this application. Software packages are reviewed and a suite of products appropriate for use in this application is recommended.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA437527>

CR 2005-11

Adaptive Instructional Systems. (2005). Cobb, P. (DTIC No. ADA438093).

This report was developed under SBIR contract for Topic OSD99-004. This report describes the Phase I activities conducted for the Army Research Institute (ARI) at Cybernet Systems Corporation during the period of 24th, 2000 to 24th, 2000, under the "Adaptive Instructional Systems" contract DASW01-00-M-4088. These activities focused on four major areas:

1. Develop a Helicopter Flight Model for the Model-Based Reasoning Diagnostic Engine (MBRDE),
2. Integrate the Model-Based Reasoning Diagnostic Engine into the OpenSkies Virtual Environment Training System,
3. Enhance the OpenSkies Virtual Environment Training System to Focus the Student's Effort in Deficient Areas, and
4. Demonstrate Adaptive Training by Creating a Scenario for Hovering a Helicopter in OpenSkies

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA438093>

CR 2006-01

Assessment of Unit Focused Stability in the 172nd Stryker Brigade Combat Team. (2005). Smith, M.D. (DTIC No. ADB313116 / Restricted).

CR 2006-02

MAVEN-SA: Model Based Automated Visualization for Enhanced Situation Awareness.

(2005). Wood, S.D., Zientz, J., Holt, L.S., St. Amant, R., Healey, C., Endsley, M., & Strater, L.D. (DTIC No. ADA442461).

Report developed under a Phase I Small Business Technology Transfer Research (STTR) program contract for topic A04-T002. The research reported here explored methods for training battlefield visualization through human-computer visualization. The objective was to determine whether an adaptive visualization system that strongly leverages current findings in cognitive and perceptual psychology and in situation awareness could be designed that would improve Army schoolhouse training. The research approach had three focal points. First, we reviewed the extant literature on perceptual and cognitive visualization and mixed-initiative interaction as related to military situation awareness and decision-making. Second, we developed a company level Military Operations in Urban Terrain (MOUT) scenario to inform our inquiry. Third, we developed a limited capability visualization prototype to test core approach concepts. The work conducted during Phase I lays the foundation for a Phase II plan to develop a usable schoolhouse tool for training battlespace visualization and to test the utility of this tool in an experimental setting.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA442461>

CR 2006-03

Proceedings from the ETS and Army Research Institute Emotional Intelligence Workshop.

(2006). Roberts, R.D., Minsky, J., Gade, P.A., Kyllonen, P.C., Zeidner, M., Matthews, G., & Strickland, W.J. (DTIC No. ADM001936 / CD-ROM).

The purpose of the Emotional Intelligence: Knowns & Unknowns workshop was to bring together top researchers from around the world who specialize in emotion, individual differences in related constructs (e.g., personality, intelligence) and assessment to address empirical, conceptual, and practical limitations impeding scientific progress towards understanding emotional intelligence. The workshop was organized around five themes: Emotions: Multi-Disciplinary Perspectives; Emotions: Psychological Perspectives; Related Constructs; Assessment; and Applications. The workshop also included a keynote address by Paul Ekman on the topic of emotional skills.

CR 2006-04

Electronic Performance Support for Future Trainers: A Conceptual Framework. (2006). Leibrecht, B.C., Wilson, B.E., & Kiser, R.D. (DTIC No. ADB316147 / Restricted).

CR 2006-05

Battle Captain Advanced Team Training Development and Assessment. (2006). Kambe, G., Kline, K.F., Price, D.M., & Grubb, G.N. (DTIC No. ADB321985 / Restricted).

CR 2006-06

Scenario Based Leadership Training for Unit Task Force Staff Officers. (2006). Ong, J.C. (DTIC No. ADB321243 / Restricted).

CR 2007-01

Training Cognitive Leadership Skills in a Joint Task Force Context: A Computer Simulation of Operational Strategic Warfare. (2006). Miranda, J., & Zalewski, T. (DTIC No. ADB321244 / Restricted).

CR 2007-02

Improving and Broadening SHIELD Utility. (2006). Christensen, A.N., Rine, P.A., & Arntz, S.J. (DTIC No. ADB321972 / Restricted).

CR 2007-03

Adaptive Role-Play Exercises for a Leader Development Center. (2006). Hertz, M. (DTIC No. ADA460360).

This report describes work performed under a Phase I Small Business Innovation Research Contract. This report describes two research and development activities. One effort was the creation of a plan for the development of a Leader Development Center. Progeny Systems proposed to create a simulation or scenario-driven computer-based assessment of an individual's leadership performance. In order to create this computer-based assessment solution, the relevant literature had to be reviewed to develop the theoretical framework for the proof of concept solution. The other significant effort was the creation of a system to deliver content, capture user responses, and report results out to an external system. This Simulation Delivery System was created using XML, web services and the .Net 2.0 framework to minimize the client-side code and keep as much processing and functionality on the web server as possible. Moving the functionality out of the Simulation Environment also granted flexibility in which Simulation Engine could be used. These web services were further split into three different, but complementary functions, Get Leadership Data, Get Simulation Parameters, and Store Leadership Simulation Results.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA460360>

CR 2007-04

Training a Joint and Expeditionary Mindset. (2006). Menaker, E.S., MacDonald, J., Hendrick, A., & O'Conner, D. (DTIC No. ADA460138).

The purpose of this research was to design a computer-mediated training environment to help ground-component forces develop the cognitive and affective skills needed to meet the challenges of engaging as a Joint and Expeditionary force. These skills are critical for effective performance of Combat Arms, Combat Support, Combat Service Support, and Reserve and National Guard components in the new operational environment. Qualitative analysis methods, including an extensive literature review, document review, and interviews with experienced joint forces troops were used to identify the constructs required for developing a Joint and Expeditionary Mindset (JEM). The investigation resulted in a multiphase process for identifying the required JEM skills and performance indicators associated with the JEM constructs and for using them to create effective computer-mediated training scenarios. The pedagogic model enables development of scenarios that challenge Soldiers in cognitive, affective, metacognitive, and moral dimensions. The scenario design blueprint specifies the skills, indicators, and measures to be scripted in the scenarios. Two proof-of-concept scenarios were developed based on this model and blueprint methodology. The resulting scenarios were demonstrated for an academic military audience. Results indicated the viability of this approach.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA460138>

CR 2007-05

An Analysis of a Joint and Expeditionary Mindset. (2006). Walsh, W.J. & Shingledecker, C.A. (DTIC No. ADA460068).

This report was developed under the Small Business Innovative Research Program, Phase I. The goal of the research was to identify cognitive readiness skills necessary for ground component forces to deploy anywhere in the world on short notice, and the meta-cognitive awareness necessary to be adaptable and

learn quickly in an unknown culture. The authors found that Joint refers to a major shift toward blending the doctrine, language, and cultures of the Service branches to enable effective interoperability. Expeditionary means being rapidly deployable, self-sustainable, with the ability to reconstitute rapidly in theatre and assume further mission taskings. Soldiers must have the capability of being effective while operating in a zone of discomfort and making decisions in ambiguous environments. Working with the Center for Army Leadership, the authors narrowed the focus to providing Army Transition Teams with the wherewithal to more efficiently perform their difficult task advising fledgling security forces to achieve self-sustainability. Seven critical issues were identified contributing to the concepts discussed: culture shock, stress, role shock, dealing with foreign nationals, negotiating skills, Service component differences, and cross-culture communication skills.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA460068>

CR 2007-06

Computer Mediated Training Tools to Enhance Joint Task Force Cognitive Leadership Skills. (2007). Linkov, I., Fenton, G., Satterstrom, F.K., Gaskins, R., & Lewis, B. (DTIC No. ADA465397).

This project describes a computer-mediated cognitive leadership training program for helping leaders of a Joint Task Force overcome cultural barriers between services. The program focuses on the brigade level (and higher) echelons of service warfighting units, and it is intended as a supplement to intermediate-level formal service schools. The training environment features a user-friendly interface based on the Decisive Action platform, which provides a controlled environment for leadership skill training. The proposed scenario places the participant in a crisis situation as the commanding officer of a Joint Force operation. A crisis situation requires information from a wide range of information sources and categories, and the trainee, as the commander, must assess the situation with the information provided. The trainees are assessed on how well they adapt to unforeseen circumstances that are introduced during the course of the experiment.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA465397>

CR 2007-07

Virtual Observer Controller for Small Unit Infantry Leader Simulation Training. (2007). Banta, H.G., Troillet, D.B., Daly, J.P., & Martin, G.A. (DTIC No. ADA469326).

This report was developed under a Small Business Technology Transfer Research (STTR) Phase II contract. It describes the development of a prototype Virtual Observer/Controller (VOC) to observe the performance of and offer limited feedback to small-unit, dismounted Infantry Soldiers while training with the Soldier Visualization System (SVS). The successful integration of technologies paved the way for SVS exercises that were not completely dependent on a human observer/controller. The development and implementation of the prototype VOC required several major efforts: (a) identifying the Soldier behaviors that merit performance evaluations, (b) developing situation triggers in the context of a training scenario that stimulate the Soldier behaviors that will be observed and evaluated, (c) determining how to detect those behaviors in an automated fashion, and (d) developing instructional strategies that can adequately respond to both individual actions and small-unit collective behaviors.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA469326>

CR 2007-08

Training a Joint and Expeditionary Mindset. (2007). Riccio, G.E., Lerario, M.P., d'Echert, B.C., Pound, D.S., Brunyé, T.T., & Diedrich, F.J. (DTIC No. ADB327792 / Restricted).

CR 2007-09

Enhancing Joint Task Force Cognitive Leadership Skills. (2007). Riccio, G.E., d'Echert, B.C., Lerario, M.P., Pound, D.S., Brunyé, T.T., & Diedrich, F.J. (DTIC No. ADB327845 / Restricted).

CR 2007-10

The Leadership Formula: Potential X Motivation X Development. (2007). Popper, M., Amit, K., Gal, R., Mishkal-Sinai, M., & Lisak, A. (DTIC No. ADA472601).

Three factors, potential (P), motivation (M), and development (D) constitute the frame of reference proposed in this research for leadership development: $P \times M \times D$. The three factors are presented here in an interactive (multiplicative), rather than an additive relationship because of our prior assumption that if one of the factors is absent (or has zero value), the product of the multiplication will be zero, namely no leadership. This assumption has yet to be examined empirically, although it has been raised in the past on the basis of common sense. On the other hand, it may be argued that while one or two of

the components (almost certainly potential and motivation) are essential for leadership, the third (development) is possible and additive, but not essential. This is the aim of the present research: to examine the nature of the relationship between the three components. At the same time, the research assumption is that all three components are required in the leadership process and that the absence of one of them will invalidate the equation, in other words, will not produce effective leadership.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA472601>

CR 2008-01

Feasibility of Developing a Common U.S. Army Helicopter Pilot Candidate Selection System: Analysis of U.S. Air Force Data. (2007). Damos, D.L., & Gould, R.B. (DTIC No. ADA475416).

The U.S. Army's aviator candidate pool, unlike the pools for the U.S. Air Force (USAF) and U.S. Navy (USN), includes military enlisted personnel and civilians, many of whom do not have a 4-year college degree. Existing tests, such as the Air Force Officer Qualifying Test (AFOQT), may be too difficult for a substantial subset of Army aviator candidates, failing to produce a sufficient spread of scores at selection points. The analyses evaluated the difficulty of the AFOQT for a sample of USAF personnel that should be similar in education to the U.S. Army aviator applicant populations. The analyses compared score distributions of the AFOQT subtest and composite scores for different sample sources. The AFOQT was more difficult for the Air Force enlisted personnel than for other commissioning source applicants. However, the subtest and composite score distributions are sufficient to discriminate well between enlisted personnel if the AFOQT or a similar aptitude test is used for selection. On the highly timed subtests of the Pilot Composite, such as the Instrument Comprehension and Table Reading tests, there is almost no difference between the examinee subpopulations.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA475416>

CR 2008-02

Measuring Learning and Performance in Collective Training Exercises. (2008). McGilvray, D.H., Leibrecht, B.C., & Lockaby, K.J. (DTIC No. ADA480052)

The goal of the research described in this report was to develop a proof-of-principle scoring system that can be used to evaluate training effectiveness across diverse scenarios. The focus was on supporting evaluators as they evaluate and track unit performance across scenarios. The report describes the products of the research as well as the insights and lessons learned. A scoring system with a computer interface suitable for a hand-held computer was developed and tried out with Infantry subject matter experts acting as evaluators observing virtual scenarios. The try-out provided empirical data on the utility of the scoring system and on desired improvements. Based on feedback from the try-out, the scoring system was revised. The report contains findings and lessons learned that can guide future efforts to automate evaluator and Observer/Controller (O/C) support tools.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA480052>

CR 2008-03

Tools for Creating Objects and Behaviors for Distributed Simulations with a Cultural Context. (2008). Sims, E.M. (DTIC No. ADB338317 / Restricted).

CR 2008-04

Tools for Creating Skill Training Content in Distributed Simulations. (2008). Valente, A., & Johnson, W.L. (DTIC No. ADB338319 / Restricted).

CR 2008-05

Tools and Technologies for Inserting Deep Cultural Context into Mission Training Simulations. (2008). Davis, A., & Fu, D. (DTIC No. ADB338320 / Restricted).

CR 2008-06

Cultural Behavior Generation. (2008). Reece, D.A., & Taylor, G. (DTIC No. ADA479977 / Restricted).

CR 2009-01

Survey Software Evaluation. (2009). Heinen, B.A., Meiman, E., Fien-Helfman, D.A., Ayine, S.K., & Khan, A.A. (DTIC No. ADA495855).

ICF International reviewed 74 COTS Web-based survey software products for potential use by ARI researchers in survey development and administration. Products were reviewed based on their ability to meet the following key criteria: 1) survey development and hosting could be on ARI servers; 2) company

size and reputation suggest the company would be able to provide quality service for many years; 3) the survey product meets Army and DoD security regulations and technical requirements, and 4) the survey features meet the feature needs of ARI researchers. Based on our review and analyses, we conclude that Conformat EFM Professional and Vovici EFM Community best meet ARI's research needs and technical requirements. Conformat EFM Professional, although expensive compared to the other products reviewed, has a high percentage of desired survey features available (81.58%) and is compatible with the IT and security requirements of ARI. Vovici EFM Community has a slightly lower percentage of survey features available (72.37%) than Conformat EFM Professional, but is a more cost-effective solution and has a Certificate of Networthiness for an earlier version of the current product.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA495855>

CR 2009-02

Talent Maturity Assessment for the United States Army Civilian Corps. (2009). (DTIC No. ADB350237 / Restricted).

CR 2009-03

Review of Online Data Collection and Data Storage Procedures. (2009). Heinen, B.A., Meiman, E., Fien-Helfman, D.A., Ayine, S.K., & Khan, A.A. (DTIC No. ADB353741 / Restricted).

CR 2009-04

Special Operations 360 Degree Feedback Programs: Data Analysis Plan and Results. (2009). Willison, S., & O'Shea, P.G. (DTIC No. ADB353610 / Restricted).

CR 2009-05

The Impact of Knowledge on Team Development. (2009). Handel, M., Jackson, P.R., & Murray, M. (DTIC No. ADA509881).

Successful teamwork requires development of trust (as well as appropriate distrust) among the team members, and understanding how trust develops in newly formed teams is essential for the development of new team-building methodologies. Research on trust formation in teams has primarily been conducted in either a lab or a classroom, which ignores factors important in the real world such as reputation/prior knowledge of teammates, knowledge of the role played on the team, and knowledge of processes and routines to support the team. We conducted research to understand the impact these factors play in team development in emergent, ad-hoc, geographically distributed teams. We found that organizational tenure had a slight negative effect in trust development, prior knowledge of team members had no effect, and an ambiguous relationship was found between processes and tool knowledge on team development. We concluded our research with some observations about project versus process teams.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA509881>

CR 2009-06

Linguistic Geometry Techniques for Distributed Interactive Training. (2009). Stilman, B., & Yakhnis, V. (DTIC No. ADB353811 / Restricted).

CR 2009-07

Automated Support for After Action Review Presentation. (2009). Ayers, J.M., & Caler, N. (DTIC No. ADA507982).

Although the Army developed the after action review (AAR) for live simulation, it is now applying the process to exercises conducted within virtual environments. Virtual AAR systems provide can significantly facilitate understanding of scenario performance; however, these systems require automated performance assessment capabilities to realize their full potential. We developed Automated Support for AAR Presentation (ASAP), a suite of intelligent technologies designed to enhance virtual AAR systems such as the Dismounted Infantry Virtual After Action Review System (DIVAARS). For this effort, Aptima leveraged its A-Measure product, which provides automated support for authoring, capturing, and synthesizing measures of human performance in simulated environments. The team worked closely with subject matter experts to design a system that enables search and synthesis of simulation-based performance data. Moreover, it organized analytical conclusions into various formats that integrated with AAR systems such as DIVAARS. The resulting toolkit enhanced the capabilities of AAR systems and provided intelligent event recognition and assessment support that extends a human observer's ability to document, understand, and describe scenario-based performance.
<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA507982>

CR 2010-01

Measuring Organizational Learning: A Preliminary Progress Report. (2010). Winkler, C., & Russell, C.T. (DTIC No. ADA527547).

The goal of this research effort was to develop observer-based measures of organization learning and then apply the measures to assess how a Stryker Brigade Combat Team (SBCT) cognitively prepares for combat. The research team adopted a measurement approach based on what is called the Tactical Problem Solving Process (TPSP), rather than the Military Decision Making Process (MDMP), as TPSP better reflects how brigades currently conduct the planning process during exercises. During Phase 1, a set of preliminary measures were developed to assess: Leader Initiative, Command Approach, and Understanding Command Intent. At the contractor's request, the Phase II assessment was not conducted. This report, therefore, documents the preliminary but potentially useful progress made on measuring organization learning.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA527547>

CR 2010-02

A Computer Mediated Learning Environment for a Joint and Expeditionary Mindset. (2010).

Riccio, G.E., Lerario, M.P., Semmens, R.P., Diedrich, F.J., Marc, Y., & Digby, G. (DTIC No. ADA527550).

The objective of the research was to develop a computer-mediated training environment to prepare ground component forces with the necessary cognitive skills for the emerging challenges of a Joint and expeditionary force. A key element of such a mindset is to be comfortable and proficient in interacting with people from different specialties for the purpose of collaborative problem solving at the boundaries between the known and the knowable. The product of this effort, Socrates Window, provides an open-source web-based solution that has the potential to facilitate interactions between students, instructors, and outside experts that blends classroom-based learning with distance learning. Evidence from stakeholders and end users, such as small group instructors in Army training and education, indicates that Socrates Window has both value and utility. It is not usable, however, in programs of instruction for which information technology and security constraints de-motivate use of social networking tools.

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA527550>

CR 2011-01

Joint Measurement Operations Controller. (2011). Feeney, J., Salter, W., Ayers, J.M., Puglisi, M., & Schaab, B.B. (DTIC No. ADA535422).

The increasingly complex interactions of systems of systems for training today's military means that supporting joint training exercises includes supporting live, virtual and constructive simulations. Capturing and integrating observer-based measures with other data sources is essential for supporting complete assessment of training exercises. The Joint After Action Review Repository Library (JAAR) is a suite of software tools, linked through a common architecture that leverages a number of efforts across Services and is made available to, and has been used by, various end-user training organizations. Joint Measurement Operations Control (JMOC) successfully integrated the SPOTLITE platform for the collection of observer-based measures into the JAAR. JMOC also provided measures to support both exercises and the JAAR program by using observer-based measures to capture performance on the installation and training for JAAR integrations and deployments..

<http://www.dtic.mil/get-tr-doc/pdf?AD=ADA535422>

CR 2011-02

Rapid Authoring of Demonstrations for eXperience. (2011).

Jensen, R., Fu, D., Ramachandran, S., Salas, E., Rosen, M.A., & Pavlas, D. (DTIC No. ADB368245 / Restricted).

CR 2012-01

Game Based Training Research Facility. (2012). Martin, G.A., & Daly, J.P. (DTIC No. ADB381616 / Restricted).

CR 2013-01

Rapid Simulation Development Processes and Tools for Job Performance Assessment. (2013).

Ramachandran, S., Shuffler, M., Kramer, W.S., Wiese, C.W., Rosen, M.A., Salas, E., & Dressel, J.D. (DTIC No. ADB389955 / Restricted).

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