

Technical Report 1290

**Current Practice and Theoretical Foundations
of the After Action Review**

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and Phillip N. Jones**
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**United States Army Research Institute
for the Behavioral and Social Sciences**

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CURRENT PRACTICE AND THEORETICAL FOUNDATIONS OF THE AFTER ACTION REVIEW

EXECUTIVE SUMMARY

Research Requirement:

The After Action Review (AAR) has been the foundation of U.S. Army training for decades. Although leaders and Soldiers agree on the importance of AARs for training, little is known about why, from a learning theory standpoint, AARs enhance training, or how AARs are currently practiced in the US Army. Therefore, ARI decided to sponsor research to (a) identify the theoretical foundations of the AAR from learning theory, (b) determine how AAR facilitators are trained, (c) establish how AARs are currently conducted in the US Army, and finally, (d) seek out ways AARs might be improved.

Procedure:

We investigated theoretical foundations, doctrinal guidance, and the perceptions of U.S. Army personnel regarding the importance of AAR to training effectiveness. The latter included what approaches work best, and how the AAR is practiced today. First, a literature review was conducted to identify what the learning research had to say about how AARs influence learning (see ARI Research Note 2011-X). The research team observed AARs being executed at the National Training Center (NTC) and within the Battle Command Training Program (BCTP) followed by interviews of their Observer Controllers (O/Cs). Additional observations of AAR practice at Fort Stewart, GA and Fort Polk, LA followed. An online survey deployed via U.S. Army Knowledge Online (AKO) resulted in 901 responses spread across all ranks from General Officer to specialist and all experience levels.

Findings:

The key findings from this research show that the AAR is a fundamental part of the U.S. Army training culture with recognized value at the trainer and trainee level. However, practice of the AAR varies across the U.S. Army, and among individual practitioners more so than between training programs or organizations. Survey respondents were nearly universally supportive of the AAR as a key contributor to training effectiveness, but also provided us additional insight based on their experiences as to what works best. Previous research by members of the research team had resulted in a proposed Integrated Theory of AAR (ITAAR) model. During this research we reevaluated the completeness of that model and identified enhancements to it. Military research regarding the AAR has been led by a few key individuals and organizations that primarily focused on technology-supported training environments and how to best support or conduct AARs therein. AAR guidance to U.S. Army personnel or doctrine is several decades old but not necessarily out of date as the principles are, for the most part, timeless.

Utilization and Dissemination of Findings:

The findings indicate a need for training on the conduct of AARs within officer and professional education programs. Such training should familiarize students with the underlying theoretical and learning principles which inform the process of AAR, provide them techniques and best practice for facilitating an AAR, and provide realistic opportunities to practice those techniques. Future research may be warranted to develop a standard curriculum for Army schools and centers. Such an effort would investigate differences among AAR system - capabilities, AAR processes, and best practices to support different training environments (e.g., Live, Virtual, Constructive, Gaming). Multidisciplinary training on how to execute an AAR, sponsored by TRADOC, is recommended. A need also exists for the development of specific learning materials to support operational unit training and as a reference for use by practitioners at all levels. Whether that supporting material is in the form of a text, guidebook, or set of interactive training aids remains to be determined.

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CURRENT PRACTICE AND THEORETICAL FOUNDATIONS OF THE AFTER ACTION REVIEW

Background

Cognitive and Learning Sciences Research Summary

Researchers have long acknowledged provision of feedback as essential for efficient learning (c.f., Mory, 1992). Yet, the methods available for administering feedback vary widely, as does the consistency with which they are used by trainers to accomplish feedback administration. Unfortunately, failures to provide effective feedback have led to poor knowledge retention, poor knowledge transfer, and a tendency among some to discount the importance of the feedback process. Some of these failures are caused by difficulties capturing meaningful data. More often, poor feedback stems from the non-intuitive design of feedback sessions and variability in feedback administration. Consequently, trainees who could benefit from proper feedback administration may adopt a cavalier or skeptical opinion of the importance of training feedback. The complexity of modern military missions and the necessity for seamless interaction of Soldier team members requires that feedback be consistent and effective, and that it be delivered to ensure maximal retention and task transfer (Baird, Holland, & Deacon, 1999). For a more thorough review of the literature in this area, see Bliss, Minnis, Wilkinson, Mastaglio, & Barnett (in preparation).

Description of After Action Reviews

An after action review (AAR) is a retrospective session that allows trainees to review prior training performance. AAR sessions are not intended to be critical evaluations of performance so much as collaborative meetings held to enhance learning. Ideally, AARs should be conducted to focus on what was planned to occur during training, what actually did occur during training, why events unfolded as they did, and what should be modified during subsequent training or performance sessions. It is important to emphasize that AARs are generally conducted at the team level. Though individual AARs are possible, they are typically introspective and personal. Optimally, AAR sessions should be held as soon after training as is practical.

How a typical AAR is conducted. An AAR is typically led by a facilitator, sometimes the unit leader, but for more formal AARs it can be an Observer/Controller (O/C) or other experienced trainer. The facilitator is ideally a training expert who is also familiar with the goals of the training session. Facilitators are typically non-commissioned officers or officers with considerable experience.

The facilitator typically starts the AAR by reviewing the mission and training objectives. The facilitator then encourages the training audience to discuss what happened at specific points during the exercise, including not only the actions of the unit, but how effective those actions were to meet mission objectives. The members of the unit are expected to reflect upon their performance, consider whether their performance met U.S. Army standards, and, if not, reflect on how they could improve their performance in the future. The facilitator chooses what points to discuss and provides “ground truth” when information is missing or misunderstandings occur, but individual unit members are expected to evaluate their own performance.

AARs in Practice

There is considerable variability with regard to how military AARs are conducted during unit training. This variability most often reflects the complexity of the training situation. Many training sessions (particularly at major facilities such as the National Training Center (NTC) at Fort Irwin, CA) may stretch for two weeks or more with Soldiers engaged in simulated combat against thinking, flexible, creative opponents. Over that period, there are several types of feedback sessions that trainers call AARs, ranging from informal “hotwashes” to more formal collaborative sessions. For this research, we claim that feedback sessions which use a specific approach that is based on facilitation of a review and feedback process primarily driven by the training audience are AARs. (See Appendix B for a full review of AARs in practice.)

An important variable that impacts AAR implementation is the nature of AAR facilitators (Keene, 1994). Each one may use a different philosophy about how best to approach the team, and may espouse a different interaction style. Different facilitators may be more or less effective at stimulating discussion, leading participants, structuring the lessons, reflecting on planned goals, and synthesizing the lessons learned from the AAR. Trainees themselves also constitute a source of variability. Some groups function cohesively with a clear leader. Other groups may contain unfamiliar members, may have a less effective leader, or may suffer from internal strife or conflict. These issues potentially cause AARs to be inconsistent and their outcomes can therefore be unpredictable.

Facilitators should have a clear understanding of the underlying principles of the AAR process. Failure to understand these principles, for example, the difference between an AAR and a critique, can rob the review of its effectiveness. Early attempts to transition the AAR concept to the corporate world had limited success, possibly because of a misunderstanding of AAR principles. Peter Senge (2001) remarks:

The Army's After Action Review (AAR) is arguably one of the most successful organizational learning methods yet devised. Yet, most every corporate effort to graft this truly innovative practice into their culture has failed because, again and again, people reduce the living practice of AAR's to a sterile technique.

This suggests that the AAR technique should be more than simply a static process that is transferable across organizations and contexts. Rather it should be tailored to the needs of a particular context and requires a trainer who understands the underlying principles of an AAR, and is adept at facilitating the group introspection and communication that allows a team to engage in self-learning and self-correction.

A second issue with current AAR practices is that they are frequently defined by practical constraints, rather than driven by key findings from behavioral researchers. AARs have been referred to as a self-contained substantiation of a broader knowledge management program. They are designed with the overriding purpose of enhancing knowledge. However, to realize the benefits possible from AARs, we need to review the publications of researchers who have studied the learning process. Scientists have published volumes devoted to curriculum design, practice, feedback and other theoretical concerns. Yet, too often the implementation of AARs caters to time constraints, leadership constraints, labor constraints, and monetary constraints. As a result, the theoretical value of the technique is distilled or eliminated altogether. To illustrate such this challenge, DeGrosky (2005) highlighted several problems faced by Wildland Fire

Agencies as they worked to incorporate AAR process. Among the specific problems DeGrosky noted were applying the AAR technique without regard to context, using AARs inconsistently, practicing informal or unstructured AARs, engaging in unsystematic preparation for AARs, and improperly training AAR facilitators.

A third issue reflects the theoretical grounding of the technique. AARs are meant to serve a pedagogical purpose: to enhance learning from experience. Their structure and function should follow logically from theoretical findings in various scientific domains. These include mainstream psychology (optimization of feedback, training methodology, and the behavior of small groups and teams), education (curriculum development and the behavior of facilitators), instructional technology (development and incorporation of methods for data gathering and replay), industrial psychology (design of performance appraisal systems, leadership, and the role of organizational influences), knowledge management (organization of curricular issues and their sequential presentation and mastery) and military planning and leadership. Previous attempts to understand the AAR process have typically been restricted to a subset of these areas, or have assumed a non-theoretically based approach. Consideration of theory will avoid duplication of effort and ensure that the AAR represents a flexible and powerful method for optimizing learning. The following paragraphs present foundations and recommendations for AARs that are based on a review of the theoretical literature.

Theoretical Background

Learning and cognition. Cognitive learning is a crucial portion of the AAR process. Soldiers must reliably observe and encode trends to make future predictions about battle status and potential outcomes. Cognitive learning theory concerns transfer of information from short-term to long-term memory.

There are two main components of the learning process as it pertains to the long term memory storage (LTS). Encoding is the process in which information gets "stored" into long term memory, while retrieval deals with accessing the information previously stored. When information is encoded into LTS, it is usually placed into a "cognitive network" or schema. When presented with an item from a schema, other items in the schema are subsequently easier for the brain to access (Crestani, 1997). As items occur together repeatedly in a person's environment, the association between them becomes stronger. Decay occurs when items in memory lose their connection, which occurs when there are long spans of time in which the items are not experienced or paired together (Wickens, Lee, Liu, & Becker, 2004). To take advantage of this cognitive structuring, AARs should focus on frequently and consistently providing multiple deep and meaningful cues to important items in memory.

Episodic memory is a term given to a learner's representation of an event and its relevant details. Researchers have demonstrated that individual encoding is susceptible to flaws, especially under stressful conditions (Wright & Davies, 2007). Flaws can occur due to limited attention capacity during the event, or the mind incorrectly "filling in the blanks" of what was missed perceptually (Hyman, 1999). AAR practitioners should be aware of problems with faulty episodic memory, because acceptance of a common "ground truth" is crucial for acceptance of the feedback given in the AAR.

Situation awareness (SA), another cognitive construct of interest, is defined as a person's general understanding of real time changes in their surrounding environment (Endsley, 1995).

There are three levels of SA: perceiving elements in the environment, understanding how the elements interact, and predicting how the elements will interact in the near future (Durso & Gronlund, 1999). AARs should allow participants to improve SA by highlighting which aspects of the battle were important to attend and which aspects were irrelevant. Facilitators should also be concerned with increasing the SA of the group as a whole, which involves facilitating team members' sharing crucial situational information.

The cognitive factors just listed depend greatly on individual effort. If knowledge is deemed to be too costly compared to the benefits, learners will benefit slowly (if at all) (Sternberg & Smith, 1988). If information is deemed trivial or unimportant, little or no effort will be made to attend the information presented. Facilitators should take proactive steps to highlight the potential value of understanding a process, situation, or phenomenon to ensure that important aspects of the lessons are retained.

Human cognition can also be limited by a person's attention capacity. Tasks may require more attention than a single individual is able to give. Given this, one potential focal point of an AAR is to identify task breakdowns due to an individual becoming overloaded, and discussing potential ways of dividing up the task among multiple individuals.

AARs should identify those individuals who are experts or quickly approaching expertise and encourage these individuals to participate in the discussion. Less experienced team members can gain considerable benefit from their perspective and experience.

Team dynamics. A team is defined as a small number of people who hold specialized roles or functions, and act dynamically towards a shared goal. The individuals of the team are interdependent and seen as a "working unit". Each member in the team should understand the other members' roles in addition to their own (Belbin, 1981), and communication is crucial for success. Military teams include Soldiers with differing ranks and experience, so when one member of a team is incapacitated another member may need to assume the role. Such transfer of duties and responsibilities often proves to be a considerable challenge for members who have not discussed the process before it happens or who may not have adequately acquired or refreshed their knowledge of others' roles. AARs are an appropriate time to discuss contingency plans if a team member should become incapable of performing their duties. In addition, the discussion may invoke a greater appreciation and understanding for other team members' roles, which in turn could impact a team's situation awareness and cohesiveness.

Communication is another crucial aspect of team performance. AARs provide the mechanism to identify and explore any communication breakdowns among team members. These situations should be explored and the participants should be encouraged to discuss why it happened and potential fixes to avoid a breakdown in the future. AAR facilitators can serve to make team members better aware of communication deficiencies or breakdowns, and may be able to suggest strategies for preventing such problems and keeping the team focused on the task.

Goal setting activities for individuals and the overall team have been demonstrated to be very important in the performance appraisal process (DeShon, Kozlowski, Schmidt, Milner, & Wiechmann, 2004). Having a specific goal to realize or discuss will provide a concrete, tangible item to discuss in an AAR. Any references made by the trainees to performance goals should be encouraged and fully discussed.

Poor team performance can result from a variety of causes. Members of the team may disagree over the authority within the group, causing a loss of identity with the team and team's shared goals. Team performance can break down when individuals manifest incongruent norms, low morale, poor team structure or roles, deficiencies in communication, and lack of appropriate feedback or criticism. Rewarding or punishing a specific individual can lead to decreased team goal commitment; for that reason feedback should often be directed at the group as a whole to ensure team accountability and cohesiveness (Nadler, 1979).

Feedback. Feedback, the heart of the AAR process, concerns providing individuals or groups with information about their performance on a task or set of tasks. Feedback is generally supported in being an important factor in increasing subsequent performances of a task (London, 2003). Theoretically, feedback consists of a source, a message, and a recipient, all of which play special roles in the feedback process.

Aspects of feedback are available from observers of the performance, the task environment itself, and the individual learner. Although feedback during an AAR frequently comes from outside observers, it is important to consider the other two sources. Task environment feedback and self-feedback are often well accepted and incorporated (Greller & Herold, 1975); however, if such feedback is incongruent with the overall AAR, learners could possibly disregard information within the AAR. Facilitators, when possible, should try to make sure that all sources point to a common conclusion. In modern training situations the task environment may be the best source for ground truth and can provide the best feedback on what happened. This serves to help eliminate any incongruity among or between observers and individual learners.

Individuals providing feedback may differ in terms of their credibility and power. More credible sources will have their feedback accepted and acted upon more readily, whereas sources that are deemed non-credible will have their feedback regarded as faulty, incorrect, or irrelevant. Individuals perceived as having more power will have their feedback attended to regardless of the feelings of the recipient. Given this information, a facilitator should take great care in establishing and maintaining good credibility, and ensuring that all participants feel the feedback given refers to their actual performance.

The information conveyed within an AAR should be clear and non-ambiguous, as nonspecific feedback will have little effect on performance (Annet, 1969). The feedback message should reduce uncertainty in terms of the outcome of a particular task. AARs should focus on delivering clear, specific, unambiguous feedback to the training audience that reduces uncertainty as to what happened and sets the conditions for introspection and discussion that will enable the trainees to reach a clear consensus on the reasons why a particular outcome occurred.

Whereas the above paragraphs have generally involved the AAR administrator's perspective, it can be very instructive to adopt the learner's perspective. There are four levels of recipient's processing of feedback: perception of the feedback, acceptance of the feedback, desire to respond to the feedback, and the intended response (Ilgen, Fisher & Taylor, 1979). Each of these stages can be impacted by the three component sources: the source, the message, and the recipient.

Perceptions of feedback that can be altered by the source, such as self and task feedback, are generally perceived more readily than outside observer feedback. Feedback messages can differ in timing, sign, and frequency. Timing refers to the amount of time between the behavior

or task in question and the delivered feedback. A closer pairing facilitates the linkage between the task and the feedback received. The sign of the feedback refers to positive or negative, with negative feedback informing the individual when a task was done improperly or incorrectly. Negative feedback is not perceived as readily as positive feedback (Halperin, Snyder, Shenkel, & Houston, 1976). Finally, the frequency of the feedback is how often it is delivered. Frequent, consistent feedback will have more of an effect on subsequent performance.

Acceptance of feedback is the stage in which, after being perceived, information is judged to be accurate or not. The receiver decides whether the feedback corresponds to displayed performance. If so, feedback will likely be accepted. Sources deemed more credible will have their feedback accepted more readily, and positive feedback seems easier for individuals to accept than negative feedback. Desire to respond is the stage in which the receiver decides if they will alter their task performance based on the feedback received. Feedback should be designed to bolster the recipients' feelings of competency, while reducing the feeling of external control. Where possible, feedback should be positively framed, and should include information above and beyond the information already retained by the recipient.

The final stage is the intended response. A learner's intended response often corresponds heavily with goal setting and checking, as feedback is essential to the goal process. Specific goals lead to a more substantial increase in performance than general goals that fail to guide specific behavior (Steers & Porter, 1974). Difficult goals also stimulate increased performance more than easy ones. The more personal control over goals set, the more performance will increase. To support specific goals, specific, actionable feedback should be provided. Self developed actionable feedback will be accepted by all, therefore the facilitators have the responsibility to use appropriate techniques to help trainees to develop that consensus in order to take advantage of this.

The four-step process just described suggests that AAR facilitators should attempt to ensure that each person in the AAR agrees with the feedback that is given so that it will not be disregarded. Feedback should also be delivered in a timely fashion. Because self-feedback will be accepted more readily, facilitators should try to have participants generate their own personal feedback when addressing issues. AAR facilitators should work hard to maintain themselves as credible, energetic, reliable, and representing the participants' best interests. The AAR designer and AAR facilitator should also help the participants develop challenging, specific goals for future performance, and subsequently offer specific feedback to provide a means of monitoring progress towards these goals.

As our research team became familiar with the applied military practice of AARs, we evaluated our observations against the preceding theoretical conclusions. In turn, we refined our theoretical understanding of AAR construct foundations by considering real-world constraints.

Military Research Efforts

We identified in available literature key individual researchers in the military domain who have contributed to understanding and improving the AAR process. Among these are Larry Meliza, David Bessemer, and John Morrison. An early report concerning the implementation of AAR within the SIMNET architecture was authored by Meliza along with personnel from the Fort Knox field unit of the Army Research Institute (Shlechter, Meliza, Burnside, & Bessemer, 1992). Other works by Meliza have included a 1999 report addressing the automation of AARs

(Meliza, 1998) as well as a landmark publication with Morrison concerning the foundations of the AAR method (Morrison & Meliza, 1999).

The agencies or organizations that have concerned themselves with AARs span government agencies as well as industry. Each of the armed forces has adopted a version of AAR, with the U.S. Army leading the way. The most influential military research concerning AAR has been conducted by the U.S. Army Research Institute and the Center for Army Lessons Learned (CALL). These groups have produced numerous reports and guides that describe methods for conducting AARs and often include recommendations for their effective implementation and facilitation. Most of the military AAR research in the past 10 years has shifted from foundational and theoretical work to application of the techniques under emerging training technology conditions or development of technologies to support the established AAR process. The fundamental research conducted prior to 1999 has been well documented and described in other works (Salter & Klein, 2007; Mastaglio, Jones, Bliss & Newlin, 2007) and will not be repeated here. Below is a discussion of some of the significant efforts conducted by military researchers in the more recent past to extend AAR into emerging application areas or to exploit emerging technologies to enhance the conduct of the AAR.

The Army's Functional Area (FA) 57, Simulation Operations, Proponency Office published an extensive DVD-based AAR Toolkit that provides multi-media instruction, recommendations and a comprehensive set of example templates for trainers to use in the preparation and facilitation of AARs (FA-57 Proponency, 2003). This DVD was based on the conduct of planning, preparing, rehearsing, and conducting AARs as executed at the Combat Training Centers (CTCs). Though it is an extensive resource, most home station trainers do not have the infrastructure available to implement AARs as described in the DVD. This toolkit has not been widely distributed beyond FA 57 personnel so it had relatively little impact on the large population of Army trainers.

As part of a research program intended to enhance data collection and feedback capabilities in virtual training environments for dismounted Soldiers, ARI developed the Dismounted Infantry Virtual After Action Review System (DIVAARS) (Knerr, Lampton, Martin, Washburn, and Cope, 2002). DIVAARS provides a comprehensive suite of tools and capabilities to address the unique challenges and advantages of conducting AARs of virtual training exercises intended to support training of dismounted Soldiers. The system was envisioned to work with any Distributed Interactive Simulation (DIS) compliant virtual environment. DIVAARS received very positive ratings from Soldiers who participated in AARs conducted during the development of the system and it has served as a capabilities benchmark for follow-on efforts by both commercial and government organizations.

Another prominent researcher who contributed to the potential for applying emerging technologies to the enhancement of AARs is Jean Dyer (Dyer, Wampler, Blankenbeckler, 2005). Dyer et al. explored the potential to leverage the operational capabilities (computing power and information available) of the Land Warrior system to provide AAR aids. The Land Warrior system is a future dismounted Soldier system that includes a wearable computer and helmet-mounted display. This research addressed how such a Soldier system could be used to provide AAR aids to enhance the trainer's AAR dialogue with the unit, as well as what additional training capabilities could be embedded in the system's design to support the AAR.

Other researchers also explored the potential opportunities and challenges associated with the emerging ubiquitous employment of computer-based information systems. Meliza and Barnett (2006) researched the extent to which U.S. Army units equipped with emerging networked command and control systems must channel, manage, assess, and exploit information and requests. They observed that the building block relationships among these skills (e.g., channeling facilitates management) relates directly to the crawl-walk-run approach to training. At lower levels of proficiency in applying networked systems, more effort should be spent on information channeling and management, while assessment and exploitation become the foci at higher levels of proficiency. Their assessment of the requirement for the AAR process whereby organizations decide what happened, why it happened, and how to improve or sustain future performance concluded that it is “likely to be a key feedback mechanism for training units using networked systems”. Just as Dyer, et al, identified the opportunity to exploit the operational information provided by these systems as sources of AAR aids, Meliza and Barnett concluded that the information available from the networked systems could provide information relevant to identifying problem areas. This paper also addresses how the levels of operator network proficiency can affect the need for AAR aids.

Military research to develop tools to support new training conditions includes efforts such as the After Action Intelligent Review System (AAIRS) application developed for the Marine Corps Combined Arms Command and Control Trainer Upgrade System (CACCTUS) program (Jensen, Harmon, Nolan & Caldwell, 2006). This effort is focused on a visual timeline-based debrief toolset that enables instructors to quickly construct and present playback vignettes for salient training points. It identifies training points through the use of intelligent data collection and causal analysis methods. AAIRS records the training mission execution that includes a synchronized collection of exercising force audio communications and human in the loop interaction with system components (operational C4I and simulator interface tools). Key exercise data relevant to training points is tabulated by the debrief construction tool and presented visually along a timeline for instructor review. This facilitates a highly configurable AAR, where the presentation of each training point in the debrief can include descriptive causal analysis text, voice communications playback, and 3D views of the battlefield, either frozen in time (visually as a snapshot) or played back as vignettes.

Salter and Klein’s (2007) research report is highly relevant and timely for this research. In cooperation with the Operations Group of the Joint Readiness Training Center (JRTC) at Fort Polk, LA, they sought to provide an independent assessment of the conduct of AARs at JRTC. The JRTC is a key venue for AAR analysis because the likelihood of small unit leader involvement in contemporary decision-making situations has increased. The greater participation of junior leaders and Soldiers has brought a renewed focus on AARs conducted at platoon and company level. The researchers observed forty small unit (platoon and company) JRTC AARs in real time and via videotape. The AARs were compared to each other, and most importantly, to the Army standard as shown in Training Circular 25-20, A Leader's Guide to After-Action Reviews (Department of the Army, 1993). They also interviewed current and former O/Cs, and observed instruction provided to new O/Cs to supplement these observations. Current findings were compared with results of other research on AARs and similarities noted. As a deliberate byproduct of the research, a prototype AAR rating scale was created for possible use as a job aid or performance checklist or for use as an instructional tool during O/C training. The results of this research confirm earlier findings indicating that the AAR must be both a science and a craft. The steps in an AAR are well detailed in multiple source materials, and most O/Cs observed

appeared to understand the basic requirements. The O/Cs were well-trained, enthusiastic, and clearly interested in helping the units. However, many of even the most proficient O/Cs tended to err on the side of providing too much information, thereby turning the AAR into a critique or lecture instead of a discussion.

Another area of recent interest to military researchers is exploration of emerging technology that enables computer generated training performance feedback mechanisms intended to replace the human trainer or AAR facilitator. Scott Beal (2008) explored the application of a game-based training system both with the support of an instructor facilitator and as a standalone tactical training game. In this effort sixty-nine Infantry leaders participated in an experiment observing the difference between instructor-facilitated vs. stand-alone game-based training. The instructor-facilitated group worked with instructors and peers during their training exercises, while the stand-alone group performed the training missions with no interaction with others. A questionnaire was administered post-exercise to assess the participant's perception of training value, tactical decision implementation, and motivation. Results indicated that there was no difference in the decision making performance, however the leaders' perceived training value and decision making was impacted positively when training was accompanied by peers and/or trainers.

There has been a re-emergence of research efforts to explore improving the efficacy of more modern approaches to Intelligent Tutoring Systems (ITSs) to better support performance feedback using reflective tutoring in lieu of trainer facilitated AARs. One can readily find successful implementations of ITSs in support of the training of well defined tasks. However, Chad Lane's (Lane, Core, Gomboc, Karnavat & Rosenberg, 2007) work addresses the much harder problem of building an intelligent tutoring system for the ill-defined domain of interpersonal and intercultural skill acquisition. In this research the team considers mixed-result actions (those with pros and cons), categories of actions (e.g., required steps vs. rules of thumb), the role of narrative, and reflective tutoring, among other topics. The context for this work is an intelligent tutor for ELECT BiLAT, a game-based system to teach cultural awareness and negotiation skills for bilateral engagements. The tutor provides guidance in two forms: (1) as a coach that gives hints and feedback during an engagement with a virtual character and (2) during a system-generated AAR to help the learner reflect on choices made. Learner activities are mapped to learning objectives, which include whether the actions represent positive or negative evidence of learning. These underlie an expert model, student model, and models of coaching and reflective tutoring that support the learner. Durlach, Wansbury, and Wilkinson (2008) conducted training effectiveness analyses of the ELECT BiLAT system as a standalone training environment with its ITS-based AAR system and demonstrated a significant increase, by the Soldier participants, in post training performance.

The above research focuses primarily on technology to support AARs. To date, there has been little research to identify factors that support or inhibit the training effectiveness of AARs. The primary motivator of the current research was the lack of data on AAR effectiveness and the factors that influence that effectiveness. The present research hopes to initiate an effort to improve the training effectiveness of AARs in the US Army.

There is little doubt that the U.S. military, led by the Army, has been the primary intellectual energy behind the concept of the AAR. The above is only a sampling of research across the services in how they should be conducted and the implications for technology-based solutions for training and support of the AAR process itself. In a similar fashion, the military has

developed fundamental doctrine for employing the AAR. In the next section we will summarize the written guidance developed by the U.S. Army regarding AAR.

AAR Doctrine

The lead agency for both training and doctrine within the Army is the U.S. Army Training and Doctrine Command (TRADOC). Therefore, although the fundamental Army research agency on AAR has been U.S. Army Research Institute for Behavioral and Social Sciences, the command responsible for directing AAR implementation in the form of doctrine is TRADOC. TRADOC Regulation 25-36, The TRADOC Doctrinal Literature Program (2004) states that the purpose of Army doctrine is...

...standardize military principles, terms, and TTP throughout the U.S. Army. They form the basis for training, and the training products that support it. Training standards provide performance baselines to evaluate how well a task is executed. Together, doctrine and training form the key to Army readiness.

The regulation additionally states that the Army's "expertise" is "founded, to a large extent, on the intellectual capital of those who develop and contribute to...doctrine." The preparation and publication of doctrine serves as the Combination function within the Socialization, Externalization, Combination, and Internalization (SECI) model of the creation of organizational knowledge (Nonaka & Takeuchi, 1995). Doctrine collects the extracted expressed and analyzed learning of individuals within the organization and subsequently internalizes that learning across the organization. Studies and other research are not doctrine but rather the externalization of individual knowledge—the elicitation of otherwise tacit knowledge that will eventually evolve into doctrine. The biggest discriminator between research and doctrine is that research is likely neither read nor known of by the body of practitioners, who will be influenced by doctrine.

AAR has become an accepted practice across the Army and in turn the AAR concept has become imbedded into Army doctrine. Field Manual 25-4, How to Conduct Training Exercises (1984)—which is still available from Army Knowledge On-Line (AKO)—has an appendix on post-exercise activities, which describes conducting AARs. Training Circular 25-20, A Leader's Guide to After Action Reviews (1993) is the Army's stand-alone document describing AARs and provides guidance on their conduct. Field Manual 7-1, Battle Focused Training (2003) has an appendix on the AAR, which mirrors the information found in TC 25-20. The Research team found additional AAR doctrine within an appendix in FM 6-01.1, Knowledge Management Section (2008). Also, the Team examined MCRP 3-0A, Unit Training Management Guide (1996). As the Team was interested in instructions to AAR practitioners, the Team reviewed each manual to extract specified instructions. The Team organized these extracted instructions under associated study Issues and Sub-Issues and then conducted analysis to identify the current state of AAR doctrine.

These doctrinal examples provide a dated perspective of the AAR. The Army's objective is to update, or at least review, doctrine every five years (TRADOC Regulation 25-36, 2004). Army doctrine on the execution of the AAR reflects, with some minor updates, the doctrine contained in the original TC 25-20, which at the time of this research was seventeen years old and was written prior to significant changes in both training modalities and in training perspectives and approaches.

The doctrinal examples describe an AAR as a discrete event that exists almost external to the training process. Guidance on the integration of AARs into training events is minimal and very general, referring to scheduling AARs after “critical” events without defining what constitutes criticality. Some of the doctrine provides examples of critical events, examples that look to be based upon steps within general tactical sequences.

Doctrine briefly describes the requirements for O/C or facilitator selection, specifically knowledge and rank, with knowledge having the higher priority. Doctrine also provides some guidance to O/Cs on pre-AAR requirements, specifically on the necessity for accurate and thorough observation capture (note taking) and positioning for effective observation. The doctrine, however, describes an O/C as a discrete actor in the training process, separate from the training audience and reporting information to a senior O/C. Doctrine, which is heavily based on TC 25-20, published in 1993, does not take into consideration the numerous technological advances that today afford AAR practitioners a more complex information environment.

Doctrine fails to identify linkages between the AAR and other aspects of the training or learning process. This is most pronounced in its failing to identify linkage between the AAR and normal facilitator-training audience interactions including one-on-one reviews, with the impression from the doctrine that the AAR is the first and only interaction between the facilitator and the training audience.

AAR doctrine becomes much more prescriptive when discussing the execution of the actual AAR, providing very specific instruction on the sequencing of events within the AAR. The doctrinal examples describe a somewhat directive AAR, implying almost complete control by the facilitator of the AAR flow, including discussions. This includes assumptions that the AAR’s aim is to include all observed learning points. Execution emphasizes several interim means to success, especially group discussion, but is very sparse on instruction to facilitators on how to achieve these.

The primary facilitator behavior discussed is the use of open-ended questions, providing a definition for the reader but little discussion of what comprises an effective open-ended question or how to best deploy them.

The doctrinal examples are relatively silent on what occurs after an AAR from the facilitator’s perspective. It is in this area where the doctrine mostly portrays the AAR as a singular event. Post-AAR instructions are directed to unit commanders vice facilitators and discuss what to do with AAR results, specifically retraining. There is little to no discussion of what the facilitator does after the AAR, especially on how multiple AARs can be linked to cause the most effective and efficient training.

Method

Observed Practice

A major effort of this investigation was to determine the current state of AAR practice across varied training modalities and then to compare that state to the theoretical foundations for AAR as discussed above. The team developed an understanding of the current state of the AAR through interviewing AAR practitioners at two centers of Army training, the NTC and the BCTP, and observing AARs as practiced by these organizations. Additionally, the team collected data through a web-based survey. The population for this web-based survey was defined as active duty Soldiers who have participated in one or more AARs. We collected sample data using

voluntary responses to an announcement of the survey deployed on Army Knowledge Online (AKO).

The research team used an established methodology for eliciting, consolidating, analyzing, and visualizing individual tacit information. This methodology, called the Study of Organizational Opinion (SO2) (Mastaglio & Jones, 2009), was developed from Customer Relations Management (CRM) principles, and has been proven in a variety of research efforts, including assessment of training and elicitation of organizational requirements. SO2 is highly effective as an interview and surveying technique to acquire the in-depth insight required for analyzing organizational change or transition. The research team chose to use SO2 for this research due to its demonstrated ability to quickly and accurately extract complex insights from participants responses and inputs.

SO2 starts by mapping the organization and the potential survey population. The next step in SO2 is to develop Issues from research goals and objectives. An Issue is a broad inquiry, often associated with executive level information requirements. Practitioners then conduct a hierarchical deconstruction of these Issues into Sub-Issues and eventually Questions. Sub-Issues are more focused inquiries often associated with management level information requirements. Questions are crafted so they can be delivered to and answered by a respondent who we reasonably expect to have the experience and insight to provide the desired information. Respondents are identified concurrently with Issue deconstruction, and are logically grouped based upon organizational and research requirements. Questions are deployed to respondents through on-line questionnaires, written surveys or interviews. Answers are then consolidated and are aggregated into Sub-Issue Findings and eventually Issue Findings, with analysis and sense-making at each aggregation.

This investigation started with the hypothesis that the AAR has become a significant component of training and therefore there are key implications that must be considered throughout the training management cycle. To provide structure to this investigation, the team started with an existing training management model. The team evaluated two training management models, the US Army's Training Management Cycle and the US Joint Forces Command's (JFCOM) Joint Training System (JTS).

The team initially examined the U.S. Army's Training Management Cycle (FM 7-1, 2003). This training model consists of four sequential processes: Mission Essential Task List (METL) Development, Planning, Execution, and Recovery. The process we focused on for this investigation was Execution. Execution is divided into three components: Preparation for Training, Conduct of Training, and Recovery from Training. According to FM 7-1, AARs occur during the Conduct of Training component.

The JTS consists of four phases that are similar to the Army model: Requirements, Plans, Execution, and Assessment (CJCSM 3500.03A, 2002). As with the Army's model, this research focused on the third phase of the JTS, Execution, during which the AAR occurs. The Execution phase of JTS is described by the Joint Exercise Life Cycle (JELC). The JELC has five stages: Design, Plan, Prepare, Execute, and Evaluate. The AAR is included in the Execute stage. After comparing the two models, we chose the JTS/JELC because it provides more structure and more detailed definition of the training management process than the Army model. The team based the research Issues on the stages of the JELC combining the first three stages, Design, Plan, and Prepare, into one Issue. The key Issues for this effort were:

Issue 1: How are AARs considered during the Design, Planning, and Preparation of Training?

Issue 2: How are AARs considered during the Execution of Training?

Issue 3: How are AARs considered during the Evaluation of Training?

NTC and BCTP Interview Methodology

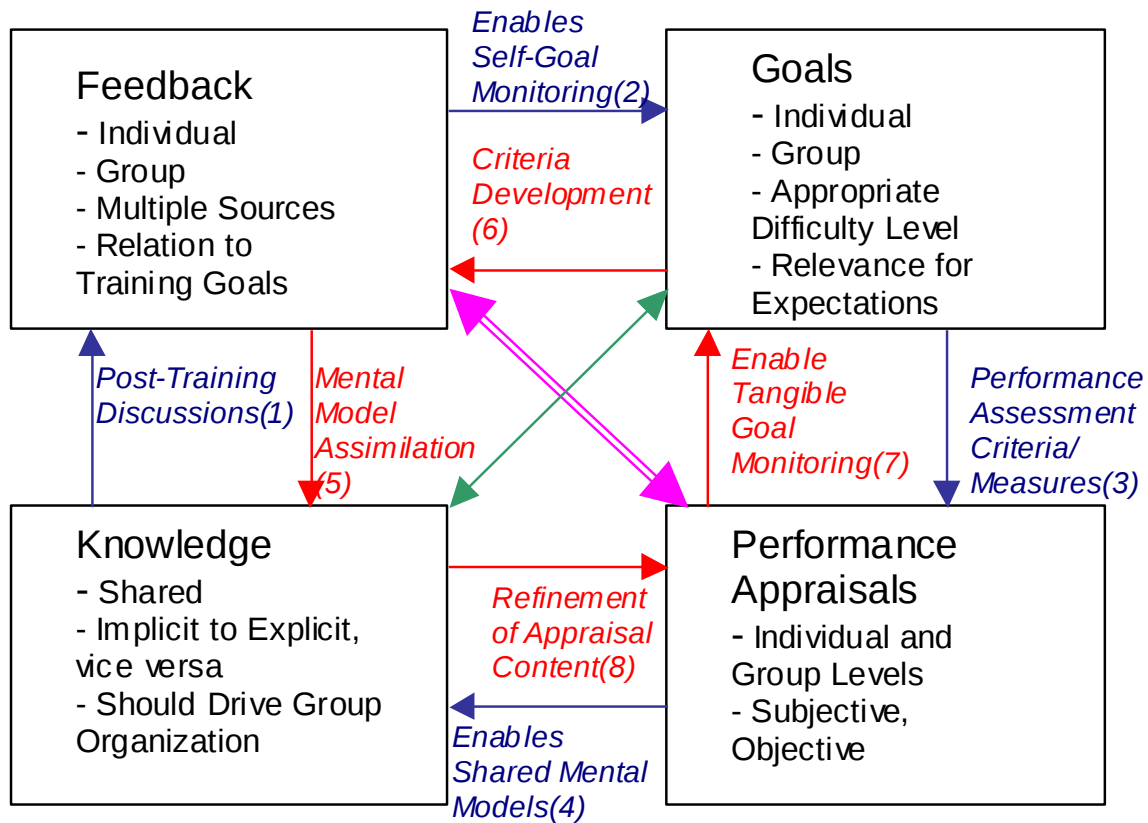
For the AAR practitioner interview portion of the investigation, each of these Issues were deconstructed into nine Sub-Issues and forty-nine interview Questions. The AAR occurs in the Execution Phase, therefore, most emphasis was placed on Issue 2. In addition to Questions developed from Issues, there were eleven demographic Questions and four additional Questions that supported this effort but did not derive directly from one of the three above issues, for a total of sixty-four questions.

Questions were presented to respondents during face-to-face interviews conducted at the NTC over a three-day period and at BCTP over a four day period. With the exception of several demographic questions, all questions were open-ended and the interviewer was allowed to follow-up to refine respondent answers. Thus, each interview was extensive, lasting on average two hours. Prior to interviews at the NTC, a rehearsal was conducted at the U.S. Army's JRTC. This rehearsal served to select and refine questions and improve interview techniques. In all, we observed five battalion and one brigade AAR at NTC, and one AAR at BCTP. We interviewed six OCs at NTC and four at BCTP. In addition, at JRTC we observed one company and one brigade AAR, and interviewed three OC teams of one officer and one NCO (total of six OCs).

Upon returning from the NTC and BCTP, we archived the twenty-plus hours of interview protocols into a central database. An analysis of individual interviewee responses followed. Following the SO2 methodology, these were aggregated into Consensus Answers and Sub-Issue Findings for each organization (NTC and BCTP) separately. These Sub-Issue Findings by organization were then consolidated into an overall Consensus Sub-Issue Findings and Issue Findings. Organizational and Consensus Sub-Issue Findings and Issue Findings are provided below.

Task Analysis Data Gathering Process

A central part of our experimental efforts was to observe the practice of AARs in U.S. Army units. To accomplish this goal, two forms of a cognitive task analysis questionnaire were developed according to the procedures outlined by Crandall, Klein, & Hoffman (2006). In ideal task performance situations, task analysts invest several hours to observe and interview task performers. They also engage subject matter experts in the construction and modification of AAR observational tools. However, time and access constraints prohibited us from adhering to an exhaustive task analysis process. We created a structured observation process that would allow our team to draw accurate and detailed conclusions about the practice of AARs, one that would inform existing theory in the areas described earlier. In so doing, we attempted to stay as true as possible to accepted task analysis practice. Our efforts were based upon our previously developed theory which we were seeking to validate, the ITAAR developed by Mastaglio, Jones, Newlin, and Bliss (Mastaglio et al., 2007). The ITAAR model is shown in Figure 1 (for a thorough description of the ITAAR model, see Bliss, Minnis, Wilkinson, Mastaglio & Barnett, in preparation).



- Knowledge of task facilitates goal setting; goals structure the knowledge dispersement process.(9)

- Feedback is formalized within performance appraisals; performance appraisals are the mechanism for feedback.(10)

1 Wiener (1948)

2 Saavedra, Earley & Van Dyne (1993); Matsui, Kakuyama & Onglatco (1987)

3 Mager (1984)

4 Cannon-Bowers & Salas (2001)

5 Smith (2001)

6 Schmidt & Kleinbeck (1990)

7 Jones (1997)

8 Dyer (1986)

9 Dyer (1986); Saavedra et al. (1993)

10 Patrick (1992)

Figure 1. The integrated theory of after action review (Mastaglio et al., 2007).

To facilitate our data gathering, one questionnaire included items to be answered by military subject matter experts familiar with the AAR process. The other form of the questionnaire consisted of a checklist of items drawn from research literature concerning effective AARs (Mastaglio, Jones, Newlin & Bliss, 2007). The items on the questionnaire and the checklist reflected the theoretical structure of the ITAAR. The observations that we made represented frequencies observed for each item on the checklist.

The specific behavioral items included on the checklist and the ITAAR construct they relate to were as follows:

- Gives Individual Praise (feedback)
- Gives Individual Criticism (feedback)
- Gives Group Praise (feedback)
- Gives Group Criticism (feedback)
- Asks a Rhetorical Question (learning)
- Asks a Question Directed at the Group (team operations)
- Asks a Question Directed at an Individual (learning)
- Encourages Group Discussion (team operations)
- Engages in Lecturing or Instructing (leadership)
- Refers to a Performance Goal (learning)
- Discusses an Action Summary (feedback)
- Uses a Technical Aid (leadership)
- Uses an Example to Clarify a Point (leadership)

Following development of the checklist, the experimenters arranged to observe six 2-hour AARs at the NTC, Ft. Irwin, CA, and additional AAR sessions at Ft. Stewart, GA, Ft. Polk, LA, and Ft. Leavenworth, KS. AARs observed were at the brigade and company level. All observations were conducted in real time as the events unfolded. However, at the request of the government, the research team minimized its obtrusiveness by observing many of the AAR sessions at a remote facility by video camera.

Web-Based Survey Methodology

Our interviews of AAR facilitators, as discussed above, provided their perspective on the AAR, however these interviews did not include perspectives from the other group of major AAR participants, the training audience. To obtain this perspective, the team created an online web survey. Following MYMIC's SO2 process, the team crafted questions based upon existing study-matrix Issues and Sub-Issues. The team decided that Issue 3: "How are AAR results incorporated in future AAR practices?" was not pertinent to our survey of training audience participants and, therefore, no questions addressed this issue. The resulting on-line questionnaire contained twenty-seven questions.

In order to maximize survey completion, we crafted mostly closed questions—those with either multiple choice or Likert scale answers. Within the survey, there were six sets of questions grouped by common theme (i.e., sets of Likert score questions regarding the use of audio, video, etc. within the AAR were grouped together). These sets each provided insight at both the high level, in terms of information regarding the overarching question, and at the individual question level. In order to maximize the opportunity for additional feedback, there

were also three open-ended questions at the end of the survey to allow respondents to provide unconstrained responses.

Table 2. *Breakdown of Questions by Issue*

Issue	# of Questions
Demographics	6
Issue 1	6
Issue 2	12
Issue 3	0
Other	3
Total	24

The survey collected limited demographic information. Due to the breadth of the survey population—serving Army personnel—the survey team decided not to pre-identify respondent groups.

The team deployed the survey via an announcement on the AKO main page. For the convenience of users, the team built in the ability for respondents to save their answers at any time, close the survey, and return later to complete it.

As with the interview effort, the Team consolidated the individual answers into a consensus answer for each of the twenty-four questions. Using the SO2 methodology, these responses were analyzed to determine Sub-Issue and Issue Findings. Additionally, the team used the demographic data to identify logical respondent groups based upon statistically significant linkages between demographic information and consensus answers identified during analysis. This resulted in one key demographic factor—level of military experience—that was statistically significant for some questions.

Results

The first step taken to analyze the results was to ensure that the recorded observations were legible and intelligible, and that they were organized according to military unit. The experimenters attempted to observe a cross-section of different sized units, so that AARs reflected a diversity of unit sizes and experience levels. Units observed included on-screen or in-person groups ranging from approximately 25 to 100 Soldiers, representing ranks that included upper level noncommissioned officers and commissioned officers. Within the various observed groups, one officer was designated as a battle commander (BC). This leader generally served as an intermediary between the AAR facilitator and the training group. In most cases, the target AAR was conducted mid-way through a training rotation.

The observational data were then transcribed verbatim, and were organized according to valence (positive or negative examples of witnessed behavior) and specific ITAAR constructs represented. Frequency counts were then tallied to determine how often similar observations were made of facilitators and group members across AARs. The findings are summarized here. For a more in-depth view of the data, see Mastaglio, Wilkinson, Bliss and Jones (2010).

Observations. Because observed groups were military units, we observed a fairly strict adherence to the chain of command by the trainees. When trainees asked questions during the AAR, such questions often were directed to or through the facilitator. AAR sessions were generally three hours long, with a break given at the half-way point. Without exception, groups were aware that the AAR sessions were being recorded for concurrent or subsequent review. This, along with the presence of commanding officers, may have served to restrict the volume and content of the questions and the flow of information.

It is important to stress that observed AARs reflected formal events, not informal “hot washes” at the training site. We have organized our findings by associating observations with construct elements within the ITAAR model. We also separated our observations according to their relevance to the facilitator or the group as a whole (we discuss each below). In addition, we counted both the positive and negative behavior observations for each site.

The content of the AAR dialog generally occurred at a high level. Rather than specific comments, personnel verbalized goals which often precluded targeted actions for remediation. Similarly, much of the commentary represented clarification of comments or problem elements, not the generation of solution and alternatives. In cases where effective dialog occurred, it tended to revolve around emotional expression (e.g., trust, frustration, or surprise). Generally, there seemed to be an abundance of “ground truth” from training exercise recordings. What was missing was summative or accurate evaluative commentary.

Facilitator Insights. At the beginning of our experimental observation periods, we were usually told that facilitators had been trained to conduct AARs. This did appear to be the case across installations and situations, as facilitators tended to follow a common procedure. That procedure included introductory statements clarifying the purpose and pedagogical philosophy of AARs, listing of goals to be achieved during the AAR, presentation of open-ended questions designed to instruct (Socratic style), presentation of “ground truth” information designed to enhance Soldier SA and particular roles, use of technology media to encourage cohesion, presentation of individual awards, and encapsulation of goals for the subsequent training period.

Specific observations revealed that, as a whole, instructors appeared to be effective in accomplishing their goals. Nine positive comments indicated that they were generally organized, centered on performance improvement, willing to relinquish control of the session when appropriate (often to the BCs), willing to positively reinforce effective behaviors and constructively identify ineffective ones, apt to use personal anecdotes to illustrate pedagogical points, and fluent with technology use.

The four negative facilitator comments noted tendencies to ask broad or leading questions, focusing on task issues at the expense of individual strengths or weaknesses, and directing comments to individuals instead of collective units.

Group Insights. In contrast to the facilitator comments, group behaviors were commonly judged more negatively. In fact, of the eleven observations that were judged to be universal across AAR groups, eight were negative and three were positive. The positive comments included group members seen as knowledgeable, focused on performance goals, and eager to provide input to the AAR process. However, these observations were outweighed by frequent indications that group members were passive (mostly listening and providing little input), deferent to rank, focused on personal blame, reluctant to criticize, and unwilling to interact with the visual aid technologies available. In addition, there were physical aspects of the AAR

environment that hindered effective dialog. Those included high-ranking individuals consistently seated toward the front of the room and heterogonous rank representation within the AAR group. The net result of these aspects was that groups generally lacked adequate social interaction, even when problem solutions required group problem solving. In turn, this influenced facilitators to adopt a more directive, instructive presentation style.

NTC and BCTP Interview Findings

In the following section we identify each issue (Issue 1 through 3) and discuss overall findings at that level. To provide insight into how we reached the issue level findings next are shown the Sub-Issues and findings relative to them based on our analysis of respondent answers.

Issue 1: How are AARs considered during the Design, Planning, and Preparation Phases?

Issue Finding: Based upon the identified training event focus areas, facilitators plan the actions of the facilitation team to best support the training event. This includes a data collection and management plan, which details how appropriate assets, both other facilitators and instrumentation, are positioned in time and space to collect critical information while minimizing possible disruptions to the training scenario. Facilitators prepare by meeting their counterpart(s), who are responsible for unit performance and with whom they will most often interact. Also important during the pre-training event phase is the establishment of a positive and supportive relationship between the facilitator and the training audience.

1.1: How do AARs impact the design and planning of a training event?

Consensus Sub-Issue Finding: The AAR is an opportunity to temporarily emerge from a training scenario and its stressors to conduct a comprehensive review of a small number of performance requirements, focusing on what occurred and why.

The interviewed respondents represented OC/Ts from two of the Army's CTCs. CTC training is highly structured. AARs occur following the conclusion of a portion of the training event. Facilitators have no input into when this AAR occurs. Therefore, these respondents have little if any opportunity to impact the sequencing of their supported training. Respondents are able to influence training content. Their content changes arise from training unit objectives and current operational experiences and conditions.

1.2: How do AAR practitioners prepare for training event AARs?

Consensus Sub-Issue Finding: During planning and preparation for a training rotation, facilitators familiarize themselves with the scheduled training and unit training objectives. They use unit provided materials, such as standard operation procedures and past unit training assessments, to identify a general body of performance requirements and then review doctrine, tactics, techniques, and procedures (TTP), and operational examples to hone their knowledge. AARs are conducted within a formal facilitation structure and, thus, guidance from the O/C chain is critical for AAR planning and preparation.

Based upon identified training event focus areas that result from this process, facilitators plan the actions of the facilitation team to best support the training. This includes a data collection and management or coverage plan, or how they insure that appropriate assets are positioned in time and space to collect critical information while minimizing disruptions to the training scenario. Assets, including subordinate O/Cs, instrumentation, and other members of the facilitation team, are positioned to record "critical" events, these are defined as those

“friction points” that most impact mission accomplishment. The initial plan is reviewed daily to measure overall training success and to redirect exercise events and observer coverage when required to insure training objectives and focus areas are properly supported. Senior O/C guidance is also important in identifying critical events. Materials used to record and organize data are individualized and may include checklists, graphics, and charts as well as instrumentation, especially visual collection means, the latter are considered particularly powerful.

The final preparation for the facilitator is meeting their counterpart(s), defined as the individual(s) who are responsible for unit performance and with whom they will most interact during the training event. This relationship is important and should consist of a partnership with the facilitator serving as an extension of unit leadership. Also important during the pre-training event phase is establishing a positive and supportive relationship between the facilitator and the training audience.

Issue 2: How are AARs considered during Execution Phase?

Issue Finding: O/Cs prepare for the AAR through a series of preparation activities that take place during training event execution, such as identifying focus areas, or unit performance considerations for attention. For example, during the training event, data collection is a key task to support AAR preparation. In addition, facilitators identify individuals who might be more receptive to training and, therefore, better conduits for facilitating unit improvement during and after the AAR. They will also monitor unit limitations due to equipment or personnel that might result in an adjustment of training content or focus areas.

AAR preparation involves reducing the data collected to a manageable quantity that best supports the original training objectives. Senior mentors and, especially, counterparts are the decision authority in this process. In addition, facilitators support data collection and the “filtering” step by interacting with their counterparts DAR, which are simple, frequent, and immediate “hot washes” that allow collaboration in a private and informal manner. Leveraging the O/C structure allows the facilitator to achieve a breadth and depth of perspective, identifying what actually occurred, or “ground truth”, and why. This process allows the facilitator to develop a small number of focus areas for the AAR, usually three to five, though possibly more.

The goal of the AAR is training transfer, represented through the assignment of responsibility, changes to unit performance during a training event, and capture of changes in unit documents, such as SOP. AAR considerations include the establishment of ownership by the training audience over the issues and improvements identified during the AAR. Facilitators encourage group discussion, ask open-ended questions, and practice patient silence while refraining from hierarchical criticism and teaching. In addition, the facilitator also seeks to establish credibility with the training audience.

During the AAR, facilitators work to create a positive and comfortable learning atmosphere, promoting both physical and affective comfort. The purpose is to foster participation, discussion, openness, self-discovery, and ownership of the AAR and its outcomes. The facilitator may practice the behaviors he desires from the training audience, such as listening, attention, and focus.

Because the AAR is a discussion, a facilitator does not prevent members of the training audience from varying excessively from doctrine or other published processes, or from

established AAR objectives as long as the discussion is relevant to performance improvement. During these discussions, facilitators serve as knowledge providers, citing examples from either doctrine, the training event, or sources such as in-theater experience (i.e., a-ways).

Facilitators assess the effectiveness of the AAR through group participation and discussion. Non-verbal cues from the training audience will help the facilitator gauge acceptance of opportunities to learn by the training audience; these cues include eye contact, posture, attention, and note taking. Ultimately, AAR success is measured by the training audience acceptance of a manageable number of issues and assignment of responsibility for fixing those issues. This can be assessed based upon unit efforts to propose and execute agreed upon changes in future performance.

2.1: What are the AAR considerations during training execution?

Consensus Sub-Issue Findings: During the training event, data collection is a key task to support AAR preparation. In addition, facilitators are concerned with the receptiveness of training unit members and identify individuals who might be more receptive and, therefore, better conduits for facilitating unit improvement. Identifying focus areas, or unit performance considerations for attention, is central to facilitators. They will also monitor unit limitations due to equipment or personnel, which might result in an adjustment of training content or focus areas.

Facilitators interact with their counterparts in during action reviews (DAR), or “hot washes” (also called “green book AARs” or “hood top AARs”). They generally see these hot washes as critical, sometimes even more important than the AAR. The hot washes are important because they are simple, frequent, and immediate and because they allow the facilitator to interact with their counterpart in a private and informal manner. DARs may also be conducted to provide immediate feedback to trainees as long as doing so is not disruptive to the training.

2.2: AAR considerations during AAR preparation

Consensus Sub-Issue Finding: The AAR preparation process starts with an abundance of information and insights from operational and training instrumentation, including C4ISR system data and video recordings. During training, facilitators will view C4ISR systems at appropriate times to capture key events; they must also maintain flexibility to capture unexpected yet critical key events. The AAR preparation process involves reduction of the data to a manageable subset that best supports the original training objectives. Senior mentors and their unit-leader counterparts are the decision authority in this process.

Preparing for an AAR is defined as actions taken between the end of observed training and the beginning of a specific AAR. It is often accomplished in a relatively short period of time. Facilitators focus preparation on identifying what actually occurred, or “ground truth”, and why. They leverage the O/C structure to achieve a breadth and depth of perspective, using their own notes plus discussion with and notes from other O/Cs and from instrumentation. Instrumentation is important in showing ground truth, though facilitators warn it must be used in a positive manner as training audiences tend to fear that instrumentation generated data will be used as evidence against them. Facilitators also use material from previous AARs, either as building blocks for the AAR, i.e., standard questions or slides, or as varied models of performance, referred to as “a-ways”.

This AAR preparation is used to develop a small number of focus areas for the AAR, usually three to five, though possibly more. Having focus areas helps the facilitator organize and prepare for the AAR, even though facilitators do not expect the AAR to cover each focus area. DARs, or hot washes, are integrated into AAR preparation. Facilitators use discussion with counterparts and trends identified during hot washes to select and further develop key focus areas. They rehearse their AAR to insure they are familiar with the material to be presented and to coordinate with support personnel more so than for practicing execution. In addition, facilitators ensure the AAR emphasizes group vice individual performance by focusing on process rather than individual actions as well as using plural pronouns.

2.3: What are the AAR considerations in presenting the AAR?

Consensus Sub-Issue Finding: The primary consideration during presentation of an AAR is to establish training audience ownership of the issues and improvements identified during the AAR. Ownership is defined as a specific strategy for improvement, a plan to achieve that improvement, and responsibility being assigned to an individual for execution of that plan. Establishing ownership of an issue and improvement plan is more important than following a schedule, reviewing a set number of focus areas, or the quality or depth of discussion of a focus area. The goal is training transfer, represented through the assignment of responsibility, changes to unit performance during a training event, and capture of changes in unit processes, such as SOPs.

Facilitators work to have the training audiences to focus on “what happened, why it happened, how to fix it, and who is going to fix it,” in terms of collective performance. Group discussion is necessary to accomplish this and facilitators achieve group discussion through use of open-ended questions, which are targeted towards the group. Open-ended questions targeted towards specific individuals are used only when the group question is not achieving the desired discussion. Facilitators also use patient silence to evoke training audience member responses. They develop a question strategy during AAR preparation that includes follow-up questions and identification of which individuals should answer those questions.

Facilitators work hard to avoid adversarial hierarchical situations. For this reason, they avoid judgmental approaches and directive facilitation or “teaching.” They focus their efforts towards the group, avoiding individual attribution. They do this by focusing on unit process and on what happened and why, avoiding who. They also use plural forms and group-based verbal constructs. Though individual attribution may be desirable (e.g., highlighting positive individual performance), individual attribution of a negative nature is sometimes unavoidable. When this is the case, facilitators depend upon the professionalism of the training audience to avoid adverse impacts.

O/C credibility with the training audience is essential to effective facilitation. They establish credibility through personal experience and demonstrated knowledge, both doctrinal and situational. Facilitators are subtle in advertising their experience, being aggressive can trigger a defensive attitude in their counterparts or entire training units. Uniform patches and badges are a passive means to advertising experience. Working experience into informal discussion is a more active means. AAR participation is severely restricted to the training audience and personnel external to the training audience are usually not allowed to engage in the AAR.

2.4: What are the AAR considerations in interacting with the training audience?

Consensus Sub-Issue Finding: In the AAR, facilitators work to create a positive and comfortable learning atmosphere. The purpose is to foster participation, discussion, openness, self-discovery, and develop ownership of the AAR and its results. They achieve physical comfort within the AAR by allowing participants to remove awkward uniform items. They achieve affective comfort through an emphasis on the fact that the AAR belongs to the unit and is a learning event. They may also use humor to encourage affective comfort. In addition, facilitators focus on active listening, demonstrating expected AAR participant behaviors, and further fostering group participation. Facilitators are also aggressive at note taking, as visual notes from the discussion can further focus the discussion and again demonstrate to the training audience attention and other desired behaviors.

Facilitators allow training audience discussion, as long as it is relevant to improved unit performance, to vary freely from planned topics because the discussion itself is an objective of an AAR. Their experience has shown that free discussion normally does not vary significantly from training results and that it supplies opportunities for the facilitator to extract learning points that support AAR objectives. As a result, when the training audience is speaking, facilitators remain mostly quiet and allow the discussion to progress. Similarly, the facilitator does not prevent members of the training audience from varying excessively from doctrine or other published processes. Rather, the facilitator focuses the AAR on self-discovery, helping the training audience talk through new perspectives, focus on cause and effect, and identify how the non-doctrinal process may or may not be better than published methods. During these discussions, facilitators serve as knowledge providers, citing examples either from doctrine, the training event, or other sources such as theater experience (i.e., performance models or “a-ways”).

It is recognized that training groups are often tiered. The first tier includes primary participants and targeted learners of the AAR, or active learners. The second tier primarily observes and learns passively. Often, facilitators will direct questions to the second tier to generate information or positions within the AAR discussion to foster discussion by the first tier.

Facilitators assess the progress of the AAR using the amount of participation and group discussion as a gauge. They also look for non-verbal cues to the training audience’s acceptance of the learning opportunity through eye contact, posture, attention, and audience note taking. Should the facilitator assess that the AAR is not progressing, they will respond by moving to the next focus area. Facilitators avoid confrontation between the facilitator and the training audience by pre-AAR coordination with counterparts. When confrontation does occur, they use knowledge of doctrine, TTPs, and SOPs to depersonalize and diffuse the situation. Facilitators actually avoid participation by leadership when AARs are not progressing in order to keep their counterparts neutral. Ultimate AAR success is measured by the acceptance of a limited number of issues and responsibility for fixing those issues, exhibited by unit efforts to propose and execute performance changes.

Issue 3: How are AARs considered during the Evaluation Phase?

Consensus Issue Finding: Post-AAR, facilitators follow through by using the AAR results to identify ways to positively impact training in the future. The following three strategies for doing this were identified in this research:

- reviewing results with facilitator counterparts
- socializing results with fellow O/Cs, especially superiors
- adjusting future training events to provide an opportunity for the training audience to practice planned improvements.

Post-AAR activity is also centered on determining metrics of training transfer for future performance. Facilitators focus on identifying these unit performance changes to determine if they were accepted by the training unit.

AAR results also produce various changes to AAR facilitation strategies over time. As a result, facilitators may select more complex and challenging areas in which to focus the AAR in the future. One example is an effort to be more “patient” and to emphasize non-AAR interactions more over time. There are a variety of methods for incorporating AAR results into future practices. These include identifying trends, discussing these trends with other O/Cs, comparing trends to what is occurring in theater, and modifying training events to front load associated training events within an exercise as a result. In addition, “sterilized” AAR “a-ways” can be saved for use with future training audiences.

3.1: How are AAR results incorporated in immediate/short-term changes in performance?

Consensus Sub-Issue Finding: Facilitators and training audiences emerge from the AAR with a contract for improvement. The following are three strategies for following up on AAR results: review of results with facilitator counterparts; socialization of results with fellow O/Cs, especially superiors; and possible adjustment of future training events to provide an opportunity for the training audience to practice planned improvements. Post-AAR activity is also centered on determining the level of training transfer in terms of changes in performance. They follow through on identifying unit performance changes to determine if these are really implemented.

Facilitators do not normally follow up with individual members of the training audience regarding participation in the AAR unless the individual was so disruptive or adversarial that it significantly impacted the AAR.

3.2: How are AAR results incorporated in long-term changes to performance?

Consensus Sub-Issue Finding: AAR results produce various changes to AAR strategies over time. They may also cause modification to training events or the need to select more complex and challenging AAR foci. One example is an effort to be more “patient” and emphasize non-AAR interactions more over time. Another is the modification of the training event itself.

3.3: How are AAR results incorporated in future AAR practices?

Consensus Sub-Issue Finding: There are a variety of methods for incorporating AAR results into future practices. These include identifying trends, discussing these trends with other O/Cs, comparing trends to what is occurring in theater, and modifying training events to front load associated training events within an exercise as a result. In addition, they save “sterilized” AAR products for use with future training audiences.

Issue 4: Additional insights and observations.

During data collection, especially the interview mode, when following the S02 methodology there are always opportunities for additional insights relative to the research area and overall goals of the project, some of these deriving from additional information provided by subjects interviewed. Therefore, we try to capture those insights and observations even though they do not always fit within the Issue/Sub-Issue structure. In this section we will discuss relevant results from our interviews which add depth of understanding about AAR as currently practiced.

Facilitators identified a number of challenges present in AAR facilitation as well as important skills and techniques for both junior and senior leaders to address these challenges. These provide suggested areas of focus for AAR facilitator training.

Obtaining comprehensive and accurate training event facts and data is a significant challenge for the AAR facilitator, as well as filtering these observations for potential issues to incorporate into the AAR. Crafting and asking open-ended questions, especially a question that generates group discussion, is a challenge as well since the issue must be “deep” enough to be accepted by the training audience. A final challenge is the execution of identified “fixes” to future performance.

Both junior and senior leaders should focus on fostering training audience participation, have a call plan, avoid talking too much, and be comfortable waiting for the training audience to fill silences. In addition, in recognition of the role of facilitator, as opposed being a formal instructor, junior and senior leaders should learn to be non-adversarial, to use open-ended questions, and to listen and allow the unit to talk. Also facilitators should learn to display appropriate affective behaviors, including professionalism, confidence, and passion. Senior leaders, in particular, should be more cognizant of the big picture, generational differences, and prepared to incorporate teaching opportunities into AARs as needed.

4.1 Which steps in the AAR process present the most significant challenges and describe them?

Consensus Finding: Obtaining comprehensive and accurate training event facts and data is a significant challenge, as well as filtering these observations for potential issues that can be incorporated into the AAR. Crafting and asking open-ended questions, especially a question that generates group discussion, is a challenge as well since the issue and/or supporting visualizations must be “deep” enough to be accepted by the training audience. A final challenge is the execution of identified “fixes” to future performance.

4.2 What AAR skills or techniques would you teach to junior leaders?

Consensus Finding: Important AAR skills or techniques for junior leaders include the following.

- fostering training audience participation
- developing and using a call plan
- avoiding a tendency to talk too much
- becoming comfortable with waiting for the training audience to respond to periods of silence

Other skills include not becoming adversarial, the use of open ended questions, focusing on basic questions, and listening, or allowing the unit to talk. Finally, junior facilitators should learn to display appropriate affective behaviors, including professionalism, confidence, and passion.

4.3: What AAR skills or techniques would you teach to senior leaders?

Consensus Finding: Senior leaders should be taught the same skills as junior leaders, to foster training audience participation, e.g., by minimizing the number of slides used for an AAR and instead focusing on unit discussion. Senior leaders should be more cognizant of the big picture, generational differences, and incorporate more teaching into AARs.

Web-based Survey Findings

Demographics. The survey successfully collected responses from a large sample of Soldiers, dispersed across all ranks and experience levels. In total, 910 respondents provided some answers to the survey and 831 respondents completed the entire survey. Respondents ranged across three levels of experience: 231 were Novice Soldiers with 0 – 7 years of experience, 301 were Mid-Career Soldiers with 8-15 years of experience, and 378 were Career Soldiers with 15+ years of experience. Respondents also came from all Army ranks. The spread of ranks is close to actual Army demographics as of FY 2008 (2) (Maxfield, 2008).

The majority of respondents described themselves as having at least some experience leading or facilitating AARs (89.97%). Respondents reported leading an average of 13.65 AARs within the last twelve months; compared with participating in an average of 20.84 AARs over that year.

Table 3. *Spread of Soldier Rank*

Rank	Respondents	Survey Demographics	Army Demographics
Specialist	121	71.16%	83.76%
NCO	324		
Senior NCO	199		
Warrant Officer	10	2.53%	2.7%
Chief Warrant officer	13		
Company Grade	126	26.29%	13.51%
Field Grade	107		
General Officers	5		

Survey consensus answers and findings. In the following section we describe the results of our analysis of respondent answers and the resulting findings for Issues 1 and 2 and their sub-issues. Again, since the consensus answers reflect sub-issue findings which in turn aggregate to form an issue finding there is some degree of redundancy in this discussion and the reader is encouraged to review the subordinate discussions if they are interested in how overall findings were derived.

Issue 1: How are AARs considered during the Design, Planning, and Preparation Phases?

Respondents reported that the AAR had a role within training but that role was not central. Respondents preferred shorter, more frequent AARs or other performance reviews. Respondents reported that performance models—how other units executed similar missions—were the most powerful AAR tool, with models from theater operations possessing the greatest legitimacy.

Sub-Issue 1.1: How do AARs impact the design and planning of a training event?

Respondents indicated that the AAR has a role within training, though not a central role. They reported that the AAR provides less than 50% of the training value compared with other aspects of a training event. Of four potential methods of reviewing performance, respondents thought shorter, more frequent AARs were the most effective but also thought self reflection and face-to-face discussion with OC/T or evaluator were effective. Respondents reported that longer, infrequent AARs were less effective.

Higher ranking and more experienced Soldiers see more value to the AAR. Individuals who consider themselves AAR experts also view the AAR as a more important aspect of training.

Question 1.1.1: How much of the ultimate training value of a training event comes from AARs (Less than 25%, 25-50%, 51-75%, More than 75%)?

The AAR provides less than 50% of the value in a training event, based on all respondent answers. More than 60% of respondents rated the AAR as providing half or less of the value in the training event. Only 23.2% felt the AAR provided 51-75% of the training value and only 10.1% believed the AAR provided more than 75%.

Question 1.1.2: In the training event, how important is the AAR compared to other aspects of the training event, such as mission rehearsal, informal feedback, or real time guidance (1-Less important, 3-Equally important, 5-More important)?

Overall, respondents indicated that the AAR is less valuable than other aspects of the training event ($M = 2.09$). Over 80% of respondents rated the AAR as 3 or less (3 = equally important) when compared to other aspects of the training event. However, there was a positive relationship between respondent's years in the Army and self-described proficiency and the value of the AAR compared to other aspects of training. This relationship indicates that individuals with more years of experience or a higher self-rated proficiency rated the AAR higher than respondents with fewer years of experience or a lower self-rated proficiency.

Question 1.1.3: How important is each of the following for reviewing team or organizational performance (1-No impact upon training event, 2-Minor contribution to training event, 3-Contributes to training event, 4-Strongly contributes to training event, 5-Vital to training event):

- Individual self reflection by the members of the team
- One to one discussion with an O/C or evaluator
- Frequent, short, informal AARs
- Less frequent longer and more formal AARs

Of the four methods presented for respondent review, frequent short informal AARs received the highest overall rating (average of 3.49). Rank and years of experience also had an effect on this question, with higher ranking Soldiers and those with more years of experience rating frequent, short, informal AARs higher than lower ranking Soldiers. However, one to one discussion and individual self-reflection also received average ratings over 3 (3.41 & 3.28 respectively), indicating respondents rated all of these methods as greater than "contributes to the training event" on average. Less frequent longer and more formal AARs received the lowest overall rating (2.65 average), indicating respondents tended to view this method as less desirable.

Table 4. *Summary of Responses to “How Important Are Each Of The Following For Reviewing Team or Organizational Performance”*

	N	Mean
Individual self reflection by the members of the team	775	3.28
One to one discussion with an O/C or evaluator	775	3.41
Frequent short informal AARs	775	3.49
Less frequent longer and more formal AARs	775	2.65
Valid N (listwise)	775	

Question 1.1.4: Of the previous four methods of reviewing team or organizational performance which do you think is the most effective (select one)?

- Individual self reflection by the members of the team
- One to one discussion with an O/C or evaluator
- Frequent, short, informal AARs
- Less frequent longer and more formal AARs

Of the four previous methods frequent, short, informal AARs are the most effective. Respondents selected shorter AARs as the most effective method over 50% of the time, with no other response being chosen more than 20% of the time. The large percentage of respondents who selected shorter AARs as the most effective of the four methods indicates the desire for less time consuming reviews by training audience members.

Question 1.1.5: What should be the atmosphere within an AAR (select one)?

- Serious
- Relaxed
- Entertaining
- Formal
- Casual

Respondents overwhelming opined that the atmosphere within the AAR should be relaxed (62.2%). No other answer was selected more than 22% of the time.

Sub-Issue 1.2: How do AAR practitioners prepare for training event AARs?

Respondents rated all preparation methods as important. Performance models—how other units have executed similar missions—are considered the most powerful tool for preparing AARs, with models from theater possessing the greatest legitimacy.

Question 1.2.1: How important is material from the following sources (1-Not important, 3-Important, 5-Very important):

- Field manuals and other doctrine
- Examples of how other units performed the same mission
- Examples of how the same mission is being performed in theater
- Personal examples by the AAR facilitator

Respondents indicated that the most important source for AAR material is examples of how the same mission has been performed by other units, especially how it has been performed in theater (average rating of 4.31). All sources were considered important, with no other response receiving an average rating above 3.6. Higher ranking Soldiers rated examples of how other units are performing the same mission higher than lower ranking Soldiers.

Issue 2: How are AARs considered during Execution Phase?

The respondent AAR participant sample perceived the AAR as a continuation of the interaction between the training facilitator and the training audience or leaders. They saw the role of the facilitator as being more participative than directive and believed that the AAR participants should have a key role in the direction and content of the AAR, which should serve as providing information to the training audience in terms of feedback. Respondents emphasized the importance of the experiences, professionalism, and preparation of the facilitator.

Sub-Issue 2.2: What are the AAR considerations during AAR preparation?

Respondents indicate that a large majority of Soldiers do not prepare for participation in an AAR, and of those who do there are no predictable patterns that can be leveraged by an AAR facilitator. This emphasizes the importance of pre-AAR preparation by the AAR facilitator as he or she is likely to be the only individual organizing thoughts and impressions from the training execution.

Respondents believed that, although not essential, it was important to incorporate material from all during-event reviews into the AAR, indicating their belief that the AAR is a continuation of an overall performance review paradigm.

Question 2.2.1: How do most Soldiers prepare for an AAR (select one)?

- Most Soldiers don't prepare for or think about the AAR
- Most Soldiers reflect on their individual performance to prepare to defend themselves
- Most Soldiers reflect on what other members of their unit did during training
- Most Soldiers think about lessons learned from the training session
- Most Soldiers reflect upon team performance to be prepared for the discussion in the AAR

Although a significant number (43%) of respondents reported that their fellow Soldiers do not prepare for participation in an AAR, the majority of respondents do believe Soldiers conduct some preparation for the AAR. Of the respondents who indicated that Soldiers do prepare for the AAR, they were evenly divided between the four available methods for preparing.

Question 2.2.2: In an AAR how important is it to include discussions and other reviews conducted prior to the AAR (1-Less important, 3-Important, 5-More important)?

Respondents indicated that it is important to include discussions and other during action reviews within an AAR, but not essential. Respondent answers fell into a nearly perfect bell curve for this question, with the highest and lowest possible answers having nearly the same percent selection (9.3% and 6.7% respectively), the middle answers having almost identical percent selection (2 = 18.5% and 4 = 21.2%) and the middle answer (3) receiving the highest percent selection (44.3%).

Sub-Issue 2.3: What are the considerations in presenting the AAR?

TC 25-20 states that the AAR is a “professional discussion”, a more participative or facilitative act. It also states that the AAR provides “feedback and insight” and is the “keystone of the evaluation process”, feedback and evaluation are more directive acts. Between these somewhat inconstant purposes, a small majority of respondents identified providing feedback as a purpose of the AAR, implying it should be the primary driver of the AAR presentation.

Respondents reported strong beliefs on the relationship of the facilitator to the training audience. Respondents indicated that it is important to very important to incorporate the opinions of the training audience within the AAR. Their opinion is that the facilitator is a partner to the training audience within the learning process, as opposed to serving in a more directive role where they represent the training audience’s chain of command. In regards to the provision of expertise, respondents hold that the primary source of expertise within the AAR is the training audience and that the central role of the facilitator is to help extract the tacit expertise of the audience.

To establish facilitator credibility, respondents reported that personal experience was the most important factor. Professionalism and doctrinal knowledge were also important. Rank and branch were less important. Personal experience is best established prior to the execution of the AAR, as is credibility in general. Within the AAR, it is important to display professional behavior and personal knowledge.

According to respondents, facilitators should plan for the AAR flow, but should be prepared to allow the training audience to vary from that plan when that variance contributes to overall training.

Question 2.3.1: Below are several possible uses for video, audio, pictures, graphics, etc within the AAR. Please indicate the value of video, audio, pictures, graphics etc for accomplishing each purpose (1-Not useful, 3-Somewhat useful, 5-Very useful):

- Providing a brief overview of the training event at the beginning of the AAR
- Demonstrating the actual performance of the training audience during portions of the training event
- Helping the training audience get back on track when discussing what occurred during the training event
- Demonstrating an exemplar way to complete the training event or a portion of it

Across the board, respondents stated that media were useful within the AAR, though the average usefulness score ranged between 3.49 and 3.75, slightly higher than “somewhat useful”. Of the four possible uses, helping the training audience get back on track was the highest rated response (3.75 average). The reported usefulness of media to help the training audience get back on track was even stronger among more experienced respondents. More experienced respondents also reported as significantly higher usefulness of media to provide an initial overview than did less experienced respondents.

Question 2.3.2: Which of the below statements is more accurate:

- Within an AAR, the facilitator has the expertise and should use that expertise for assessing and improving performance

- Within an AAR, the training audience possess the required expertise and should be encouraged and supported in using it

Respondents very strongly (76.3% to 23.7%) reported that, within an AAR, the training audience possesses the expertise required to understand and learn from the demonstrated performance. This respondent opinion reinforces the perspective that the primary role of the AAR facilitator is to, indeed, facilitate the discussion among the training audience.

Question 2.3.3: Which statement is more accurate:

- The purpose of the AAR is to provide feedback
- The purpose of the AAR is to conduct professional discussion
- The purpose of the AAR is to evaluate performance

Respondents were reasonably evenly divided over whether the purpose of the AAR is to provide feedback (43.7%), conduct professional discussion (26.1%), or evaluate performance (30.2%) ; the leading response was that the purpose of the AAR was to provide feedback. Providing feedback implies that the AAR leader, the facilitator, serves in as an expert and his/her role is more instructional or evaluative than it is facilitative. This belief is counter to earlier reported belief that the training audience vice the facilitator possesses the expertise requisite to the AAR.

Question 2.3.4: Which statement is more accurate:

- The AAR facilitator is the representative of the training unit's chain of command and works for that chain to help the training unit
- The AAR facilitator is a partner with the training unit's leader and works with the unit leader to achieve the unit's training

Respondents very strongly (68.5% to 31.5%) view the role of the facilitator is a partner to the training audience leader versus a representative of the training audience's chain of command. This result is in direct opposition to role implied in current AAR doctrine, which designates the O/C as a representative of the command.

Question 2.3.5: How important are the following factors in establishing the credibility of the facilitator (1-Less important, 3-important, 5-More important):

- Personal experience of the facilitator
- Rank of the facilitator
- Branch of the facilitator
- Professionalism of the facilitator
- Demonstrated doctrinal knowledge of the facilitator

Respondents reported that the professionalism was the most important factor (4.27 on a scale of 1 to 5) in establishing the credibility of the AAR facilitator, followed closely by the demonstrated doctrinal knowledge (3.94 on a scale of 1 to 5) and personal experiences (3.78). Branch and rank were not considered important (2.55 and 2.30 on a scale of 1 to 5, respectively). Higher ranking and more experienced respondents had a significantly higher opinion of rated demonstrated doctrinal knowledge higher than lower ranking or less experienced respondents.

Question 2.3.6: When conducting the AAR how important is it to incorporate the training audience member's perspectives 1-Less important, 3-Important, 5-More important)?

Respondent answers fell almost exclusively beyond the equally important rating (3) for this question. Respondents strongly believe that incorporating the perspectives of the training audience is important (97.8%) with a significant number believing it is very important (43.8%).

Sub-Issue 2.4: What are the AAR considerations in interacting with the training audience?

The related questionnaire asked respondents to assess a variety of potential facilitator AAR behaviors. The survey identified nine general behaviors, including the traditional facilitator behavior of asking open ended questions. All nine were rated as important. However, identifying what actually occurred within the training event, using examples or performance models from current operational theaters, using video to show unit actions, and ensuring there is open discussion were rated as the most important, in sequence.

Five behaviors were associated with encouraging group participation and four with controlling group discussion. For encouraging participation, asking follow-on questions was rated the most effective, higher than asking open-ended questions to individuals or the group in general, though these were also rated effective behaviors. Respondents rated directing individuals to comment on other participant's answers and remaining silent to cause group comment as less effective.

Respondents indicated a perceived importance of allowing the training audience a level of control over the length and content of discussion within the AAR. Respondents believe the facilitator should occasionally let the training audience discussions vary from his plan. This was also reflected in the respondents' answer to what behaviors facilitators should exhibit when the training audience was talking, they strongly supported some involvement but were evenly divided between some correction of training audience input and the a more directed approach of adding to the training audience input.

Question 2.4.1: When the training audience is providing input such as when they are providing sustain and improve comments what is the role of the facilitator (select one)?

- The facilitator should remain quiet and let the training audience discuss the issue among themselves
- The facilitator should provide some guidance if the training audience is incorrect in their input
- The facilitator should be involved in the input and adding to what the training audience says
- The facilitator should comment on every piece of input from the training audience

Respondents believed that the facilitator should engage in some level of active involvement in training audience discussions while remaining separate from that discussion. Very few respondents believed in the upper or lower level description of various facilitator participation strategies, remaining quiet (13.8%) or actively engaged in the discussion through aggressive engagement (4.3%). Respondents' selection was close to evenly split between facilitators providing some guidance to the training audience (40.4%) and facilitators being involved in the input and adding to what the training audience says (41.6%).

Question 2.4.2: How useful are each of the following actions for helping organizations benefit from the AAR (1-Not useful, 3-Somewhat useful, 5-Very useful)?

- The facilitator asks open ended questions
- There is open discussion amongst the training audience
- The facilitator encourages AAR participation by calling on specific individuals
- The facilitator refers to published doctrine i.e. FMs, CALL bulletins, etc.
- The facilitator coaches or mentors the training audience
- The facilitator identifies what actually occurred in a training event, i.e. ground truth
- The facilitator uses video or audio to show actual unit performance
- The facilitator shows examples of how other units executed the training mission
- The facilitator uses examples from in theater Iraq or Afghanistan

All of the provided facilitator behaviors were reported by respondents as being more than somewhat useful. The most useful behaviors were using identifying what actually occurred within the training event (4.30), using examples from active theaters of operations (4.25), using video or audio to show actual unit performance (3.97), and ensuring there is open discussion amongst the training audience (3.93).

Question 2.4.3: How effective are the following techniques for encouraging group participation (1-Not effective, 2-Partially effective, 5-Very Effective):

- Direct open ended questions to individuals
- Direct individuals to comment on other individuals answers
- Direct open ended questions to the group
- Ask follow on questions
- Remaining silent after asking a question until the group comments

Of the potential methods for encouraging group participation, respondents reported asking follow-on questions as the most effective (4.13). Further, asking follow-on questions was rated very effective by the largest number of respondents (39.1%). Asking open ended questions to individuals and to the group were reported as being partially effective (3.64 and 3.63, respectively). Directing individuals to comment on another's answer and using silence to cause group comments were rated as less than effective (2.91 and 2.62, respectively).

Question 2.4.4: What is the most effective strategy for directing the training audience discussion during the AAR (select one)?

- Let the training audience completely drive the discussion
- Occasionally let the training audience vary if the discussion is productive
- Try to keep the training audience on your planned discussion path
- Never let the training audience vary

Half (50.1%) of the respondents reported that occasionally letting the training audience vary from planned discussion was the most effective strategy for directing discussion during an AAR. Generally, respondents rejected letting the training audience completely drive discussion (10.4%) and never letting the training audience vary (4.2%). One third (34.7%) of respondents supported a more aggressive effort by facilitators to control the AAR discussion. The bottom line is that respondents (95.8%) do not believe in a highly controlled AAR experience.

Discussion

AAR doctrine describes a discrete event that occurs after some amount of significant training has been completed. This doctrine describes the AAR as if it were something that occurs external to the training. Our examination of AAR, on the contrary, shows that common practice and Soldier attitudes reflect a full assimilation of the AAR within and as a key part of the training.

Common Practice

The AAR has become one element of the overall interaction between the trainer (and training system) and the training audience. Its boundaries within that interaction have been open to individual interpretation. This has raised disagreement between AAR purists who want to stay with the original interpretation of the AAR and practitioners who loosely use the term “AAR” both as noun and verb to describe any performance review. For the most part, this report uses “AAR” in its doctrinal sense as an organized and facilitated group review/discussion following a significant training activity. We used other common terms, such as “hot wash”, to describe other performance review efforts and further propose that the Army should increase use of the term DAR to capture these interim review events that do not fully meet the doctrinal definition of an AAR.

The AAR is a multi-disciplinary activity drawing from a number of the human sciences. Traditionally, AARs have been associated with learning sciences. Learning sciences remain integral to the AAR but the attitudes and practices of AAR practitioners show that the AAR is also quite dependent on other cognitively-oriented fields of expertise such as knowledge management and leadership.

A key observation from this research is the importance of AAR acceptance by members of the training audience. A majority of the O/C effort is targeted towards achieving this acceptance, including a de-emphasis of the number focus areas and an emphasis on O/C credibility, peer relationships, acceptable ground truth, participation, and free discussion. O/Cs adjust their verbal and non-verbal communication patterns to foster participation and acceptance. This could in part be because O/Cs are external to the training group. They have no formal authority over that group during training and no authority after training is complete.

O/Cs, who believe they have the ability to help a unit improve, and want to help a unit preparing to deploy to a theater of operations, must use persuasion and example to influence group behaviors. O/Cs usually, as a result of their own experience, have sufficient expertise that they will be successful in using persuasion and example in an effective manner. Many of the processes they use rely upon subtlety, such as passively or indirectly citing their own experience and knowledge credentials, or their ability to use silence to foster response.

The second key observation is the emphasis placed on DAR or hot washes, relative to the AAR. One O/C opined that hot washes were actually more critical to training success than AARs. This could be due to several factors. The Situation Training Exercise (STX) lends itself to the use of frequent, simple, and relatively easy-to-develop hot washes. Such reviews also develop stronger partnerships between the trainer and the training audience than a more formal AAR structure. The potential issue with these reviews is the inability to draw on data that establish “ground truth”, and instead assume “ground truth” based on information readily available at the time, which is often incomplete or incorrect. Therefore, learning may be flawed

because it becomes based on incomplete assumptions or incorrect information about what actually occurred.

The third point of interest from these interviews is the change in relationships found within the AAR. Figure 2 depicts the traditional AAR relationship, as described in the limited AAR doctrine. It is a relationship between the facilitator (fa) and the training audience (ta) and where the facilitator is implied to be an extension of the training audience's superior. In this relationship, the facilitator or O/C leads the AAR (FM7-1, 2003).

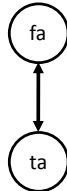


Figure 2. Traditional AAR participant relationship.

The NTC O/Cs interviewed describe a different relationship. In this relationship, as depicted in Figure 3, the facilitator is partnered with their counterpart (cp) in supporting the training audience's learning.

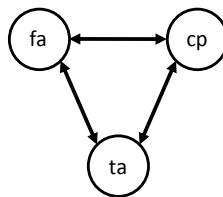


Figure 3. Reported NTC AAR participant relationship.

BCTP O/Cs must deal with an additional participant, the senior mentor (figure 4). The senior mentor is not accounted for in AAR doctrine. He is normally a retired senior officer. In situations where the counterpart significantly outranks the facilitator, a senior mentor adds the credibility necessary to achieve an effective AAR. However, the senior mentor complicates facilitator-counterpart-audience relationship. From our observations of the role of senior mentors (sm) during this investigation, it appears that he/she fills the position doctrines describes for the traditional O/C, someone positioned over the training audience including the counterpart leadership.

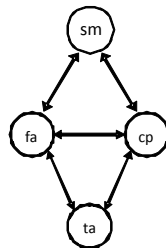


Figure 4. Senior mentors relationship to training audience.

The fourth observation is that preparing the AAR is a knowledge management challenge. The NTC provides a robust instrumentation system that offers a wealth of data. The individual O/Cs generates an abundance of data through personal observations. Added to this is the data

obtained through coordination with other O/Cs. Additional data is gained through counterpart and training audience interactions, especially from hot washes. Finally, critical data, including operational models or “a-ways”, is incorporated using sources outside the training event. These include previous training, authoritative sources, such as the CALL, and reports on or O/C experiences conducting in-theater operations.

In the relatively short time from the end of a training exercise to the start of an AAR, the O/C has to review all of this data to clarify his own understanding of what occurred and why. He has to filter and organize the data and then prepare to present it in the AAR. To foster training audience ownership during discussions, the O/C must neither control them completely nor force a linear progression on those discussions. Therefore, the O/C needs easy access to all relevant the data. In the austere field environments where a majority of AARs are conducted, achieving this is even more difficult.

The final observation is the linkage between effective facilitation and basic leadership. FM 6-22, Army Leadership (2006) identifies a leadership model with attributes—what an Army leader is, and core leader competencies—what an Army leader does. These are similar to the attributes and competencies which interviewees expressed when they described working with counterparts and training audiences.

Table 5. *Leadership Requirements Model*

Leadership Requirements Model	
Attributes-What an Army Leader is	Core Leader Competencies-What an Army Leader does
A Leader of Character Army Values Empathy Warrior Ethos	Leads Leads Others Extends influence beyond the chain of command Leads by example Communicates
A Leader with Presence Military bearing Physically fit Composed, confident Resilient	Develops Creates a positive environment Prepares self Develops others
A Leader with Intellectual Capacity Mental agility Sound judgment Innovation Interpersonal tact Domain knowledge	Achieves Gets results

Generally, the model was supported by our observations. Observed behaviors of facilitators and group members within AAR sessions represented a considerable variety of constructivist activities. It was clear to the research team that observed behaviors reflected many of the specific constructs within the ITAAR model (learning, performance appraisal, feedback, and knowledge.) More importantly, it was evident that the interpersonal dynamics we observed reflected the process oriented transitional steps between model components. For example, AAR facilitators spent considerable energy to specify goals and to revise or update criteria as discussions ensued. We also noted that AAR participants were generally engaged in mental model assimilation as they incorporated the feedback received from other participants, command personnel, and facilitators. Hypothesized supporting constructs were useful for discriminating between positive and negative behaviors of facilitators and groups.

One test of an adequate research model is the sensitivity of its constructs. Our team was very interested in whether facilitators and group members would vary with regard to the constructs represented within the ITAAR model. Our observations confirmed the power of the model. Specifically, we observed in several cases that facilitators refined their appraisal content in real time based on reactions of the Soldiers and groups during the AARs. We also noted significant efforts by facilitators to ensure that group members achieved shared mental models.

Table 6. *Cognitive Research Areas That Contribute to Constructs Within the ITAAR Model*

Research Area	Relevant ITAAR Construct	Citation(s)
Instructional Technology	Feedback, Knowledge	Baird, Holland, & Deacon (1999); Briggs (1977)
Human Learning	Knowledge	Garvin (2000); Bilodeau (1966); Atkinson & Shiffrin (1968)
Task Training	Knowledge, Feedback, Performance Appraisals	Holding (1965); Patrick (1992); Goldstein & Ford (1992)
Team Performance	Knowledge, Feedback, Goals	Minionis, Zaccaro, & Perez (1995); McIntyre & Salas (1995)
Leadership	Performance Appraisals	Hoyt, Halverson, Murphy & Watson (2003)
Knowledge Management	Knowledge, Goals	Nonaka & Takeuchi (1995); Joshi, K.D., Sarker, S., & Sarker, S. (2007)

In cases where AARs were less successful, the observed weaknesses were directly related to specific model constructs: flaws in shared knowledge, failure to assimilate feedback into existing mental models, and failure to engage in post-training discussions. To elaborate, one of the pervasive problems we noted was the failure of AAR participants to spontaneously engage in dialog. Such dialog is a central part of the ITAAR model, linking knowledge to feedback. Conversely, some of the more effective AAR sessions featured data that were related to performance assessment criteria and goal monitoring.

Proposed important constructs successfully discriminated between activities of facilitators (e.g., high on leadership) and group members (e.g., high on team activity). During the AAR sessions we observed, a critical aspect was the balance between facilitator and group expression. The most effective AARs were those where facilitators comfortably relinquished control of the session to group members, so that they could discover their own insights. For their own part, effective group members were eager to talk to each other, not relying on the facilitator as a go-between for shared information. The ITAAR model represents this difference well using the constructs of feedback and goals. The transition step from “Feedback” to “Goals” (Enables Self-Goal Monitoring) was intended for this purpose. Additionally, the transition from the Performance Appraisals” to “Knowledge” constructs reflects the importance of achieving shared mental models; such achievement is possible only through mutual group member exchange.

The importance of proposed constructs was confirmed based on the observed behaviors of facilitators and group members. As noted above, the exchange between facilitators and group members was a key focus for our observations. We noted that there were many occasions where

the facilitators' knowledge of the battle tempo, dynamics, and resources added to the SA of team members. Such information exchange is reflected directly by the ITAAR model linkage that states, "Knowledge of task facilitates goal setting; goals structure the knowledge dispersement process."

Body of Knowledge

Support for training leaders on the AAR. Although one can argue that the Army's use of AAR techniques dates back several decades, the seminal description of the modern AAR is found in the 1993 TC 25-20, A Leader's Guide to After-Action Reviews. This training circular, which has never been updated, provides a comprehensive discussion of the processes and techniques one should employ when planning, preparing, conducting, and using the results of the AAR. This document serves as the key reference and touch point for the various Army doctrinal manuals that address the AAR, such as, FM 7-0, Training for Full Spectrum Operations (DA, 2008) and FM 7-1, Battle Focused Training (DA, 2003). However, providing leaders and trainers with doctrinal manuals and training circulars that describe the AAR process does not teach leaders or trainers to effectively conduct AARs.

When one explores the extent to which the AAR is addressed as a specific learning objective in the Army professional education system, it appears to be infrequently considered. This team reviewed the Programs of Instruction (POI) for officers, NCOs and enlisted personnel in both the Field Artillery (FA) and the Air Defense Artillery (ADA) schools. The AAR, as a specified learning objective, could only be found in a small number of officer and NCO courses at the ADA school. In some of these cases the intended context for this AAR instruction was strictly the conduct of an AAR of that course and not training how to conduct an AAR for future employment during unit training or operations. Instances of the AAR as a learning objective were not found in any of the FA POIs.

Salter and Klein (2007) discuss the inclusion of the AAR as a key learning objective in the Warrior Leaders Course (WLC) produced by the U.S. Army Sergeants Major Academy (USASMA). This is a two hour block of instruction that includes a 45 minute practical exercise. The practical exercise is driven by a paper-based vignette and provides the opportunity for each student to develop their AAR materials and then participate in a class discussion of the results. This practical exercise does not afford the time required for each student to practice the conduct of their intended AAR, only to share information on their intended approach. The POI for the WLC was recently updated but our team could not obtain a copy of the new curriculum so we do not know if the two hour block of instruction on AAR was included in the updated POI or modified.

The POIs at the O/C Academies run by the CTCs include a significant module of instruction on the AAR. By example, the O/C Academy Training at the JRTC is a three day course that reviews all of the material an O/C needs to know to work at JRTC. Its POI emphasizes key portions of the O/C Handbook. Within this POI is a block of instruction focused on the AAR that covers the key components of TC 25-20 within the context of training operations at the JRTC. This includes AAR planning, preparations, and formats. The class provides the JRTC AAR format and example focus area slides (e.g., rehearsals, priorities of work), as well as slides for specific focus items (e.g., command and control; force protection). The training repeats the admonishment found in most doctrinal manuals not to turn the AAR into a lecture or critique. They note that a critique provides only one side of an activity and tends to

focus on what went wrong rather than on the training event as a whole. As noted by all others and repeated in the O/C train up class, the lecture format reduces open discussion and usually fosters neither team building nor unit cohesion (Salter and Klein, 2007). What the O/C Academy POIs do not include are practical exercises that provide the opportunity for guided practice in the execution of the AAR. Such a practicum would serve to internalize the adult learning tactics and techniques described in the PowerPoint-based courseware. According to Salter and Klein the training support materials employed in this POI do not even include exemplar videos that provide a good view of what “right” looks like. This lack of in-class opportunity for students to practice and perfect their skills in conducting AARs means that even O/Cs at the CTCs must learn via on the job training. There is no assurance that what the O/Cs learn from their practical experience is consistent with the core principles of effective AAR or is consistently applied across the team of O/Cs.

The core Soldier and leader development POIs not only rarely include instruction in the fundamentals of the AAR, they also do not cover adult learning theory or provide guided instruction and practical exercises where one might develop AAR skills. In effect, the only sources available for all leaders and trainers to learn the core concepts, general methods, and even tips to help ensure the conduct of an effective AAR are Army doctrine manuals. This fact reinforces the notion that AAR conduct is now a skill that is usually learned in the way of an apprentice. Instead of leaders and trainers undergoing a consistent AAR learning experience that is reinforced as they progress up through the levels of professional development and schools, AAR skills come from on the job experience based on observing others conducting AARs and from being the recipient of “AARs.”

This approach, assuming leaders understand and can conduct effective AARs, is of concern when one looks closely at the doctrine. FM 7-1, and other doctrinal manuals, state “Commanders are responsible for training O/Cs to include training on how to conduct an AAR.” If the commanders have not been formally trained on the AAR process and the art of conducting effective AARs, then we should not assume that they can effectively train others how to conduct AARs. Someone technically and tactically knowledgeable of the appropriate TTPs can create and lead a training critique using a standard AAR format. However, the art of facilitating an introspective AAR, where a unit identifies areas for improvement and collaborates to develop a plan for corrective action, requires guided training and practice; it is a complex skill that must be learned. The techniques to conduct such an AAR and, even more so, understanding the underlying cognitive and learning process, must be explicitly taught to Army leaders.

Future research. In addition to the practice recommendations above, we have identified a number of issues and areas where future behavioral and organizational research relative to the AAR is warranted. Several of these agenda items relate to the various theoretical foundation areas within the ITAAR model.

One topic that needs to be investigated is the status discrepancy within groups attending AARs. There appear to be frequent variations in organizational status among participants in traditional industry AARs. In military training, the status difference is clearly highlighted by the traditional chain of command and indicators of rank or position (insignia, audience deference). In our observations, we observed that status discrepancies influenced the free flow of information and restricted audience remarks; suggestions were frequently routed through the battalion commander or the facilitator instead of being directed to other participants. Social

identity is acknowledged as an influencer of learning (c.f., Child & Rodrigues, 2006), therefore it seems important to explore the impact of social identity within the feedback process of the AAR.

A second area we recommend for future research is investigating the impact of specific technology tools on learning and retention. During the AAR sessions we observed, facilitators used certain technology to support their presentation. However, it often appears that the use of technology was tangential to the goal of providing specific, quality training performance feedback. In some cases, video material was shown to increase morale or to impart humor; however, its relevance to what was discussed during the AAR was unclear. In other cases, facilitators relied on PowerPoint slides or documents to portray “ground truth” data. This tactic generally seemed effective, provided the facilitator could emphasize those points in time where the media content was directly relevant to teaching points. Over the last 15 years, researchers have increasingly debated the benefits of using technology in the classroom (c.f., Cradler, McNabb, Freeman, & Burchett, 2002). There is usually limited time to conduct AARs (this was frequently noted by trainees during our observations), therefore it is important to optimally use the time available. We recommend research to investigate the best use of technology during AAR sessions.

The third issue we believe is appropriate for further involves comparing group dynamics during the training session with those apparent during the AAR session. There were notable differences among groups during the observed AARs. These differences were due to numerous factors; however, a strong influence on AAR success was the group’s cohesiveness. More effective groups clearly possessed a collective passion and commitment to improvement. They did not appear to require significant direction or control from the facilitator during the AAR. In contrast, some observed groups, which were less cohesive, required significant direction from the facilitator during the AAR. These types of group dynamics often reflect the presence of group member traits (as opposed to states). If this is true, it may be worthwhile to determine whether attitudes and predispositions can be determined during training, then used to tailor AAR sessions to improve their outcomes. This idea is supported by researchers, such as Anderson and Martin (2002), who suggest that group communication skills may be reflected across situations.

Deployment. We have alluded several times in the previous discussions to the need to teach Army leaders (and other services for that matter) the fundamental theoretical principles underlying an AAR. An analogy is teacher education, in which students in training to be teachers are taught not only the subject(s) they are planning to teach, but also methods of instruction, principles of learning, and concepts of cognition. Because nearly all Army leaders in the NCO and Officer ranks will sooner or later be called upon to lead AARs, there is a need for them to clearly understand the rationale behind that process. The ITAAR model could be used as a basis for teaching the key fundamentals that leaders will be expected to understand and leverage in facilitating an AAR. While teaching the model per se may be more complex and effort-intensive than the value derived from comprehending it warrants, the key elements captured in the model (Figure 1) should be used as the basis for curriculum used in professional education resident as well as in on-line courses suitable for distance learning.

Recommendations

Recommendations for the Practice of AAR

The AARs we monitored were generally effective. Given the complexity of the tasks performed, the heterogeneous nature of the groups evaluated, and the compressed time available for each review, facilitators were notably efficient as they organized the AAR sessions. Groups, too, were dedicated and responsive. There are several suggestions that, if implemented, could enhance the process and produce better learning.

First, we observed that many of the physical environments used were not well suited for group interaction. Group members were often seated in rows, which discouraged them from lengthy or face-to-face interactions. Repositioning the furniture so that group members face each other (such as in a circle) could enhance interaction, collaboration, and discussion. Another observation is that facilitators often used videos which bore marginal relevance to the content of the AARs themselves. It almost appears that they feel compelled to incorporate the videos merely because the technology allows them to do that. We also recommend providing the AAR facilitators with Smartboards to record notes, present ideas, or organize suggestions for individual or collective improvement. Doing so would allow ready conversion of notes to electronic format, thereby ensuring that a record is maintained for future use.

The presence of the facilitator, though beneficial for record keeping and direction, at times appeared to stifle free exchange of information among group members. It may be beneficial to have the facilitator participate remotely, so that group members perceive less scrutiny during social interchanges.

Another suggestion might be to strategically locate, within the room, those group members who hold position power (French & Raven, 1959), to encourage social exchanges to flow through them. The importance of physical seating arrangement has been noted in a number of therapy environments where exchange of information is a critical part of the learning and growth process (Steinzor, 1950).

ISD Implications for Training/Education System Development

We learned that formal “Conduct of AAR” training is not included in most Army POIs and that this skill is one most often “learned” via apprenticeship-style training. In essence, the techniques employed are the techniques the apprentice has seen employed. Not always, but often, AARs turn into unilateral briefs or critiques governed by the norms of the unit’s hierarchical chain of command rather than collaborative feedback sessions that assist the training audience achieve their learning objectives.

Because the theoretical methodology for conducting an effective AAR often diverges from standard military practice and SOPs, we recommend including that topic in POIs for all trainers, facilitators, observers, and Army leaders in general. Explicitly pointing out how an AAR is different from other types of briefs, relating the benefits of a successful AAR, and creating a live practice environment where AAR skills can be practiced are all topics that should be included in POI courseware. For a suggested curriculum for “Conduct of AAR” training, see Appendix A.

Community of Interest

The results of our research have led us to consider the wider theoretical and practical issues that drive the military AAR process. We recognize that there is a substantial community of scientists and practitioners interested in the AAR process, and committed to its effective implementation in the field. Our research has enabled us to communicate with such individuals, and to take initial steps toward the organization of a AAR community of interest (COI). That community would include members from academia, industry, and the military who share common goals: to insure AARs are a key event for enabling the training audience to benefit from a review of training; exploitation of appropriate technology and techniques; enhancements to training environments to better support AARs; and encouraging the commitment of trainers to apply effective AAR approaches both in the field and in classrooms.

Based on these goals, we recommend the following activities be initiated which will be both supported by and central to instantiating a COI:

1. There is a need for a funding program which will support and integrate a multidisciplinary approach (training, human factors, military, industrial psychology, education, others) to research. After examining theoretical and applied work accomplished by a variety of individuals and institutions studying the AAR process, we observed that most work has been accomplished in an *ad hoc* manner at the initiative of organizations conducting or sponsoring the research. It is common for the agenda of researchers to be driven by the availability of research funding and perceived needs of sponsoring organizations. Therefore, comprehensive, multi-year programs of research devoted to focus on areas such as AAR practice are unusual. We recommend that the Army (or an OSD level research organization) commit to a dedicated research program on AAR theory and practice over multiple years. A model for this approach is the Virtual Technology and Environments (VIRTE) program (sponsored by the Office of Naval Research). TRADOC should be a strong proponent for research to gain understanding of the AAR and improving its practice. They should take the lead in promoting research initiatives, organizing conferences and workshops for practitioners and researchers alike, and establishing forums for information exchange.
2. A collaborative research effort designed to compare and contrast AAR theory and application across varied domain areas is needed to replace what today are largely efforts stove-piped by domain area. For example, there are researchers who have devoted effort to understanding the AAR process within the firefighting community, those who have studied AAR use in educational institutions, those who have studied AAR for particular industries, and those who have focused their research within a military context. However, we discovered that there are significant lessons to learn from researchers who are working in other (seemingly unrelated) application domains. We recommend that funding sponsors leverage the opportunity for cross-fertilization and establish multidisciplinary grants that encourage the cross-pollination of research ideas and theories. Such an effort could help to further validate theoretical foundations such as the ITAAR model.
3. Longitudinal research that investigates the AAR process from start to finish should be funded. During this research we observed that most intellectual effort in terms of the AAR has concentrated on the conduct of formal AAR sessions. However, the AAR

process as practiced within the military is much more complex. Military units are accustomed to instituting informal hotwashes or review sessions where the focus is on individual and small group tactics, informal AARs where the focus is on the performance of a small team, large AARs where integration of teams is the focus (e.g., company level), and very large AARs where integration, communication, and role assignment is of interest within large or across commands. A comprehensive research program should focus on not just one or two levels of AARs, but on the integration and progression of lessons learned for an entire training event at multiple levels of command.

4. Develop a set of standards to optimize the physical environments within which AARs are implemented. Because there are a variety of application domains for AARs there are diverse types of physical environments within which AARs are delivered. We observed that the use of technology and physical space impact the degree with which participation and communication occurs during the AAR. This impact is often amplified within the military because of the potential influence of the formal chain of command relationships within the training audience. Though Soldiers are encouraged to speak freely, we observed a free and open exchange was often not attained. We recommend a study be conducted with an end goal of recommendations for how to best configure physical spaces to accommodate the AAR process. We recommend that these guidelines be based upon principles and research findings relevant to learning found in the social and educational literature.
5. Training support material should be developed in the form of a text or reference book to aid AAR practitioners in the field and suitable for use within educational programs that teach AAR theory and practice. Such a book may be forthcoming from an independent author or team, but if not then it should be promoted or even sponsored by the Army.
6. The advent of the use of game-based, multi-player environments or virtual worlds to support training is also a key research area that must be addressed in the context of how to best conduct an AAR to support this training genre. Game-based technology allows for a distributed training audience and in-world interaction that correlates with live training of teams or groups. The issues that need investigation involve how and where one conducts an AAR of these in-world events. If it is virtually (i.e., in world), which appears to make the most sense, then researchers need to identify which of the theoretical foundations we have captured in the ITAAR model apply and how to best support the elements of that model in a virtual setting.

Summary and Conclusions

The AAR has developed into a key feature of the Army's training approach. It is being conducted in various fashions throughout the Army, primarily as facilitator-led efforts to support self evaluation within a team or unit. Solid techniques have been developed, key research conducted, and canonical practice within some organizations established. An opportunity exists to leverage what has essentially been grass roots research and principles of practice developed somewhat independently by a variety of organizations. We can combine those efforts and juxtapose them with the research results on theoretical foundations from this research. The objective would be to establish a common basis for understanding what an AAR should accomplish together with a recommended set of principles to guide practice. That body of

knowledge would support training Army leaders to serve as facilitators of AAR events and guide future development of doctrine and supporting AAR technology and systems. We recommend that the ITAAR model be promulgated together with an explanation and include recommendations of additional references in the key theoretical areas for use by those interested in AAR at the conceptual and theoretical levels, as well those who do or will teach AAR practitioners. A reference note or training guide on the ITAR model with this type of content would be appropriate. There is also a need for a more extensive reference book on AAR that could be used in future research and to guide curriculum development (for teaching AAR) but such a tome should be pursued by authors on their own without specific government funding and marketed commercially not just to the military but to other government agencies and industry. The AAR has been and will continue to be a key force multiplier in optimizing the value attained in training. It is a fiscally economical way to derive additional benefit from investment in training events and technology. In this ensuing era of limited resources available to the defense community we need to insure the use of AAR and the support to do it properly (Observer Controllers, Senior Mentors, replay and review technology, etc.) are not impacted by budgetary reductions. And the training community and those with an AAR Community of Interest need to promote its use even more strongly as a cost effective way to derive added value from training already funded and planned.

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APPENDIX A: Suggested Curriculum for “Conduct of AAR” Training

Standard curriculum. Effective instruction should as much as possible mimic the conditions under which the skills will be performed. A constructivist instructional design is appropriate for maximizing the replication of effectively facilitating an AAR. A constructivist instructional design should include the following:

1. Anchor the learning activities by sharing the larger learning objective with participants. This would include showing examples of the effective conduct of an AAR as well as providing context or background information on why an AAR is important in the bigger picture. This might be particularly important since the instructional methods and outcomes may be foreign to many participants.
2. Encourage ownership of the overall problem by eliciting learner accounts of previous AAR experiences. Another possibility would be to open with an example of a poorly conducted AAR and ask for comments. Selecting one of these activities will help learners adopt the problem as their own.
3. Build in the course authentic tasks that provide the opportunity to conduct an AAR. Fabricated or contrived tasks do not represent the same type of cognitive challenges would not require the same learner buy-in or level of performance that would be faced in live performance.
4. Created multi-faceted authentic opportunities to conduct an AAR. Rehearsals that replicate the conditions under which the skill must be performed clearly increase the transfer of the skills to the workplace. For example, conducting an AAR with a group of students may be very different than conducting an AAR with officers.
5. Allow participants to own the problem-solving process. When presented with a challenge faced in a particular AAR, a specific approach or methodology should not be dictated by the curriculum; learners should be challenged to use their own methods to devise a solution. Of course the outcome of any solution should be compared to AAR best practices and guidelines before.
6. Use an open inquiry techniques to value as well as challenge the learner’s thinking. This is both an instructional technique as well as a learning objective. This concept means that learners would understand how to craft questions that stay on the leading edge of participant thinking, rather than directing them to a particular goal.
7. Use collaborative learning groups to broaden learning to accommodate the social environment. For example, as learners construct a mental model about how to facilitate an AAR, discussing this model in groups helps to crystallize and refine the level of understanding and depth of the model.
8. Provide opportunity for reflection in the AAR curriculum. Reflection is often overlooked as optional in courses designed for a military audience. Research shows that the inclusion of processing time deepens the understanding of where new learning fits in the broader context of experience. Additionally, it mirrors the recommended AAR process. When AAR facilitators learn to think reflectively, AAR participants will be more likely to do so as well.

Taking the above suggestions and formulating a curriculum might look something like the following:

Terminal Learning Objective (TLO):

AAR Facilitators will be able to conduct a variety of facilitation activities including and/or specializing in the conduct of After Action Reviews, incorporating the best practices as defined by appropriate doctrine and principles of facilitation; ultimately guiding participants through a session that enhances their ability to learn from experience.

Enabling learning objectives (ELO):

Students will be able to:

- Understand the potential value of an AAR
- Apply the principles of effective AARs from the cognitive science domain
- Define facilitation
- Understand how facilitation differs from other team functions, such as leadership
- Understand the principles of facilitation
- Effectively facilitate a meeting of peers
- Create a plan for data gathering and conduct of an AAR
- Prepare to facilitate an AAR
- Select and isolate specific events that are significant to the AAR group in terms of learning from experience
- Operate a variety of technologies to expertly enhance the effectiveness of AAR operation'
- Successfully rehearse and AAR
- Display information cogently to allow the AAR group to draw accurate conclusions
- Conduct an effective AAR
- Critique an effective and ineffective AAR
- Employ best practices to close or wrap up an AAR session

Exemplar Curriculum:

- I. Introduction
 - a. Video of an expertly conducted AAR
 - b. Discussion of participant experience with AARs
 - c. Provide an overview of the AAR process and goals – with more detail to be delivered in subsequent lessons
 - d. **Formative Activity:** on a class wiki, students will create a page where they will begin a discussion regarding the definition of inquiry learning and how it applies to conducting an AAR.
 - e. **Formative Activity:** students will create individual blogs regarding their experiences with AARs. The first entry will be a summary of the above discussion.
 - f. Presentation of terminal learning objectives and purpose/importance of the AAR process

II. Theoretical context for AAR organizing principles

- a. **Formative Activity:** from a pre-selected book list, each student will select a book to read and review, outlining the 3 or 4 key points of the book. The review will be posted on the class wiki.
- b. Behavioral driven AAR research of best practices
 - i. Long term memory storage
 - ii. Situational Awareness
 - iii. Team dynamics
 - iv. Communication
 - v. Goal setting and communication
- c. Design related best practices: development of task mastery
- d. The nature and effectiveness of feedback mechanisms
- e. **Formative Activity** – students will conduct their own AAR research and create a blog entry that adds more detail/depth to at least one of the theoretical contexts presented above

III. Facilitation; the context for Conducting an AAR

- a. **Formative Activity:** Assign the class the task of organizing a panel of experts to speak about the AAR process, the instructor should expertly **facilitate** the panel of experts
- b. Debrief the task by conducting a formal AAR on the organization of the event
- c. Conduct a “meta” AAR (or an AAR on the AAR)
- d. **Formative Activity:** students will create a blog post on what they noticed about the role of facilitator
- e. Define facilitation and derive the elements of facilitation from the previous activity
- f. Define a broad range of possible methodologies and processes related to facilitation, noting when each is likely to be most useful
- g. Present background and research on facilitation and its benefits

IV. Planning for an AAR

- a. Present the goals of the planning phase for an AAR
- b. 15 minute multimedia presentation on planning an AAR, highlighting the exercise with video clips of a planning session
- c. **Formative Activity:** Introduce a field trip to witness a military exercise/activity and view an AAR. Before the trip, but with details of the exercise, conduct a planning session for the AAR of the exercise. [Compare the classroom plan to the plan used by the AAR facilitator]
- d. **Formative Activity:** Ask students to work in teams of two to create a planning template and post on the class wiki
- e. **Summative activity:** Ask students to find an event in the future in their place of work for which they can conduct an AAR and create a plan.

V. Preparing for an AAR

- a. Present the goals of the prepare phase of the AAR

- b. 15 minute multimedia presentation on preparing for an AAR – emphasizing the art of formulating questions
- c. **Formative Activity:** Add more detail about the AAR trip and outline “Prepare” tasks in relationship to the actual AAR event. [Attend the event] Compare the classroom preparation tasks to those of the expert AAR facilitator. Ask students to record the questions asked and facilitation methods used during the AAR
- d. **Summative activity:** Create an outline for preparing for the work AAR.

VI. AAR Rehearsal

- a. Present the goals of the rehearsal phase of AARs
- b. Introduce and use the technologies associated with AARs
- c. 10 minute presentation on the elements of an AAR rehearsal
- d. **Formative Activity:** as a class develop a list of possible unexpected events and ask the students to devise strategies to overcome or work around the interruptions
- e. **Summative activity:** Ask students to rehearse their upcoming AAR in teams of 4. Allow students to coach on-another during the rehearsal Complete several iterations, with a different interruption each time.

VII. Conducting an AAR

- a. Deliver a 15 minute presentation on preparing for an AAR
- b. Show a video of a poorly conducted AAR and an expertly conducted AAR
- c. Compare and contrast the field trip experience what has been learned in the classroom to date.
- d. **Formative Activity:** ask students to
- e. Develop a list of best practices during class discussion and post the results on the wiki

VIII. Closing an AAR

- a. 15 minute presentation on wrapping up an AAR
- b. **Formative Activity:** Have students practice wrapping up an AAR by showing a video of an expert AAR, but stop just before the closing and have students supply the ending.
- c. **Formative Activity:** Students will create a blog post regarding how they expect to close their upcoming AAR debut.
- d. **Summative activity:** Ask students to execute their work AAR and have the participants complete a survey upon completion. Analyze the results of the survey

APPENDIX B: AARs in Practice

Planning

Facilitators review unit training objectives and other pertinent information such as past unit training assessments and performance, unit composition including equipment, and personnel shortages. Facilitators review the training event schedule. They identify time and other resource availabilities as well as identifying the best time to conduct formal and informal AARs. AARs are conducted when there is time available within the training event to prepare and conduct the AAR, when the break from training will not significantly disrupt training, and when there are sufficient training results. Formal AARs consume larger amounts of preparation and execution time and are significantly more disruptive. Informal AARs consume less time. Other types of performance reviews, i.e. During Action Reviews (DARs), also called hot washes, Green Book AARs, hood top AARs, etc., require the least amount of time and are least disruptive. Facilitators use DARs for reviewing performance between informal or formal AARs and to help build towards the eventual AAR.

Facilitators review the planned training event scenario. They wargame likely friendly, neutral, and enemy courses of action (COAs) and work with scenario writers and opposing force (OPFOR) planners/leaders, as they are available. The wargame includes the traditional construct of actions, re-actions, and counter-actions. Facilitators consider the ability of the simulation system to model or replicate possible actions. The wargame should generate an initial collection plan.

Facilitators review doctrine; tactics, techniques, and procedures (TTP); lessons learned; and other written material pertinent to unit training objectives and projected unit missions. They refresh their understanding of sub-tasks, standards, and measures of performance and effectiveness. Unit training objectives drive the focus of this pre-execution review. Training objectives focused on collective physical-domain competencies, i.e. war fighting functions and tactical tasks, should drive review of tactical doctrine. Training objectives focused on collective cognitive-domain competencies, i.e. Team Dimensional Training, Think Like a Leader, Combat Profiling/Hunter, etc; should drive review of available source documentation. This review should result in assemblage and/or development of data collection forms and other capture/organizational measures such as checklists.

Facilitators identify existing, pertinent presentation material such as PowerPoint slides. They review how this or other training units previously conducted the mission and collect material from previous missions for potential presentation. Facilitators store all presentation material in a place and manner that allows for quick access during AAR preparation and at the AAR location.

From wargaming, facilitators identify expected key events. Key events are those training unit actions that lead directly to unit success or failure. Unit actions may include both collective (physical) and leader (cognitive) tasks, i.e. decisions. Emphasis on collective vs leader tasks, including emphasis for targeting sensors (to be discussed further below), should be based upon whether unit training objectives are focused on tactical or cognitive tasks. Key events are associated with unit interactions with other scenario elements such as OPFOR or neutrals. The unit's military decision making and/or troop leading procedures (MDMP and/or TLP) and the operation's decisive point are natural key events. Other key events might include transition between phases, initial contact, actions on the objective, potential medevacs, etc. Likely key

events become Named Areas of Interest (NAIs). As per doctrine, NAIs are phased or have opening and closing conditions, such as time or unit location. NAIs associated with physical tasks can be considered Targeted Areas of Interest (TAIs) while those associated with cognitive tasks can be considered Decision Points (DPs).

Facilitators develop a data collection plan; identifying resources (sensors) available for data collection. Sensors include the facilitator, other facilitators (such as O/Cs or O/Ts), exercise control (EXCON) personnel, and training systems instrumentation. Sensors may also include training unit personnel and unit instrumentation which collect data as part of their normal operations and will be sources of information, either prior to the AAR through conversation or in the AAR as a result of questioning.

Facilitators plan the positioning of sensors within the training space and time to collect desired data, with emphasis on open NAIs but also following the unit between NAIs. Sensors should form a network linking back to the facilitator. The facilitator controls location and targeting of the network; targeting includes focusing on key locations, events, decisions, information flows, etc. Sensors within the network should provide redundant coverage, especially as the targeted information becomes more fleeting and critical. The facilitator orients the sensor network towards the above identified key events, i.e. NAIs. The facilitator also identifies gaps in the network coverage for remediation. Finally, the facilitator plans sensor locations and targeting so as to minimize any disruption to training unit performance. The primary sensor is the facilitator him/herself and he/she should plan, if possible, on personally observing the most critical information for each key event/NAI. Ideally, the sensor network should be invisible to the training unit. This includes the positioning of the facilitator him/herself.

Facilitators plan the method they will use to monitor, with assistance, the sensor network to perceive what the training unit is doing and, more importantly, why they are doing it. The facilitator also plans methods to manage the data/information presented through the sensor network. This plan must include methods to filter and perceive data in order to identify critical information. Critical information should be identified in real time. However, this is not always possible. At times, data will likely overwhelm the ability of the facilitator and his supporters to properly manage it. The facilitator should anticipate when this is likely to occur and create the ability to designate pointers to important data to help processing during the AAR preparation phase; an example being use of bookmarking. Wargaming will assist in identifying when data will overwhelm monitoring and managing capability.

Facilitators identify desired AAR locations and coordinate participation by appropriate support personnel. An initial priority of the AAR should be the identification and collective visualization of what actually occurred within the training event. Thus, AAR locations should be selected such that they best support visualization of the training space. The next priority is the discussion of the reasons for the demonstrated performance. The location should support this priority by providing space where the training unit can temporarily escape the stresses of training and focus on self-assessment. AAR locations support this requirement by, as much as possible, providing a level of comfort and by controlling access and otherwise minimizing if not eliminating external distractions, such as noise, outside discussion, etc.

The facilitator coordinates this plan with other facilitators, EXCON, and other personnel in position to support data collection, transmission, and management. Coordination includes

rehearsing the plan, with an emphasis on rehearsing the data collection effort, especially the positioning and targeting of the sensor network and its movement based upon opening and closing of NAIs.

Training Unit Link-Up

Link-up is the initial meeting between the facilitator and the training unit prior to the start of training. Link-up is the last opportunity, prior to execution of training, for the facilitator to observe the training unit, determine last minute training unit status, and determine any refinement of training objectives. Link-up is also the primary opportunity for the facilitator to establish an appropriate relationship with the training unit and, especially, with the training unit leadership or “counterpart”. Finally, link-up is the first and primary opportunity for the facilitator to establish a positive impression upon the training unit, including personally modeling expected unit personnel behaviors.

Ultimately, the objective of the training event is the transference of training from the event to day-to-day unit performance. This transference occurs best when the training unit internalizes the training lessons. This implies ownership of those lessons by the training unit. Thus, the relationship between the facilitator and his/her counterpart should be a partnership, where the training is ultimately owned by the training unit leadership and the facilitator is seen as an assist to that leadership. In link-up, the facilitator has the ability to observe the training unit and assess the unit’s ability to take ownership of the training. Subsequent facilitator actions, including level of directive vs. participative coaching, will be dependent upon this initial and ongoing assessment. The facilitator should also be looking for which individuals might be more conducive to taking ownership of training for later utilization by the facilitator as he/she facilitates learning. Conducive individuals may not necessarily be unit leadership. The link-up is also the opportunity by the facilitator to establish his/her legitimacy with the training unit. This legitimacy is necessary to establish the relationship and provide legitimacy later within the AAR. It is best established subtly by professional behavior and by passive demonstration of experience.

Note that link-up is more critical when the facilitator is not part of the training unit’s existing chain of command.

Data Collection and Management

As training occurs, the facilitator executes his/her collection plan, adjusted to account for unit, OPFOR, and neutral changes. The facilitator pays especially close attention to unit tactical planning and preparation, i.e. MDMP/TLP because these serve as key events and because MDMP/TLP will indicate changes to subsequent key events. The facilitator stays in constant communication with the sensor network including other facilitators, EXCON, etc; relaying what the unit is doing, identifying variances from expected actions, making changes to the collection plan, making timely decisions as to network repositioning/retargeting, and making or recommending changes in the scenario execution to ensure training objectives are met, assuming the facilitator has this responsibility and authority. Monitoring includes development and maintenance of Level 3 Situational Awareness, or such awareness that the facilitator can predict future events within the training event.

There may be opportunity during the scenario to conduct During Action Reviews (DARs). DARs are conducted as the situation permits. Their benefit is the immediacy and

frequency of review. They also provide an opportunity for the facilitator to interact directly and closely with unit leadership and/or other training unit personnel. DARs are not substitutes for AARs, but augmentation to the AAR process in particular and training in general. DARs should not only be used for review but also to exchange information in preparation for an eventual AAR.

AAR Preparation

AAR preparation is a constant process but formally begins at Change of Mission (CoM) or ENDEX. Good preparation is critical to a successful AAR. During preparation, the facilitator completes data gathering and conversion of data into information. He/she then prioritizes and organizes the information gathered in order to best support unit training objectives. Finally, the facilitator familiarizes him/herself and any AAR support personnel with the information organization so that during the AAR, information is readably available to support the ultimate direction of the AAR.

Upon CoM, the facilitator begins to exchange information with all of the elements of the sensor network, including other facilitators, EXCON, OPFOR and role players, and support personnel. Use of previously developed collection/management tools is essential to quickly organize and filter raw data. Also important are unit training objectives and any higher echelon facilitator intent or information requirements. The ultimate purpose of this step is to establish SA of what occurred and why. The facilitator should scan the data flow to start identifying trends, especially trends associated with previously identified key events. These trends become an initial list of AAR focus areas, or topics for potential discussion within the AAR. Note that the facilitator should not expect that every focus area will be discussed in the AAR. The purpose of focus areas is to ensure the facilitator has correct information to support the eventual direction of the AAR.

Once the facilitator has sufficient SA, he/she should meet with their unit leader counterpart. One purpose of this meeting is to exchange facilitator and unit leader SA. This serves as part of the facilitator's data collection and management. The primary purpose, however, is to compare notes on that SA for the focusing of the eventual AAR. Again, ownership by training unit personnel and, especially, by training unit leadership of the training lessons is critical to transfer of training from the training event to permanent changes in unit performance. The end result of this exchange is a finalized and agreed upon list of prioritized AAR focus areas. Again, not all focus areas will be covered in the AAR. Also during this meeting, the facilitator and unit leadership identify who from the training unit will attend the AAR, where the AAR will be, when it will start and how long it will last, and any other special instructions such as uniform or specific information or items the facilitator and unit leadership want the unit to have present at the AAR and who will ensure it is present.

The next facilitator step is to organize available information for quick recall by the facilitator during the AAR. The facilitator works with any support personnel to ensure they are well familiar with the information available, its relationship to identified focus areas, and the quickest means to call up and visualize the information. This includes presence at the AAR of an OPFOR representative and critical role players, as required. Additionally, the facilitator should start to identify open-ended questions he/she will use in the AAR to support the various focus areas. Open-ended questions are questions requiring an answer other than yes-no. The facilitator can use questions developed during preparation or bring particularly effective

questions used in prior AARs. Identifying open-ended questions includes an initial decision of to whom to ask the question. Open-ended questions can be asked of individuals or the group in general. The facilitator identifies individual answerers based upon an assessment of who will provide an answer that will best foster group review, not necessarily who is most likely to provide the best answer. To support control over AAR content, at all times when the facilitator asks a questions, he/she should have a level of confidence in the anticipated answer, i.e. he/she should generally not answer a question for which they do not already know the answer.

Important at this final stage of preparation is an AAR rehearsal. The purpose of the rehearsal is to ensure the smooth execution of the AAR. This starts with inspection of the AAR location to ensure it meets minimum standards: it supports visualization of unit performance, it is large enough for the AAR audience and AAR facilitators including potential ingress and egress by OPFOR representative and other special briefers; is configurable to support visualization of presented material AND to foster face-to-face exchange between AAR participants; is relatively comfortable; hinders access by non-unit members; and insulates the AAR from outside disruptions. The facilitator ensures that all physical presentation material is present and that the location includes blank paper charts for note taking by the facilitator. Ensuring smooth execution also includes coordination of communications between the facilitator and AAR support personnel. It is critical that the facilitator knows exactly what the OPFOR representative and any key role players will say and that should be rehearsed. The OPFOR representative and other key roles players are generally not part of the AAR discussion and should depart the AAR after their presentation. Finally, the facilitator and support personnel should rehearse the quick recall and presentation of material anticipating the flexible flow of the AAR.

AAR Execution

The AAR execution starts with the arrival of the training unit participants. Unit leadership should establish accountability of personnel and report that all are present or explain why individuals are not. The facilitator and unit leadership should immediately establish a positive and professional learning atmosphere. Participants should remove helmets, MOLLE, and other burdensome equipment and sit down to become comfortable. Participants should be expected to have note taking material.

The facilitator introduces him/herself and welcomes participants to the AAR. He/she then provides the rules of the AAR, to include:

- AAR is not a critique. No one, regardless of rank, position, or strength of personality, has all of the information or answers. Goal is to learn from each other.
- An AAR does not grade success or failure. There are always weaknesses to improve and strengths to sustain.
- Focus of the AAR is going to be centered on key events and themes.
- Facilitator guides the discussion; participants provide input from their point of view/perspective.
- Minimal discussion on merits/faults of the simulation.

A common technique within AARs is to provide a “two-minute tape”, or a short, narrated video or other presentation of the scenario execution. This serves to establish an initial “ground

truth” and helps shift future discussion away from what happened to why it happened. If used, the two-minute tape must be non-judgmental, discussing only what happened without implying correctness.

The facilitator expedites presentation of friendly and OPFOR missions and intents, starting two echelons up. These statements are usually written on charts or slides and a technique is to have the unit leadership or other member read the friendly missions and intents. An OPFOR representative briefs the OPFOR mission, intent, and succinct plan. The representative leaves immediately afterwards. If there is no representative, the facilitator briefs the OPFOR information.

The facilitator then begins the discussion based upon the prioritized list of focus areas. The discussion should be a participative and flexible review, with the greatest emphasis on training audience acceptance of training lessons and eventual training transfer. There are several facilitator behaviors that will support the participative review:

- The facilitator is a participant in the AAR and must demonstrate desired AAR participant behaviors. He/she must be professional in appearance and demeanor. They must at all times be positive. Their statements are non-attribution. They avoid assigning blame, especially to individuals. Rather, all performance issues are approached as unit issues and emphasis is on why they occurred and how to rectify them through changes to unit behaviors. The facilitator is polite yet firm. When not speaking, they are intentionally taking notes to demonstrate the behaviors they expect from other participants, to include active listening in general and note taking in particular. The facilitator takes notes on available chart paper.
- The facilitator is constantly scanning the entire audience to gauge the AAR’s effectiveness. He/she is looking primarily for engagement in the review process. Engagement is indicated in verbal participation/contribution and in such non-verbal communication as attention, attitude, and individual note taking. The facilitator should be cognizant that although contribution is expected from all participants, individual participant learning styles will vary and there may be individuals who best learn through passive observation. The facilitator should work to cause universal participation though they should remember that, although participation is important, the most important outcome of the AAR is ownership by the unit of training lessons and subsequent training transfer. Too much pursuit of participation may have an opportunity cost in less focus on lessons and transfer of ownership. This is the art of the AAR. Generally speaking, there are within the AAR audience individuals more critical to successful transfer, such as unit leadership, and these individuals’ participation might be more critical than the participation of other individuals.
- The primary means for fostering group participation and interaction is through the use of open-ended questions. These are questions that require something other than a yes-no answer. The facilitator may ask questions of individuals or the group. They make sure all members of the training audience participate fully in the AAR by consistently asking open-ended questions and taking care to solicit responses from all, not just those that are outspoken. The primary purpose of asking an open-ended question is to foster group participation and review, not automatically to elicit the best, most accurate, or most complete answer. In addition to open-ended questions, the facilitator should be prepared

to ask follow-up questions. These are “so what” questions purposed to elicit a deeper understanding of what happened and why. They can also be used to foster group discussion by redirecting statements or questions to within the group. Follow-on questions might be standard, such as:

- Why do you think that way?
- What do you think of what was just said?
- How could it have been done differently?
- The facilitator should use records (video, audio, statistics, etc) of unit performance primarily to help establish ground truth, or what actually occurred in the training space. Use of records is dangerous as it can be interpreted by individuals as “gotcha” material, or an effort to attribute blame.
- The facilitator assists in training transfer by making sure the training is perceived as relevant to the training audience. To do this, he/she can relate the training to operational requirements and/or demonstrate the legitimacy of the training in addressing those requirements.
- The facilitator should demonstrate support for the training audience’s experiences. For example, recognize and positively reinforce the training audience’s correct actions in the training event. It is also important to mentor the training audience. Therefore, the facilitator should expedite a full explanation of the rationale behind correct actions or guide the training unit towards a well-informed, accurate assessment of the training event and performance, as needed.
- The facilitator is an expert information source. Information brought by the facilitator includes doctrinal norms from published doctrine and TTP. Information also includes examples of other methods, such as how other units executed in training and, more importantly, how these tasks are being done in active theaters.
- The facilitator acts to prevent non-productive interaction. This may include individual blaming, or blaming performance on causes external to training unit control, such as technical limitations, equipment or personnel shortages, or scenario faults. The facilitator prevents non-productive interaction by emphasizing “why” and avoiding “who”. They use plural nouns such as “we” and “us” in their conversation. Most importantly, they reinforce that good organizations look internally to fix problems rather than externally to blame problems.
- Facilitators should be open and up front if/when they identify their own information gaps. They avoid discussing subjects of which they have no or insufficient knowledge. If these subjects arise, they refer back to the unit participants to provide information. They note these personal information gaps and act after the AAR to fill them.

AARs are events within a training process or continuum. The facilitator incorporates previous events, such as earlier AARs or DARs. This incorporation includes identification of trends and discussion of unit responses to these trends.

Ownership of the AAR by the unit participants is critical. This means that the training audience must have some control over the actual direction of the AAR. The facilitator should

accept this and is prepared for it by being very familiar with the information on unit performance and being able to work with support personnel to call up information as required. This requires non-linear access to information. The facilitator is also prepared for this flexibility through prior discussion with unit leadership. Part of the art of the AAR is determining how far and how long to let the discussion wander from planned focus areas. Weighing heavily into this decision is an assessment by the facilitator and unit leadership as to the derived benefit to training objectives and ultimate unit performance of the current discussion.

Concern over wandering discussion should be limited. Unit professionalism tends to serve as an invisible hand to keep open discussions focused on real improvement. Facilitators should favor free discussion, but when the facilitator deems that the discussion has become non-productive, he/she should use open-ended questions, such as how the discussion pertains to specific training objectives, to subtly draw the discussion back to desired focus areas, as opposed to blatantly shutting down or shifting discussion.

Follow-on questions are particularly important when the AAR is focusing on cognitive tasks, as the “ground truth” consists of what was sensed and understood by individuals, what perception was communicated, and the decisions based upon that communication. This cognitive “ground truth” will likely be not apparent from sensor network information, though recorded communications probably provides the most direct access.

In the AAR, as the participants identify specific issues, the facilitator expedites the unit’s identification of unit changes to resolve issues. Importantly, the facilitator expedites assignment of responsibility for executing the change and a schedule for executing that change. The facilitator and training unit should consider this a contract for improvement. Review of this contract, including review of issues, unit plans to resolve those issues, and individual responsibilities within those plans, is an effective manner to close an AAR.

AAR Follow-Up

Immediately after the AAR, the facilitator meets with his counterpart to review the execution of the AAR and AAR results. This is an opportunity to refine the AAR generated contract, including mutually clarifying any points of confusion. This is also an opportunity for the facilitator to discuss the execution of the AAR with his/her counterpart, including identifying methods to improve the next AAR.

The facilitator also reviews AAR results with fellow facilitators, especially superiors. Facilitators review their performance. They also look for cross-organizational trends. This review might lead to changes to facilitator plans or changes to the training event.

Finally, facilitators save AAR products for future use within the training event and within future training events. Products include prepared open-ended questions, information presentations, and examples of how units performed various tasks. These examples are sanitized to remove any reference to a specific unit. They then become “a-ways” or performance models for future AARs.

APPENDIX C: Acronym List

AAIRS- After Action Intelligent Review System
AAR - After Action Review
ADA - Air Defense Artillery
AKO - Army Knowledge Online
BC – Battle Commander
BCTP - Battle Command Training Program
CACCTUS – Combined Arms Command and Control Trainer Upgrade System
CALL – Center for Army Lessons Learned
COI - Community of Interest
CRM – Customer Relations Management
CTCs - Combat Training Centers
DAR – During Action Review
DIS – Distributed Interactive Simulation
DIVAARS - Dismounted Infantry Virtual After Action Review System
ELO - Enabling Learning Objectives
EXCON – Exercise Control
FA – Functional Area
ISD – Instructional Systems Design
ITAAR - Integrated Theory of AAR
ITS – Intelligent Tutoring Systems
JELC – Joint Exercise Life Cycle
JFCOM – US Joint Forces Command
JRTC – Joint Readiness Training Center
JTS - Joint Training System
LTS - Long- Term Memory Storage
MDMP – Military Decision Making Process
NTC - National Training Center
O/C - Observer Controller
O/CT – Observer Controller Trainer
OPFOR – Opposition Forces
POI - Programs of Instruction

SA – Situation Awareness

SECI – Socialization, Externalization, Combination and Internalization

SO2 – Study of Organizational Opinion

STX – Situation Training Exercise

TLO - Terminal Learning Objective

TLP – Team Leading Procedures

TRADOC – U.S. Army Training and Doctrine Command

TTP – Tactics, Techniques, and Procedures

USASMA - U.S. Army Sergeants Major Academy

VIRTE - Virtual Technology and Environments

WLC - Warrior Leaders Course