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for the Behavioral and Social Sciences**

Research Report 1961

**Self-Learning Among Army Noncommissioned
Officers: Experiences, Attitudes, and
Preferred Strategies**

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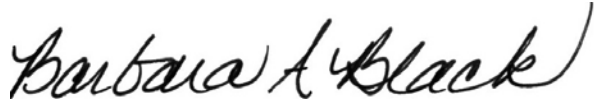
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SELF-LEARNING AMONG ARMY NONCOMMISSIONED OFFICERS: EXPERIENCES, ATTITUDES, AND PREFERRED STRATEGIES

EXECUTIVE SUMMARY

Research Requirement:

Army Noncommissioned Officers (NCOs) often need to complete tasks they have not been formally trained to do. When NCOs are able to learn effectively on their own, they are also better able to support their performance and professional development across a broad array of leadership and technical skills. In this research, we sought to discover how successful NCOs learn on their own, focusing on (a) identifying, documenting, and describing common elements of NCO self-learning experiences, and then (b) identifying key self-learning skills that NCOs may use to enhance job performance and speed-up learning and adaptability. This research was intended to support the Institute for NCO Professional Development's (INCOPD's) effort to enhance and refine self-learning skills in the NCO Corps.

Procedure:

To accomplish these objectives, we used a mix of focus group interviews and measurement-based approaches to (a) document the types of situations in which NCOs learn on their own, (b) identify what NCOs do when they learn on their own, and (c) measure the strategies NCOs prefer to use when they learn on their own. In 40 focus group interviews, we explored experiences of self-learning with NCOs ($N = 123$) from the ranks of Specialists/Corporals (E-4) through Master Sergeants/First Sergeants (E-8), from different components of the Army, and from different Military Occupational Specialty (MOS) backgrounds. In these interviews, we asked NCOs to describe in detail their self-learning experiences. We analyzed the NCOs' comments and distilled them into a thematic framework of NCO self-learning experiences. Using the thematic framework, we developed tools to measure the strategies these NCOs preferred to use when learning on their own. The instrument was administered online to NCOs ($N = 1,345$). The sample included all NCO ranks, almost all Army military occupational specialties (MOS) series, and each of the duty status components.

Findings:

Based on the focus group interviews, we documented the types of situations in which NCOs engaged in self-learning and developed a thematic framework to describe NCOs' experiences with learning on their own for their Army jobs. Results indicated NCOs engaged in self-learning to (a) refresh old skills and/or acquire skills for new jobs/assignments, (b) build skills for leader roles or promotions, and (c) pursue personal development/achievement. Five core themes were identified in the NCOs' descriptions of their self-learning activities: (a) *Having the Right Attitude and Motivation*, (b) *Planning and Analyzing My Learning Situation*, (c) *Seeking Information About My Topic*, (d) *Making Sense of What I Am Learning*, and (e) *Evaluating How Well I Am Learning*. The meaning of each of these themes was further defined by sets of subthemes. A variety of individual attitudes, time-management skills, social skills,

self-awareness, and perceptual and interpretive abilities must come together to enable an NCO to execute a self-learning project effectively. This thematic framework allowed us to understand self-learning as it arises within the unique professional contexts and work situations of Army NCOs.

Based on the thematic framework, we developed the NCO Self-Learning Strategies Questionnaire (2 versions) with an emphasis on maintaining fidelity to the NCOs' accounts of their experiences. NCOs from across Army NCOAs participated in data collection using the scenario-based version of the Questionnaire.

We found that the Questionnaire was highly reliable according to standard psychometric indices (reliability coefficients for every factor were above 0.89). Responses indicated that, overall, NCOs strongly believed that they take responsibility for maintaining their own competency, and that they stay knowledgeable, persist in their learning efforts, and improve their learning skills.

Among the questions related to self-learning strategies/techniques, *Evaluating Learning* was the highest rated factor overall, with NCOs viewing asking trained Cadre/SMEs for advice and feedback on their performance as most relevant to their learning strategies. Following this was the *Information Seeking* factor. The most relevant *Information Seeking* strategies dealt with learning hands-on, collecting examples of completed work, reflecting on one's own and others' experiences, as well as tracking down good sources of information (e.g., libraries, internet searches, CALL). *Planning and Analysis* was the next highest rated factor. Key strategies in *Planning and Analysis* emphasized identifying what NCOs hoped to be able to do as a result of what they were learning, prioritizing tasks and topics, defining what needed to be learned (the topics to be covered), and planning step-by-step how to get to their goal(s). Finally, NCOs rated the *Sensemaking* factor lowest overall. The strategies most emphasized in *Sensemaking* concerned spending extra time focusing on information that seems new, unusual, or confusing; seeking out alternatives and different points-of-view to help challenge/verify what is being learned; and summarizing what is being learned in one's own words.

Some demographic characteristics were found to be highly related to attitudes and motivations as well as self-learning strategies and techniques, including career intentions and Career Management Fields. Other characteristics were less related, such as NCO rank, age, years in service, and civilian education.

Utilization and Dissemination of Findings:

This research was combined with a review of the scientific literature to develop storyboards for an NCO Self-Learning Handbook (to be presented in a subsequent ARI publication). The research findings were briefed to the Institute for Noncommissioned Officer Development, Fort Eustis, VA, and participating NCOAs in September 2011, presented at the Maneuver Center of Excellence/Columbus State University, Learning and Technology Symposium, Columbus, GA, June 2011, and presented at the Society for Industrial/Organizational Psychology's Annual Conference in San Diego, CA, April 2012.

SELF-LEARNING AMONG ARMY NONCOMMISSIONED OFFICERS: EXPERIENCES, ATTITUDES, AND PREFERRED STRATEGIES

CONTENTS

	Page
INTRODUCTION	1
Literature and Science of Self-Learning	2
What are Self-Learning Strategies?	4
Self-Learning, Noncommissioned Officers, and the Army Context.....	6
Self-Learning and Professional Development	7
RESEARCH DESIGN	9
PHASE I: THEMATIC ANALYSIS OF NCO SELF-LEARNING EXPERIENCES.....	11
Method	11
Participants.....	12
Sampling Procedures	13
Data Collection Procedures.....	14
Results: Self-Learning Situations and Themes	15
Theme 1: Having the Right Attitude and Motivation	18
Subtheme 1.a: Needing to Know	18
Subtheme 1.b: Willingness to Reach Out to Others to Develop as an NCO	19
Subtheme 1.c: Taking Initiative to Solve Problems.....	19
Theme 2: Planning and Analyzing My Learning Situation	20
Subtheme 2.a: What Do I Need to Learn?	20
Subtheme 2.b: What Do I Anticipate for the Learning Process?	20
Subtheme 2.c: What are the Goals?	21
Subtheme 2.d: Establishing Priorities for Tasks and Topics	21
Theme 3: Seeking Information about My Topic.....	22
Subtheme 3.a: I Like to Learn Hands-On	22
Subtheme 3.b: Show Me What Right Looks Like	22
Subtheme 3.c: Using Personal Experiences and Examples	23
Subtheme 3.d: Getting to the Information I Need.....	23
Theme 4: Making Sense of What I Am Learning.....	25
Subtheme 4.a: Being Aware of My Thinking.....	25
Subtheme 4.b: Knowing What to Do When I Don't Understand	25
Subtheme 4.c: Challenging/Verifying What I Know/Believe	26
Subtheme 4.d: Making What I Am Learning My Own	26
Theme 5: Evaluating How Well I Am Learning.....	27
Subtheme 5.a: Relying on the NCO Network.....	27
Subtheme 5.b: Did I Accomplish My Goals and/or Complete My Task?	27
Subtheme 5.c: Can I Explain/Teach Others What I Have Learned?.....	28

CONTENTS (continued)

	Page
Summary Statement of the NCOs' Experiences	29
SELF-LEARNING STRATEGIES QUESTIONNAIRE DEVELOPMENT	29
PHASE II: EXAMINING NCOs' SELF-LEARNING PREFERENCES	32
Method	32
Participants	33
Data Collection Procedure	35
Results	36
Overall Preferred Learning Strategies of Army NCOs	37
Analysis of Preferred Self-Learning Attitudes and Strategies by NCO Demographics	39
Career Intentions	42
Career Management Field	42
Gender	42
Time in Service	43
Noncommissioned Officer Rank	43
Age	44
Civilian Education	44
Duty Status	44
DISCUSSION	44
Overview of the Research Effort	45
Conclusions	46
Self-Learning is Not Learning on Your Own	46
Self-Learning and Cognitive Self-Awareness	47
Techniques to Structure the Learning Process	48
Pitching Self-Learning to Subordinate Leaders	49
Demographic Characteristics Associated with Self-Learning	50
Recommendations	51
REFERENCES	53
ACRONYMS	59
APPENDIX A. EXPERIENCE-BASED NCO SELF-LEARNING STRATEGIES QUESTIONNAIRE	A-1
APPENDIX B. SCENARIO-BASED NCO SELF-LEARNING STRATEGIES QUESTIONNAIRE	B-1

CONTENTS (continued)

	Page
APPENDIX C. FOCUS GROUP INTERVIEW PROTOCOL (FIRST SET OF SESSIONS)	C-1
APPENDIX D. FOCUS GROUP INTERVIEW PROTOCOL (SECOND SET OF SESSIONS)	D-1
APPENDIX E. BACKGROUND INFORMATION FORM.....	E-1
APPENDIX F. ITEM AND FACTOR LEVEL PSYCHOMETRIC ANALYSES	F-1
APPENDIX G. SELF-LEARNING STRATEGIES QUESTIONNAIRE RESULTS BY DEMOGRAPHIC VARIABLES	G-1

LIST OF TABLES

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF THE FOCUS GROUP SAMPLE.....	12
TABLE 2. CRITICAL LEARNING SITUATIONS IN WHICH NCOs DESCRIBED BEING ENGAGED IN SELF-LEARNING	15
TABLE 3. NCO DIFFICULTY RATINGS FOR THE SCENARIOS.....	32
TABLE 4. OVERALL DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE	33
TABLE 5. SAMPLE SIZE AND CHARACTERISTICS OVERALL AND BY RANK.....	34
TABLE 6. PERCENT OF NCOS BY RANK AND COMPLETED CIVILIAN EDUCATION	35
TABLE 7. RELIABILITIES FOR FACTORS ON THE NCO SELF-LEARNING QUESTIONNAIRE	36
TABLE 8. FIT INDICES FOR THE 5-FACTOR MODEL OF NCO SELF-LEARNING STRATEGIES	37
TABLE 9. RANKED FACTORS/ITEMS IDENTIFYING NCOS' OVERALL PREFERRED LEARNING STRATEGIES	37
TABLE 10. SIGNIFICANT EFFECTS OVERALL BY DEMOGRAPHIC VARIABLES (ORDERED LEFT TO RIGHT BY STRENGTH OF EFFECT).....	40

LIST OF FIGURES

FIGURE 1. A CONCEPTUAL FRAMEWORK OF THE SELF-LEARNING SITUATION	5
FIGURE 2. FLOW DIAGRAM OF THE RESEARCH PROCESS.....	11
FIGURE 3. THEMATIC FRAMEWORK OF NCO SELF-LEARNING.....	17
FIGURE 4. INCOPD NCO CORE COMPETENCIES MODEL.....	51

Self-Learning Among Army Noncommissioned Officers: Experiences, Attitudes, and Preferred Strategies

Introduction

An anonymous Army Noncommissioned Officer (NCO) once affirmed, “the day you stop learning is the day you stop leading.” Throughout their careers, successful NCOs are learning how to learn on their own. Whether Sergeants, Staff Sergeants, or Sergeants Major, NCOs often take on tasks they were not formally trained to do. On these occasions, NCOs adapt and learn on the job. When learning on the job, NCOs figure out what they need to know in order to carry out their assigned task or mission. Some NCOs also look ahead to what they may encounter in the future and undertake their own learning projects to address those expectations. Ultimately, what individual NCOs learn on their own builds diversity in the knowledge and skills of the NCO Corps. In this way, self-learning is a process that enhances the Army’s capabilities, as NCOs bring greater understanding and innovation to their work.

Being able to learn effectively on their own—to engage in self-learning—is a critical professional development skill for NCOs. Even so, research has not yet focused on how self-learning happens within the NCO Corps. The U.S. Army Sergeants Major Academy (USASMA) has acknowledged that it is a critical component of personal self-development.¹ Army doctrine² and leadership³ have also emphasized the connections between self-initiated learning, self-development, and professional development. NCOs are provided some training on how to learn on their own within the Structured Self-Development courses⁴ and through other Army training resources, such as the Combined Arms Center’s *Army Self-Development Handbook*.⁵ While these training resources are available, we still know little about the strategies and techniques successful NCOs actually use when learning on their own, and how their learning preferences may develop across a career. With greater understanding of these issues, we may be better positioned to focus training on acquiring and honing critical self-learning skills that can aid NCOs throughout their careers.

In this research effort, we aimed to discover how NCOs learn on their own for their Army jobs. Our established objectives were to:

- Identify, document, and describe common elements of self-learning experiences as described by successful NCOs
- Identify key self-learning skills that NCOs may learn to use to enhance job performance and speed-up learning and adaptability

¹ USASMA briefing on Structured Self-Development (accessed through AKO, 22 December 2011). Self-learning is described as self-initiated learning; it is also described in the Army as self-structured learning.

² Army Noncommissioned Officer Guide (FM 7-22.7)

³ See SMA Chandler’s editorial in the NCO Journal, July 2011; also DA PAM 600-25, 2008, pg. 5-8

⁴ USASMA Structured Self-Development Course catalog (accessed through AKO 22 December 2011).

⁵ Combined Arms Center, Center for Army Leadership, *Army Self-Development Handbook*, includes a section on “Learning how to Learn” (2008; see pg. 28-39).

To accomplish this, we (a) documented the types of situations in which NCOs learn on their own, (b) identified what NCOs do when they learn on their own, and (c) created a tool to measure the strategies NCOs prefer to use when they learn on their own. The research was conducted to support the Institute for NCO Professional Development (INCOPD) in enhancing and refining self-learning skills in the NCO Corps.

The remainder of this introduction will address selected perspectives on self-learning, covering (a) a brief review of the self-learning literature, (b) our concept of learning strategies, (c) the relationship between self-learning, NCOs, and the Army context, and finally (d) self-learning and professional development. The overview presented here is intended to be summative and selective. For readers interested in a more detailed and comprehensive review of the literature, we recommend Wisecarver et al. (2012).⁶

Literature and Science of Self-Learning

An early researcher of self-learning, or self-directed learning, Malcolm Knowles (1975) described it in the following way:

A process in which individuals take the initiative, with or without the help of others, to diagnose their learning needs, formulate learning goals, identify human and material resources for learning, choose and implement appropriate learning strategies, and evaluate learning outcomes (Knowles, 1975, p.18).

Dejoy and Dejoy (1987) offer an abridged version, defining self-learning as a “self-motivated and self-managed planning process adults use to learn, change, and improve” (Dejoy & Dejoy, 1987, p.64).

In spite of what seems a complex activity, self-learning is very common among adults (Tough, 1971). Tough’s research established that the average adult spends about 700 hours a year acquiring “knowledge, skills, perceptions, attitudes, habitual reactions, insights, perspectives, that the adult develops and changes” (pg. 4). That is a little under two hours a day, for each day of the year. He also found that in some professions this average almost doubles. With increasing access to information on the internet, these statistics from the late-1960s/early-1970s are likely underestimates. For a few individuals, who are sometimes referred to as autodidacts (i.e., ‘self teachers’), self-learning can be a far more encompassing activity than a few hours a day.

When it comes to self-learning, the way in which a person reflects on his or her learning process may influence how well he or she learns (Boekarts & Cascallar, 2006). Learning is both about changing behavior, in a scientific sense, and changing the way learners experience themselves and their world, in a more personal sense (Mednick, Pollio, & Loftus, 1973; Pollio, 1982). This issue has been addressed in recent research, refining our understanding of learners first-person experiences of learning across various contexts. For instance, Marton and Booth

⁶ Wisecarver, M., Foldes, H., Ferro, G., Cullen, M., Graves, T., Rauchfuss, G., Wolfson, N., and Kraiger, K. (2012). *Defining Antecedents for Noncommissioned Officer Self-Learning: A Review of the Literature* (Technical Report 1300). U.S. Army Research Institute: Arlington, VA.

(1997) and Marton and Tsui (2004) have examined problems related to the interpersonal dynamics of different learning situations/contexts, and the attitudes and beliefs that learners have about their learning process. Based on their findings, learners seem to take very different attitudes about what it means to them to *learn* something, and those different attitudes may affect what they do when they are learning.

Marton and Booth (1997) blended both first-person experiences (i.e., a “subjective” perspective) and third-person scientific observations (i.e., an “objective” perspective) in their concept of learning. They argued that the science of learning needs to address the structural aspects of the self-learning experience—that is, *when*, *where*, and *how* self-learning happens. It also needs to address the referential aspects of the learning experience—*what it means to the learner* who is engaged in an act of self-learning. Bringing these two aspects of learning together highlights that we must take into account the context in which self-learning takes place and the attitude the self-learner has toward his or her learning situation (Boekarts & Cascallar, 2006). This perspective adds to traditional scientific conceptualizations of learning that may be derived from only analyzing test scores or observing a learner performing a newly acquired skill. The learning process is as much about the event in which it takes shape as it is about the content being learned and the measurable characteristics of the learner and his or her behavior.

Marton and colleagues have described what they believe are two basic ways that individuals conceive of learning (Marton, Beaty, & Dall’Alba, 1993). They argue that these personal concepts of learning may influence the attitude and approach a learner takes in shaping his or her learning process and in identifying goals for the activity he or she is undertaking. Learners, they argue, tend to break into two groups: those who view learning as *reproducing knowledge*, and those who view learning as *seeking meaning*.

According to Marton, Beaty, & Dall’Alba (1993), learners who focus their learning process on *reproducing knowledge* tend to view the learning process in terms of goals related to (a) increasing their quantity of knowledge, (b) memorizing facts, and (c) standard applications of what they know. On the other hand, learners who are oriented toward *seeking meaning* tend to focus on goals related to (a) understanding what they are learning both concretely and conceptually, (b) coming to see things in a different way, and (c) being changed (i.e., developing) as a person by what they are learning. These different perspectives are related to different attitudes and approaches to acquiring, using, and creating knowledge. Some learners may take the attitude that learning is a process of absorbing knowledge, and others may approach learning as a process of taking action, with learning oriented toward a personally meaningful goal; this latter group is creating and using knowledge (Boden, Franklin-Guy, Gibson, Lasker-Scott, Scudder, & Smartt, 2008).

These orientations carry over into how learners prefer particular learning contexts and establish particular goals for their learning activities. Learners who view their task as reproducing knowledge may assume that they need to rely on authorities to give them access to a body of information that is cumulative and correct. They tend to think in traditional terms, as Dewey (1938) described, and may prefer traditional learning contexts and roles—e.g., being a student in a classroom with an expert telling them what they should know. Learners who view their task as seeking meaning, may instead work to explore the complicated relationships among

different ideas, may want to understand better how ideas, concepts, and evidence become interrelated in their own and others' experiences, and may rely less on formal authorities to tell them what is valuable to know. This group may focus more on having rich, meaningful experiences and identifying continuities among those experiences in open dialogue with others who have similar interests (cf. Dewey, 1938). It would seem that this latter group would judge the value of what they are learning on the basis of how it fits with what other sources have to say, and how it was useful to them, helping them to reach a new insight or acquire a new skill that helped them accomplish personally relevant goals (Marton, Beaty, & Dall'Alba, 1993). For the learner who is seeking meaning, the act of learning seems far more personal and individualized. On this account, seeking meaning seems to present the more advantageous perspective for a self-learner as it encourages an attitude of self-reliance and personal responsibility for one's own learning process.

What are Self-Learning Strategies?

From the research discussed above, we know that individuals take on learning projects where they determine how and what they learn. We also know that learners may adopt different attitudes toward what they are learning, or even toward learning in general, and that these attitudes influence the goals they set for their own learning projects and how they go about achieving their goals.

A straightforward way of defining a learning strategy then is as something learners do when executing their learning process to bring about change in themselves or their environment. Learning strategies call attention to how what learners choose to do can help or hinder them in achieving their goals. The learner's goal may be related to acquiring new skills, completing a work assignment, engaging in some new behavior, persuading a colleague or peer, expanding a base of knowledge, gaining a new insight, or discovering and exercising a new ability (Tough, 1971). Each outcome may require a different type of learning strategy to link information about a knowledge domain to the learner's goal(s). In the most practical sense, a learning strategy can be seen as a technique used to learn what is needed in order to accomplish a goal or set of goals within what the self-learner perceives to be a reasonable amount of time (cf. Wisecarver et al., 2012).

While the definition may seem straightforward, there is a lot of complexity in it—as it assumes some things about the learner and the learning process. First, it assumes that self-learners choose strategies to fit their goals, and that this choice requires ongoing self-evaluation within the learning process. Second, self-learners are willing to engage in an iterative process, prepared to try and sometimes fail, and then try again. With those assumptions in place, the power that self-learning strategies exert throughout an individual's learning process becomes apparent.

When self-learning, we choose to learn, we choose what we learn, and we choose how we go about it. We choose what we attend to in a situation and how we ultimately use the information we have learned. Learners are not passive agents that are solely acted on. All learners have to be in some sense strategic when undertaking their own learning process, whether on their own or in a classroom with an instructor (Martin & Tsui, 2004). Individuals may differ

in terms of the learning techniques they are good at using, or the quality of the choices they make when they are learning, or their ability to persist in establishing and getting to the right goal for their unique situation. It is the choices a learner can and does make that gives shape to their unique learning process.

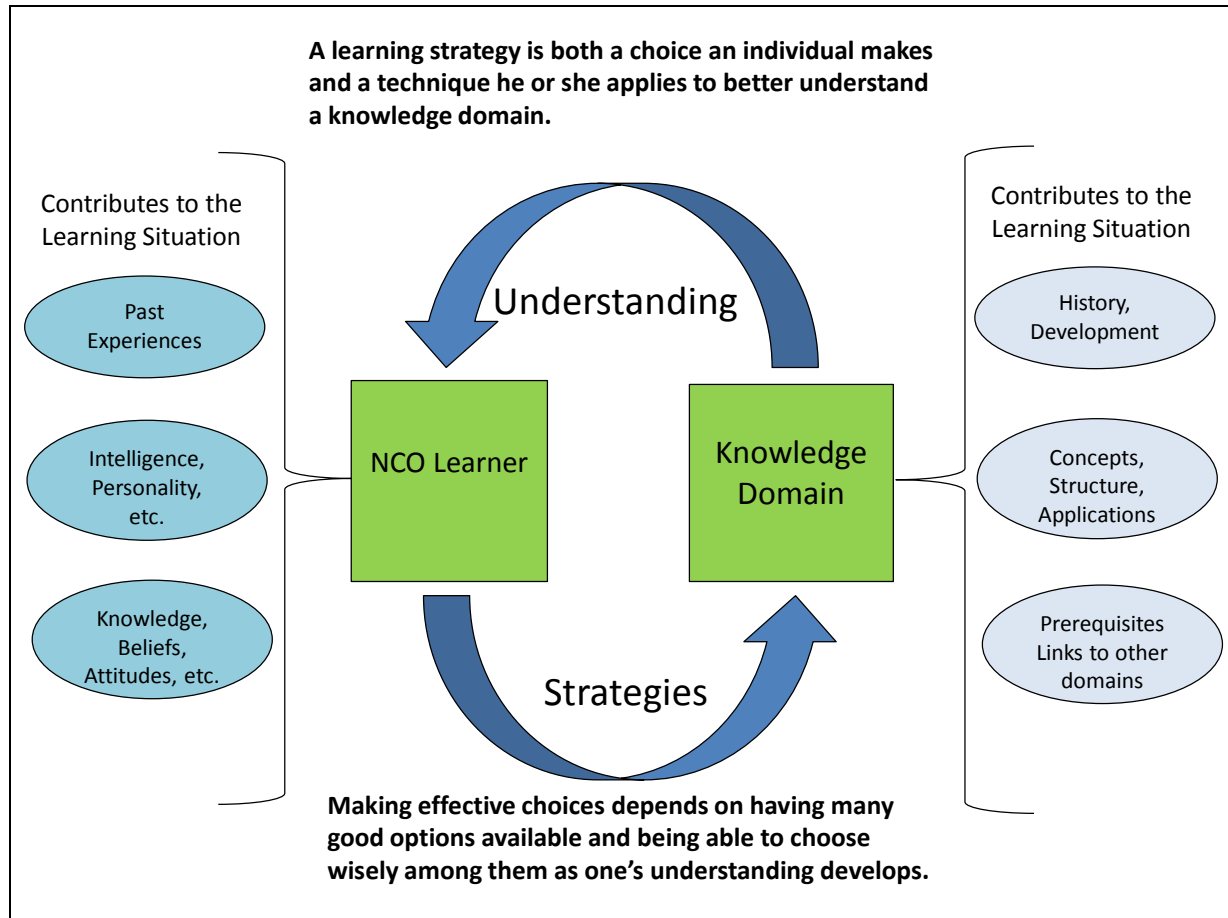


Figure 1. A Conceptual Framework of the Self-Learning Situation

As Figure 1 illustrates, learning is an iterative process. We engage with the knowledge domain about which we are trying to learn, and little by little our understanding of it develops. Our emerging understanding then informs how we should continue to engage with that domain. In the iterative process of learning, we ideally seek to apply techniques that are effective in allowing us to manage the learning process, elicit information, evaluate that information, and evaluate how what we are learning is changing us (cf. the concept of the ‘hermeneutic circle’ in Gadamer, 1960; 1987).

In this process, a skilled learner is self-monitoring, self-assessing, and determining what he or she needs to do to maintain the learning process. This type of self-reflection enhances the effectiveness of the ongoing learning process. Breidert and Fite (2009) addressed the role of self-assessment in the learning process by claiming that when individuals are learning on their own, they need to establish and monitor specific, and measurable, outcomes of their learning. If learners do not monitor their learning in this way, it can be easy for them to slip into

overconfidence, believing they possess a higher level of skill than is warranted. To self-assess reliably, then, individuals need to approach their learning task oriented toward self-grading and evaluating competence. If learners focus too much on how confident they feel in performing the task, the ambiguity of the task and their own subjective biases may encourage them to overestimate their actual level of knowledge and skill. Consequently, self-learners may be less accurate in determining their own ongoing training needs if they allow a confidence bias to affect the accuracy of their self-assessments. Accurate self-assessment is required to maintain an effective self-learning process and select the right learning strategy at the right time.

The critical point is that self-learning is an ongoing process of developing, testing, and revising behavior and beliefs on the basis of perceiving some new event or new evidence as relevant to our present concerns and goals (Gadamer, 1987). When learning, the learner is engaged in a process of choosing and applying strategies/techniques for their learning situation, with a focus on understanding better something they are experiencing and/or are required to accomplish. In order to make good choices when learning, learners need to recognize that they have many options for how to learn, need to test their understanding, need to be willing to adjust course during the learning process. The process of developing as a learner is one of acquiring facility with a variety of strategies and techniques and learning how to apply them effectively. Skilled self-learners are able to choose among many strategies they recognize as viable options, as their understanding continues to develop and they reach the goal(s) they established for themselves.

Self-Learning, Noncommissioned Officers, and the Army Context

Self-learning fills a critical function in the Army. While the Army is traditional in many ways, it is also a very dynamic and innovative organization. This dynamism can be seen through frequent revisions of Army doctrine, regulations, technologies, weapons, missions, tactics, and culture. All can change, and sometimes abruptly. NCOs are responsible for enacting these changes within the Army, face-to-face with Soldiers. They work in situations in which they are constantly challenged to learn, change, and improve. Given the nature of their work, they also help other NCOs and Soldiers to learn, change, and improve. Successful NCOs learn how to motivate and manage their own learning processes and how to motivate and support the learning processes of others. They set the example for the Army and their Soldiers.

As professionals, Army NCOs are unique. They are unique in their role as frontline leaders and trainers within the Army. They are also unique in that they work in environments that vary more than those of most other professionals. They are responsible for the well-being, training, and performance of their Soldiers in what are at times extremely dangerous situations. Recommending ways to support and develop self-learning strategies for the NCO Corps initially requires an approach that is sensitive to their role in the Army and the situations in which they learn on their own for their Army jobs.

Notable in our review of the literature was the lack of empirical research directly addressing self-learning within the Army NCO Corps. One fascinating historical text traced the development of NCO educational programs in the U.S. Army (see Elder, 1999). In particular, Elder (1999) describes how, following the end of conscripted service, the NCO Corps took on a

new identity as a body of professionals, needing to undertake its own professional development initiatives. Before that time, skilled professionals would be conscripted into the service as NCOs, perhaps completing some training in a military specialty area before assuming their duties. When their conscription had ended, many would leave the Army to return to their civilian occupations. While it seems that this professionalization of the NCO Corps would have certainly increased the need for self-learning among its members, Elder fails to address this issue. This absence of evidence in Elder's historical account does not mean that Army NCOs were not practicing self-learning. NCO self-learning has been addressed indirectly in research examining NCO career development and distance learning (Wilson, 2006), NCO leader development policy initiatives (Department of the Army, Combined Arms Center, 2002), NCO self-study prior to residential coursework (Drenth, Kubisiak, & Borman, 2001), NCO self-assessment prior to promotions (Keenan & Campbell, 2006), and using prior experience to test out of NCOES courses (Wampler & Blankenbeckler, 2008).

The Combined Arms Center's Center for Army Leadership (CAC-CAL) sought to address self-learning in the Army by publishing the *Army Self-Development Handbook*, which included a section entitled "Learning how to Learn" (2008; see pg. 28-39). This section of the CAC-CAL Handbook covers topics related to motivation, effective learning methods, and how to learn from written materials. It presents techniques such as *Scan, Question, Read, Recite, and Review (SQ3R)*, and other popular learning techniques discussed in published research literature. One shortcoming of the Handbook, however, is that the techniques presented were originally developed to be applied in academic settings, often with secondary school and traditional college-aged students. They are what are referred to in academic contexts as study skills. That said, the recommendations, information, and activities presented in the CAC-CAL Handbook provide useful information for a general audience of Army learners, regardless of their particular roles within the Army, and should be utilized by NCOs who are seeking information on topics related to self-development. In addition to the CAC-CAL Handbook, a section of the NCOs' Structured Self-Development course covers self-directed/self-initiated learning principles.

Our research supports and adds depth to the objectives that motivated Army stakeholders to develop these training materials. Here we focus not on generalized scientific principles, but instead on how the self-learning process is actually enacted within the NCO professional context. These are complementary perspectives. What we are doing with this research is focusing on how these types of techniques are used preferentially by NCOs to achieve goals that are relevant to their work environment. For NCOs who are interested in exploring the principles behind various study skills and strategies, we recommend a website developed and maintained by Landsberger (1996).⁷

Self-Learning and Professional Development

How professionals develop through self-learning has been studied across a variety of professions, to include: physicians (Campbell, Silver, Sherbino, Cate, & Holmboe, 2010), surgeons (Gagliardi, Wright, Victor, Brouwers, & Silver, 2009), scientists (Clark & Olsen, 2010), social workers (Cooper & Pickering, 2010), pharmacists (Janke, 2010), corporate

⁷ For an interesting and user-friendly discussion of various study skills and strategies, see www.studygs.net (accessed 9 December 2011; author: Joe Landsberger, 1996).

managers (Leonard & Marquardt, 2010), teachers, and teacher educators (Minott, 2010), among others. One objective common among the cited research is how to encourage and improve self-directed learning skills in order to foster professional development and life-long learning.

The *Army Noncommissioned Officer Guide* (FM 7-22.7) emphasizes self-development as one of three central components of NCO professional development. Self-development is described as the process that brings together personal experience with formal training, helping NCOs consistently improve as leaders. Self-development from this perspective includes both those experiences that are structured by the institution and those that are self-selected, with the individual NCO pursuing learning on his or her own. FM 7-22.7 also identifies that a shift in self-development emphasis occurs as junior NCOs transition to senior NCOs, from a highly structured self-development curriculum for junior leaders to a self-selected self-development for senior leaders. In other words, NCOs must develop and continue to hone their self-learning skills across the course of their careers, as they will eventually need to be largely self-sufficient in meeting their professional development needs (AR 350-1, para 1-11.c.).

Many technical skills and abilities support individual career development. Fundamental to developing a broad array of technical skills and abilities is how well an individual can take control over, be responsible for, and direct his or her own professional learning (Bolhuis, 2003). In other words, self-learning skills support the development of other knowledge, skills, and abilities. For all contemporary professions, not just the Army Profession, a practitioner needs to be able to make sense of changing ideas and practices, as what was learned in school is not necessarily what is current in the field, and what is current now is not what will be in the future (Sharma & Monteiro, 2010).

Professional knowledge and practice is developing at an increasing pace, and with the internet, more information than ever before (albeit varying in quality) is available to an individual learner at any given time. This presents individuals and organizations with difficulties in keeping up with and in evaluating what information is good, or reasonably good, and what information is not (Kessels, 1996; Bolhuis, 2003). To keep up with the pace of change, some colleges and universities have revised their curricula by focusing on skills that students need to learn better on their own (Sharma & Monteiro, 2010). These are skills intended to help students to be more independent in gathering and evaluating information, as well as helping them to analyze, synthesize, use, and contribute to an evolving knowledge base. Quick and persistent change is anticipated to remain a hallmark of technological, intellectual, and economic development. As a consequence, students and professionals are learning to create and to adapt knowledge to novel situations, rather than to assimilate, recite, and apply a codified body of factual knowledge (cf. Marton & Booth, 1997; Marton & Tsui, 2004).

This shift in focus has been accompanied with a shift in preferred instructional methods—that is, the means by which an institution delivers new knowledge, develops new skills, and reinforces existing knowledge and skills (Sharma & Monteiro, 2010). Dialogue, teamwork, group learning, creative problem solving, discovery learning, facilitative instruction, etc., are becoming key concepts in contemporary educational and learning sciences. These concepts are often viewed as improvements on lecture-based instructional methods, particularly because of the assumed reliance on memorization and recitation encouraged by a lecture-oriented

approach. Regardless of where one falls with respect to the debate over these various modes of instruction, it is clear that facilitative, adult-oriented, and student-centered instructional models are exerting an increasing influence over contemporary theory and practice in academic institutions.

Like academic institutions, many corporate and government organizations are also emphasizing adult-focused models of education and training. Consider, for example, the future of Army training envisioned in the Army Learning Concept 2015 (TRADOC PAM 525-8-2, 20 January 2011) and its current implementation in the Army Learning Model. ALC 2015 presented a concept of Army learning that emphasized learner autonomy and responsibility, and self-direction in life-long learning and professional development, both within and outside the schoolhouse. It also endorsed a facilitative mode of instruction over more traditional lecture-based methods. While these changes grant enormous freedom to the Army learner to choose how and what he or she learns, they also confer a great deal of responsibility. Across many professions, not just the Army Profession, self-directed learning skills are viewed as critical to the current and future work force because these skills support the increased responsibility placed on the individual to direct his or her own development (see Sharma & Monteiro, 2010).

Both within the Army and in other organizations, an ability to take responsibility for learning on one's own is essential to maintaining individual expertise and mission success. It is for this reason that educators and researchers have argued that students should be trained in self-learning skills, and that young professionals enter their fields already possessing these skills (Janke, 2010). Self-learning skills are significant for both keeping up with new knowledge and sustaining life-long learning and professional development.

Likewise, with seniority comes greater independence. Senior professionals are often largely responsible for maintaining their own professional competence, and they do so by reading trade journals, conducting research, and consulting with colleagues, etc., as well as through direct professional practice. For senior professionals, the unknowns of their day-to-day practice become far more pressing concerns than acquiring facility with what is already known.

In summary, the Army has consistently emphasized the importance of supporting NCOs' life-long learning, professional development, and ability to adapt to ever-changing professional demands and mission requirements (see SMA Chandler's editorial in the NCO Journal, July 2011; also DA PAM 600-25, 2008, pg. 5-8). Gaining an understanding of NCOs' first-person experiences of and preferred approaches to self-learning helped identify the knowledge, skills, abilities, and attitudes that are critical in supporting their job-specific objectives. Based on this understanding, training and other initiatives to refine these critical self-learning skills, abilities, and attitudes may be developed.

Research Design

This research effort consisted of two phases and employed qualitative (text-based) and quantitative (measurement-based) approaches. We first collected interview data in focus groups with NCOs, and then used an interpretive method to analyze the interviewer notes and session recordings (see Pollio, Graves, & Arfken, 2005). In this phase, NCOs' first-person accounts of

their self-learning experiences were collected in order to develop, verify, and elaborate a framework of NCO self-learning. This allowed us to explore situations, structure, and meanings of self-learning in depth, as they occurred within the everyday work lives of the participating NCOs.

The experiences NCOs shared with us were used to build a thematic framework to describe the NCO self-learning experience. The themes used to build the framework can be thought of as topics or ideas that came up again and again across the different accounts NCOs provided to us (Boyatzis, 1998). The thematic framework captures what many different NCOs were consistently saying about their otherwise diverse, individual experiences (Pollio, Graves, & Arfken, 2005).

This framework was further applied to develop instruments to measure NCOs' preferences for particular types of self-learning strategies and techniques (see Appendices A and B for the two versions of the instrument). We used a scenario-based instrument for this phase of the research. NCOs were asked to respond to two common scenarios by indicating the learning strategies that would be most relevant to them if they were in the described situation (Appendix B). We averaged their responses to the scenarios to derive a measure of the strategies they viewed as most relevant. This allowed us to determine their preferences as individuals and as a group, as well as to test for differences among various demographic subgroups.

In the second phase of the research, the NCO Self-Learning Strategies Questionnaire was used to collect data from Noncommissioned Officer Academy's (NCOAs) throughout the Army to identify the self-learning strategies preferred overall by NCOs, and with respect to particular demographic characteristics. In this phase, we were able to explore the breadth of the phenomenon of self-learning among participating NCOs and to develop a more nuanced understanding of these NCOs' preferences for different types of learning strategies/techniques. Figure 2 summarizes the flow of our research process.

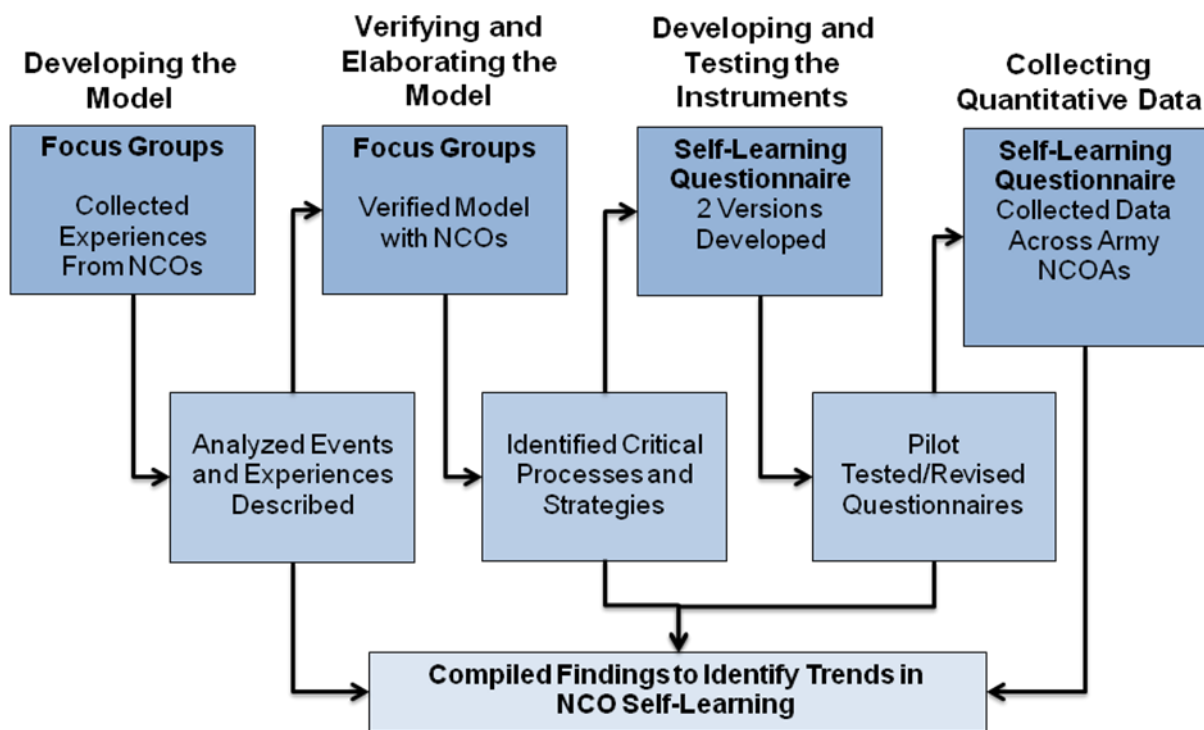


Figure 2. Flow Diagram of the Research Process

Phase I: Thematic Analysis of NCO Self-Learning Experiences

Method

Focus group data collections were conducted at two Army NCOAs on two occasions, approximately 1.5 months apart, during February and March of 2011. Information collected in the first set of data collections in February 2011 was analyzed and used to inform the topics addressed in the follow-on data collections in March 2011. Different groups of NCOs were interviewed in the separate rounds of focus groups.

In the focus group sessions, NCOs were asked to provide first-person accounts of experiences they have had taking responsibility on their own to learn a job-related concept, task, or skill in order to become more able to do a current and/or anticipated future job. The research team asked additional questions during the focus group interviews to collect information on specific aspects of the NCOs' experiences, such as barriers they encountered in the self-learning process and what core competencies they viewed as amenable to self-learning. The key information elicited in the first set of focus group interviews focused on:

- Situations in which participants learned something on their own to improve their performance at work or further their career, etc.

- Situations in which participants wanted to learn something for work but were not able to complete what they set out to do.
- Something participants would like to (or need to) learn on their own at this point in their careers to enhance their performance at work.

In the second set of focus group interviews, questions were asked to follow up on emerging findings from the first set of focus groups. The second set of focus groups was also used to collect additional examples of NCO self-learning to be used in drafting materials for the Self-Learning Strategies eHandbook. See Appendices C and D for the interview protocols.

The research team structured the data collection and data analyses using a blend of qualitative research methods. The data collection, analysis, and follow-on interview process were conducted in accordance with the constant comparative technique common in Grounded Theory (see Charmaz, 2000). We analyzed the interview notes and session recordings for consistent themes using content analysis (Creswell, 1998) and hermeneutic methods (Pollio, Graves, & Arken, 2005; Graves et al., 2010). Content analysis techniques focused on documenting particular words and phrases that came up frequently across the interviews; hermeneutic techniques focused on categorizing these common words and phrases in terms of their similarity in meaning. Finally, narrative analysis techniques were used to analyze the transcripts for temporal structure, i.e., the logical sequence of events communicated in the NCOs' first-person accounts (cf. Riessman, 1993).

Participants

In total, $N=123$ (28 females) Army NCOs participated in 40 focus groups conducted at two NCOAs: the Army Logistics University, Fort Lee, VA, and the 3rd Battalion, 166th Regiment, Fort Indiantown Gap, PA. Each of the 40 focus groups consisted of 2 to 6 NCOs, with the group size varying in terms of participants' availability. Table 1 describes the demographic characteristics of the group (see Appendix E for the demographic instrument).

Table 1
Demographic Characteristics of the Focus Group Sample

Characteristic		%	n
Rank	Specialist / Corporal (E-4)	2.5	3
	Sergeant (E-5)	17.4	21
	Staff Sergeant (E-6)	38.0	46
	Sergeant First Class (E-7)	28.1	34
	First Sergeant / Master Sergeant (E-8)	14.0	17
	Sergeant Major / Command Sergeant Major (E-9)	--	--
Gender	Male	76.9	93
	Female	23.1	28

Table 1
Demographic Characteristics of the Focus Group Sample (continued)

Characteristic		%	n
Civilian Education			
	Some High School	--	--
	High School Diploma or GED	6.6	8
	Some College	68.0	83
	Bachelors Degree	13.9	17
	Some Graduate School	4.9	6
	Masters or Doctorate	6.6	8
Component			
	Active Duty*	54.5	67
	Army Reserve	4.9	6
	National Guard	40.7	50
Career Management Field			
	Maneuvers, Fires, and Effects (Combat Arms)	30.1	37
	Operations Support (Combat Support)	24.4	30
	Force Sustainment (Combat Service Support)	45.5	56
Career Intentions			
	Definitely leave after current obligation	1.6	2
	Probably leave after current obligation	0.8	1
	Probably stay beyond current obligation	4.9	6
	Definitely stay beyond current obligation	4.9	6
	Probably stay until retirement	11.4	14
	Definitely stay until retirement	76.4	94

*Note: This includes $n=5$ NCOs who self-identified as Active Duty/National Guard.

Ages ranged from 21yrs to 55yrs, with a mean age of 35.4yrs. The mean time in service for the sample was 14.4yrs (range=3.5yrs to 31.5yrs). Most NCO ranks were represented, with the exception of Sergeant Major (SGM) and Command Sergeant Major (CSM). Most NCOs in the sample had some college education and a quarter of the group had completed a bachelors or higher degree. A small percentage had completed high school/General Equivalency Diploma (GED), but had not yet attended college.

NCOs in the sample represented fifteen different military occupational specialties (MOS) series, including Maneuver, Fires, and Effects (also Combat Arms), Operations Support (also Combat Support), and Force Sustainment (also Combat Service Support). The sample was slightly more representative of active duty NCOs compared to National Guard/Reserve NCOs. A majority of the NCOs interviewed indicated that they intended to stay in the Army until retirement. Smaller percentages indicated that they would probably stay to retirement or that they had other career intentions.

Sampling Procedures

To recruit participants for the focus groups, we asked the Commandants of the participating NCOAs to identify NCOs who they felt showed a clear ability to learn successfully

on their own. The Commandants and their staff were asked to select equal numbers of successful NCOs from the ranks of Sergeant (SGT), Staff Sergeant (SSG), and Sergeant First Class (SFC), as well as to identify Master Sergeants/First Sergeants (MSG/1SGs)⁸ for us to interview. Our pool of potential participants consisted of NCOA students and instructors, as well as NCOA staff. Given that we intended to collect accounts of experiences of self-learning from successful NCOs, we also needed to identify a pool of participants who have had these types of experiences in a variety of Army settings.

While this sampling methodology may seem unconventional from the perspective of statistical analysis, in which random sampling is the ideal, it is important to understand that in this stage of the research we intended to generalize to self-learning experiences among high-performing NCOs, and not to generalize a statistical effect to a larger population (Pollio, Henley, & Thompson, 1997). This intent called for a selective sampling strategy focused on a group of NCOs most likely to have had success with self-learning on the job and to ensure that diverse and high quality learning experiences would be described by the NCOs we interviewed (cf. Graves et al., 2010).

Data Collection Procedures

For most focus group sessions, three to four interviewers were present. The interviewers included two research psychologists (one each from ARI and PDRI), an educational researcher/retired Army MSG from INCOPD, and a retired Army MSG from Reservoir International. Typically, 2 to 6 NCOs were present for each focus group session. The focus groups were conducted in a classroom at the NCOA, with interviewers and NCOs seated comfortably around a table. Each focus group interview lasted for approximately 1.5 hours.

At the start of each session, the research team briefed potential participants concerning the intent of the research, what products will result from the research, the NCOs' rights as participants in research, and standard limits to confidentiality. With the permission of all participants in a session, the interviews were recorded digitally to verify the accuracy of written notes before the researchers began their analysis of the notes. In three of the forty sessions, at least one NCO declined to allow recording, but still consented to participate; we honored all requests to not audio record the session, instead relying on written notes. After the first few sessions, the researchers noted that self-learning was often being associated with and limited to computer-based training. In subsequent interviews, the researchers modified their introduction to qualify that computer-based training can be an example of a way that a person conducts self-learning, but that self-learning encompasses a much broader range of activities. We did not directly specify or focus on any single learning activity for the participants.

During the focus group sessions, the interviewers worked through the interview protocol, addressing topics relevant to self-learning. They also asked open-ended follow-up questions to clarify points or gain a better understanding of the NCOs' perspectives. During the focus

⁸ Master Sergeants and First Sergeants were interviewed together as both are the same enlisted grade (E-8), with the difference between them being the particular functional role they have within their units. Master Sergeants tend to focus on their area of technical expertise whereas First Sergeants tend to be in a leadership role, working alongside a commissioned officer as part of a unit command team.

groups, one interviewer took the lead to keep the interview process on track. The remaining interviewers took notes and asked follow-up questions, if needed.

As described earlier, the focus groups were conducted during two separate rounds of data collections. The first rounds of interviews focused NCOs on their experiences of self-learning (see Appendix C for interview protocol). After the data from the first round of interviews was analyzed and a follow-on round of focus group interviews was conducted to explore our working framework of self-learning in greater depth (see Appendix D for the interview protocol).

Results: Self-Learning Situations and Themes

During the focus group interviews, the NCOs described a variety of situations in which they engaged in self-learning. We categorized the critical learning situations described in these interviews as: (a) enhancing existing skills and acquiring skills for new jobs/assignments, (b) building skills for leader roles or promotions, and (c) pursuing personal development/achievement. Table 2 provides a summary of these categorized critical learning situations paired with specific examples from the NCOs' discussions.

Table 2
Critical Learning Situations in which NCOs Described Being Engaged in Self-Learning

Category	Situation	Example
Enhancing Existing Skills and Acquiring Skills for New Jobs/Assignments		
	Learning to write and present information	Writing NCO Evaluation Reports; awards; Operations Orders; memos; preparing a decision brief; sales techniques to be a recruiter
	Figuring out procedures and requirements	Managing a Battalion level deployment, without a right seat ride; managing convoy operations for the first time; learning riot control; managing a postal contract
	Learning new MOS skills; refreshing old MOS skills	Getting up to speed on essential job tasks of subordinates; learning music theory
	Getting hands-on training with new equipment	Obtaining the manual and trying out different procedures; learning the Long Range Advanced Scout Surveillance System; practice administering an IV
	Developing proficiency with Army software systems	Learning to use the Defense Travel System; Human Resources computer systems

Table 2
Critical Learning Situations in which NCOs Described Being Engaged in Self-Learning
(continued)

Category	Situation	Example
Building Skills for Leader Roles or Promotions		
	Learning about others in order to lead	Testing influence strategies; identifying and utilizing skill sets of Soldiers; counseling Soldiers
	Preparing to teach a new course/topic	Seeking help from engineers to make sure knowledge of demolitions was up to speed
	Learning effective public speaking techniques	Taking a public speaking course at a community college
	Preparing to demonstrate/perform a skill for an audience	Getting back up to speed on leading Soldiers in Drill & Ceremony for a best NCO competition
Pursuing Personal Development/Achievement		
	Improving physical training of self and subordinates	Researching, experimenting, and developing a tailored exercise program
	Developing digital literacy	Conducting online searches, using typing training programs, such as Mavis Beacon
	Learning foreign languages, customs, and cultures prior to a deployment	Talking to returning Soldiers and researching online and in library, using language learning software programs and CDs

The category structure for the situations presented in Table 2 is based on discussions among the researchers following independent data analysis, reaching consensus concerning categories and labels. A small number of accounts did not directly fit the structure illustrated in Table 2, but are worth mentioning. One NCO described building his expertise in competitive bass fishing. During the interview, this at first seemed off topic. However, the NCO did go on to note that the experience allowed him to learn how to gauge the depth and breadth of knowledge and practical understanding required to be an ‘expert’ at something. From his awareness of what it ‘feels like to be an expert,’ he claimed that he was better able to develop his expertise as an NCO. His ability to build his expertise in bass fishing served to help him develop a more abstract concept for developing knowledge and ability in other domains.⁹ As head chef, another NCO described his passion for trying out new recipes with his family. He was able to maintain and further hone his work-related skills at home, with successful techniques being applied to his work supervising Soldiers and other NCOs in a dining facility.

⁹ In future research, it may be of benefit to the Army to consider exploring the hobbies and personal interests of military professionals in relation to knowledge and skills that, while developed and honed on personal time, are utilized to improve their work with the Army.

The diverse accounts we documented were analyzed for consistent meanings in order to develop a framework of NCOs' self-learning experiences. Figure 3 presents a framework of the central themes that were present across the NCOs accounts of their self-learning experiences.

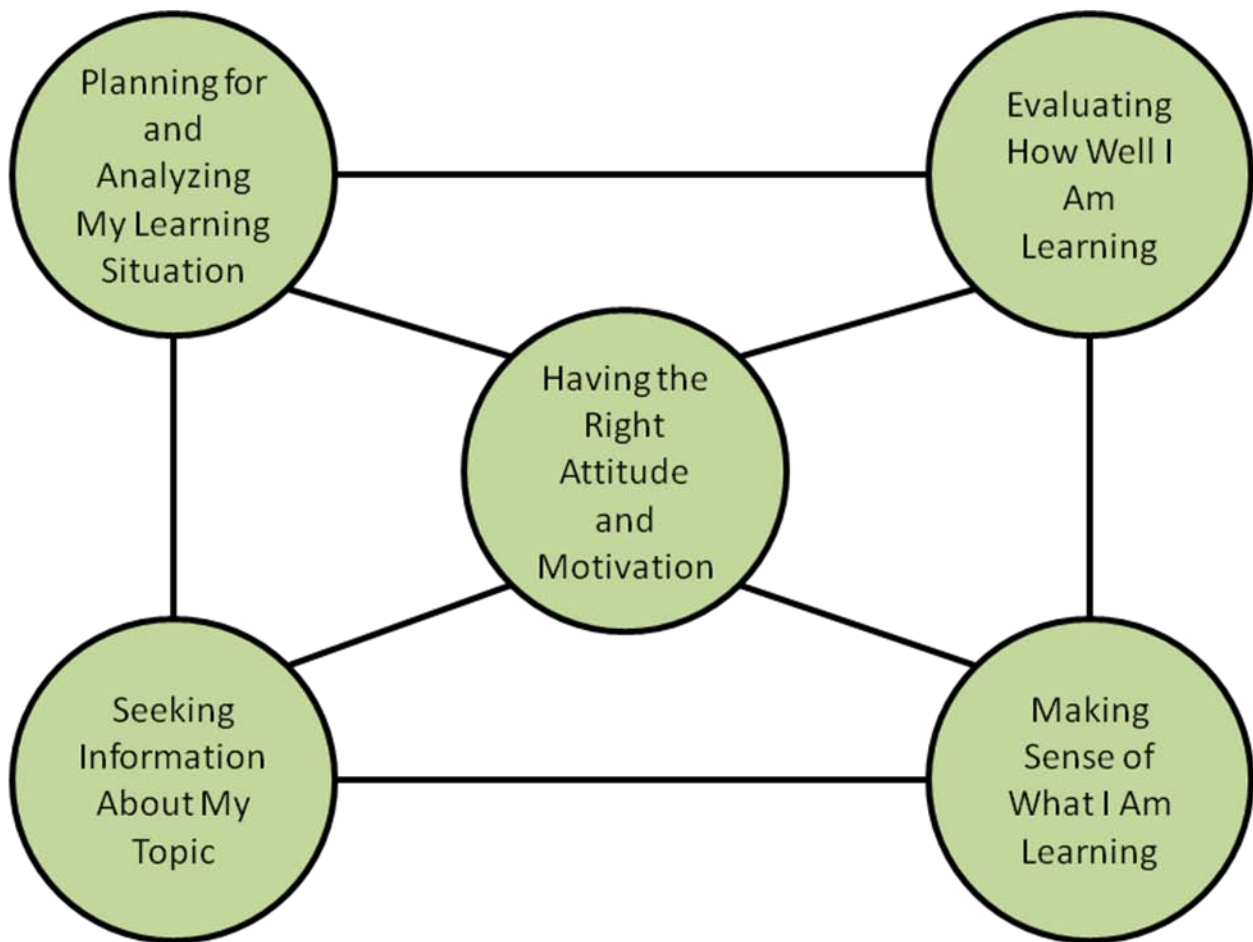


Figure 3. Thematic Framework of NCO Self-Learning

Within the green circles in Figure 3 are descriptions that summarize each central meaning that came up repeatedly across the accounts, i.e., *themes*. The circles that encapsulate each theme are joined with lines to indicate that the accounts provided by NCOs were not linear, as in a 'first I did this, and then I did this' type of structure. NCOs would sometimes jump between topics and themes during the interviews, often echoing or arguing with each other's points. A general, logical flow did seem to emerge, however, which indicated that aspects of the self-learning process might be linear while the overall process seemed iterative and non-linear.

It is important to note from a psychological perspective that when people talk about their first-person experiences, the events they describe inform us about the ways in which they perceived salient aspects of their experience (James, 1890). People tend to talk about the things that are important to them, the things about their experience that stood out to them and that they paid attention to. People also tend to recall events in terms of a 'psychological present,' a group activities that are perceived to be related, given that they have a common focus toward some goal

or purpose (James, 1890). The method used here allows us to identify consistent patterns of meanings across different participants' descriptions of a type of experience in order to understand its salient characteristics (Pollio, Graves, & Arfken, 2005).

All stories require a setting or a context to make sense (Riessman, 1993). Across the accounts of their self-learning experiences, almost all the participating NCOs described their Army jobs and responsibilities as the setting or context for their accounts. Many also provided their rationale for engaging in self-learning and described the particular work environment they were in when they had their experiences. The work environments described were diverse, ranging from a convoy mission in Iraq, a National Guard aircraft hangar, an Army hospital, to a stateside dining facility. Moreover, the NCOs often provided details about what they enjoyed about their work, and what they could do without—such as time constraints or being overwhelmed with too many taskings coming from Headquarters.

All took pride in their leadership abilities and the opportunities they had to provide skillful supervision to their Soldiers, and to support and advise officers and other NCOs. They described their concerns about issues surrounding promotions, getting the right schoolhouse courses at the right times, emerging trends in Army training, and occasional frustrations at work. Overall, the majority described very positive work environments that were supportive of their efforts to learn on their own.

By identifying the consistent themes that stood out across the NCOs' diverse descriptions, we were better able to make sense of what it was like for NCOs to learn on their own within their unique professional context, and to understand what motivated their decisions, guided their actions, and so on. The method we used allowed us to generalize our findings just enough to inform a set of conclusions, without losing fidelity to the professional context in which NCOs live and work.

Theme 1: Having the Right Attitude and Motivation

The NCOs described particular beliefs and needs that initiated and supported their self-learning activities. The first theme, Having the Right Attitudes and Motivations, focused on individual characteristics, that while not directly related to a particular self-learning experience, tended to encourage NCOs to engage in self-learning in the first place. This theme was often an aspect of how the NCOs viewed themselves professionally as well as their role in the Army. In relation to this theme, there were three related subthemes: (a) Needing to Know, (b) Reaching Out to Others to Develop as an NCO, and (c) Taking Initiative to Solve Problems.

Subtheme 1.a: Needing to Know

Many NCOs noted that their self-learning was often motivated by acknowledging that they needed to know something they did not currently know. This was often framed as a gap in their knowledge, skills, or abilities. Some examples:

- When others have confidence in you, *you can't say "I don't know how to do this..."* People are dependent on you and *you need to maintain proficiency.*

- As an NCO, *it's your duty to know... If you don't know something* when a Soldier asks, you start defacing yourself....you have to be able to learn and to teach.
- The *most rewarding and frustrating part of my career* so far was my deployment as a combat leader. *Through a lot of head-banging, I had to realize* what the strengths of my people were and *how to use their civilian as well as military skills to improve the performance of my unit.* You'd think that one of the big take-away lessons from going to war would be how not to get holes put in you that you didn't already have when you got there; for me, *it took a stressful event like that to learn to recognize the strengths of my people.*

Subtheme 1.b: Willingness to Reach Out to Others to Develop as an NCO

The NCOs noted that in recognizing a gap in their knowledge, skills, and abilities, it was also important to be able to acknowledge this deficit and to reach out to others for assistance. Taking the initiative to fill in gaps and to develop their expertise was central to this subtheme, with NCOs stating “let the hungry go out and get it.” Some examples:

- If you don't know, that means a lot of other people don't know either. *The danger is being too HOOAH and not seeking help. You have to be honest with yourself about what you don't know.*
- *Remember problems from your past and improve yourself.* When you become an NCO, *you had never been an NCO. You grow from talking to your Soldiers. You need feedback to grow.*

The lesson the NCOs seemed to be articulating is that while you may be learning *on your own*, you are not learning *alone*. The NCOs described reaching out to other Soldiers, NCOs, and officers to gain knowledge and the benefits of others' experiences and expertise.

Subtheme 1.c: Taking Initiative to Solve Problems

In recognizing a gap or need, these NCOs noted that to be effective self-learners they had to take the initiative to solve problems. Most of the experiences they described were not situations in which they were freely learning—for example, surfing the web or browsing in the library out of pure curiosity. More often, they described situations in which they had a concrete work-related problem to solve, and they tended to frame their self-learning experiences in terms of problem solving.

- Work to *empower people to make guided solutions to problems, giving people options.* You don't need a fear factor to motivate; *you need to develop thinkers who can solve problems.*
- When my NCOs come to me with a problem, *I tell them don't come to me with a problem, come to me with a solution....It's important to get others to think for themselves....force them to track down the solution;* read the Regs, and then get guidance....being a self-starter is important.

The overall Attitudes and Motivations theme concerns coming to view one's self as a competent professional, who can use both successes and failures as opportunities to learn, and

who understands the learning process as developing over time and requiring strong relationships with others.

Theme 2: Planning and Analyzing My Learning Situation

The Planning and Analyzing theme tends to be the most sequential in structure in that it is focused on how the NCOs' self-learning processes unfold over time, particularly with respect to planning, executing, and tracking progress. Its focus is more on the learning event itself, rather than on the individual learner as in the Attitudes and Motivations theme. As the NCOs described analyzing their learning situation into parts and then figuring out how they wanted to approach their learning process, four subthemes emerged: (a) What Do I Need to Learn?, (b) What Do I Anticipate for the Learning Process?, (c) What are the Goals?, and (d) How Should I Establish Priorities for Tasks and Topics?

Subtheme 2.a: What Do I Need to Learn?

The NCOs described identifying what, in particular, they needed to learn in their assigned position. Two examples from the focus group interviews illustrating this subtheme are:

- I was the Quality Assurance NCO; new job, no training, no SOP. I reached out to the proponent agencies.... *I had to figure out the measurables...had to develop my own measures and accountabilities, which expanded into many different areas of responsibility.*
- I am motivated to learn *survivalist stuff...How did people do the things they did 100 years ago?* It's not necessary for my job, but it is useful...*The basic stuff is gone; we need to teach people what to do when the computer goes down—it's like the way map reading skills have declined with GPS. Technology is great, but you got to keep the basics for the military...People who know the old skills are retiring.*

Subtheme 2.b: What Do I Anticipate for the Learning Process?

In the work context of NCOs, many priorities and the needs of other Soldiers, NCOs, and officers can impinge on their learning tasks. In addition, NCOs must balance their responsibilities to the Army with their family lives. This subtheme concerns how NCOs scope their learning task and identify potential conflicts that may come up during the learning process. The central focus of this subtheme is managing competing demands (e.g., work/family life conflict, multiple taskings).

- *Time management becomes more important. I make sure I spend quality time at home and that my family supports what I am doing. Time management is something that I learned through different phases in my life, especially using backwards planning and maintaining and analyzing time charts of activities—it allows you to learn to plan and predict time allocated to particular tasks...I can take an additional task, but here is the cost.*
- *Having a set time-line; a defined take-away...setting a defined schedule helps fight procrastination. A time-line helps create stress to meet goals...I want to know how I did now, so I can adjust my plans.*

- Make sure your goals *meet the realities of your life and your schedule*. If you have three kids, going to the gym is not going to happen as often as you want.

Subtheme 2.c: What are the Goals?

Many NCOs described working to establish clear goals for their learning process, and using these goals to plan a route through the self-learning process. Similar to the way the NCO quoted above described using backwards planning to address potential scheduling conflicts, many NCOs we talked to reported that by establishing what they hoped to accomplish, they were able to plan more effectively their learning activities and schedule around concrete goals.

- *What are your goals? You have to identify the knowns and unknowns and what has to happen to reach these goals...what do you want to have happen? Where are you now...that's what you know...then you work from what you know to get to the unknowns.*
- *Most highly motivated Soldiers set goals for themselves. They are goal-oriented. Once they set goals, they are systematic in working toward their goal.*
- *Learning from others' stories how they worked around a situation, you get a good concept of a final goal and how to get there. With a good starting point and good ending point, it becomes a matter of figuring out a variety of ways to get to the end point.*

When taken together, these subthemes (2.a through 2.c) illustrate how NCOs described planning their overall learning process, at least at the outset. It is important to note here that the plan an NCO may initially create for a self-learning project should be open to being modified, given unplanned changing circumstances in work or home life. For many NCOs, it was hard to find time to execute a self-learning project quickly if the project was not organized around a specific tasking or job requirement that imposed an external deadline on the learning process.

Subtheme 2.d: Establishing Priorities for Tasks and Topics

NCOs also described establishing a path through the self-learning project by prioritizing tasks and topics and indentifying the most essential things that needed to be accomplished in order to achieve the goal. The basic meaning of this subtheme concerns how NCOs focus their self-learning efforts for maximum payoff, given competing demands on their time. Some examples:

- *Get smart by learning the overall process. Don't spend time in the weeds if it's not going to help you.*
- *I will always be hit with new tasks, so I needed a process for keeping track. Breaking problems into simple parts and figuring out who I can get to assist me. Then, I prioritize—what's going to have to give? If loss of life, limb, or harm are possible, that's at the top of the list, then I work from there.*
- *Figure out the baseline steps—the milestones—get guidance. You need to establish expectations short term (3 to 6 months), set goals, align with supervisors, and set a navigation plan....you need to prioritize, otherwise the important stuff can't get done because*

of all the little stuff. As you move up, you have more freedom, so the onus is on you to become a better planner.

Some NCOs described creating schedules, trackers, spreadsheets, etc., to work through their self-learning process, using software like excel, or using a word document to maintain a checklist and summary of what they had learned and what they intended to do next in the process. Other NCOs described “diving in” and “just doing it” without focused upfront planning and prioritizing.

Note that a logical sequence seems to emerge with respect to this theme, as problems are broken down, goals and priorities set, and deadlines established. That said, however, an NCO learner might return to and revise goals, priorities, etc., along the way, given changing circumstances in his or her work and home life. A schedule/checklist for a self-learning project is the result of planning and analyzing what is anticipated for a learning situation. It is open to revision given continuing change in that learning situation and development in the self-learning NCOs’ understanding.

Theme 3: Seeking Information about My Topic

NCOs described how they identified, collected, and used information. Information came by way of published learning materials and resources, access to equipment, online sources, and other people. Four subthemes seemed to be consistently related to this overarching theme: (a) I’m the Kind of Person Who Learns from Doing, (b) Show Me What Right Looks Like, (c) Using Personal Experiences and Examples, and (d) Getting to the Latest and/or Best Information.

Subtheme 3.a: I Like to Learn Hands-On

NCOs largely described themselves as “hands-on learners,” and tended to view the Army in a similar way, as a “hands-on learning organization.” These NCOs described preferring to learn in situations in which they could actually use the equipment, execute the procedure, etc., rather than just reading about it. Consider the following examples:

- I’m not a big classroom person. *I like to learn hands-on...give me the equipment and let me figure it out.*
- We would be *trading problems among SGTs*—trouble shooting—we’d *work with offline equipment and get it working*; “what would you do if...?” It was a problem solving drill to stay fresh.
- I asked people *if I could do IVs on them (the OPNs and RNs) to give feedback*—before I was going to do it on the patients.

Subtheme 3.b: Show Me What Right Looks Like

NCOs described seeking out examples that would show them how to do what they needed to do. Consider for example the ways that information papers or briefings serve as

models to create new information papers or briefings. Continuity books are another example of this type of information. Some examples:

- *99% of us are Show-Me Soldiers...the job really is showing Soldiers how to apply these things.*
- *What is the outcome or path? You look for exemplars. You rely on the older generation—who has done it.*
- *I keep materials saved and developed a template to work from—you need to know what something is supposed to look like. You learn from other people's examples and the more you do it, you begin to catch things.*

Some NCOs described sharing information and examples with other Officers, NCOs, and Soldiers, including examples of completed work, such as NCO evaluation reports, briefings, or operations orders. The sharing of exemplars typically takes place by way of email, unit share drives, read/write compact disks, hard copy and digital continuity books, as well as face-to-face discussions, etc.

Subtheme 3.c: Using Personal Experiences and Examples

Personal experience was given high priority by the NCOs. NCOs described why and how they use their own and others' experiences and examples as a critical learning resource:

- *My biggest resource is other members of the Army. Seeking out people with the experience—a lot of information that is online is no longer relevant.*
- *Trial and error...passing down information. Someone is going to know something; each person is learning a piece and integrating what they know.*
- *I pool information and compare examples. Which one makes the most sense? Which one contains the most information? Each unit may do it differently...I need to look at multiple examples....the small details come out of feedback from people who have done it before.*

Subtheme 3.d: Getting to the Information I Need

NCOs also described relying on different sources for different types of information. For formal Army knowledge, they often went to the field manuals, technical manuals, and regulations, etc. To answer a quick question, they would use search engines to seek information online, one NCO reporting, "you'd be surprised what you can find online." Other valued information sources were the Center for Army Lessons Learned (CALL) website, AKO, etc., although a common complaint concerned the difficulty of navigating through Army information resources to find the needed information. NCOs described identifying potential sources and culling resources to focus on what they needed.

- *Internet information can be limited; some [Soldiers] miss that there is other information...The Army needs to offer Civilian knowledge to personnel. Soldiers need access to complex research literature.*

- *I find the Reg, and if I can't find the Reg, then I go to an expert. There are people in other departments that I keep as a point of contact. I create binders, so when the next person takes over, they will be up to speed faster...when I am forming the binder, I am learning it myself.*
- *I always keep a set of my own manuals and a full set of books for what is being taught. Always have a contingency plan...the [online] site is inconsistent, but the need for knowledge remains. I need my own set of manuals.*

A very significant selection criterion was the currency of the information. NCOs mentioned evaluating resources in terms of whether they are current, noting that some military-themed websites on the civilian side of the internet provide very dated or incorrect information. Crosschecking resources and talking to other Army personnel was a useful way to identify inconsistencies across sources and to evaluate the accuracy and usefulness of a source.

- The _____ training *hasn't been updated in a long time.* People are still wearing BDUs and we still have VHS tapes floating around.

While the internet was a major resource for information, NCOs were not always sure they could trust the information they were gathering. Multiple sources were often compared against each other when NCOs felt it was necessary, for example, when encountering conflicting descriptions of how to complete a task.

A source may be used because it is succinct, detailed, and/or convenient. One NCO described how he decided on a language-learning tool: he needed something he could listen to on CD and practice during his daily commute. While this was not the language-learning tool that is provided free through Army Knowledge Online, he needed something he could use at his own convenience, in his only real free time: a 45 minute commute to and from work.

In some cases, NCOs described elaborate systems for organizing and sharing the materials and resources they collected. Documenting lessons learned in notebooks, computer files, or developing a 'Continuity Book' to help other NCOs were all described as useful working strategies. One NCO reported writing up her notes and emailing to other NCOs in a similar position to her own in order to get their feedback and additions. Keeping good information to one's self seemed to be frowned on by the NCOs we interviewed. The attitude expressed was that by sharing the best information, everyone would benefit.

When NCOs described seeking out and sharing examples of work products (e.g., Noncommissioned Officer Evaluation Reports (NCOERs) or briefing slides) with other NCOs, they described comparing examples to look for consistent patterns: 'What seems to work and what doesn't?' 'What is acceptable for me to do to complete this task, what isn't?' One NCO talked about how lucky he was when he arrived in theater to have had a job that allowed him to access the share drive for the unit. He collected examples of command briefings other NCOs had developed and modeled his own command briefings on those examples.

Some NCOs reported keeping detailed notes on what sources they had consulted, what those sources had to say, and whether the information was useful. Good sources were often shared with other NCOs.

Theme 4: Making Sense of What I Am Learning

Some NCOs described how they attempted to make sense of what and how they were learning. In the scientific literature, topics related to this theme are often described in terms of ‘metacognition,’ which can be described as ‘thinking about *thinking*’ (Metcalf & Shimamura, 1994). Subthemes associated with the *Sensemaking* theme include (a) Being Aware of My Thinking, (b) Knowing What to do When I Don’t Understand, (c) Verifying What I Know, and (d) Making What I Am Learning My Own.

Subtheme 4.a: Being Aware of My Thinking

Some NCOs described being ‘mindful’ or ‘being aware’ of what/how they were thinking concerning a problem, a piece of information, or a learning task, etc. Typically, this subtheme emerged with respect to difficulties NCOs encountered with their thinking process, a failure to understand making them aware of the ways in which they were trying to think something through.

- I was trying to figure out the younger generation, and I used to put myself in that category, but *then I realized there are a lot of things I don’t know* about how to understand them...*it wasn’t making much sense to me.*
- Use outlining to *figure out how to put everything together...figure out what you don’t know based on what you do know*, then you fill in the blank...what you don’t know.
- Use *imagery to imagine what you are going to do, how you are going to do it...for Squad Drills, Drill & Ceremony, etc., I know every step, I use imagery to know what I need to do before I execute—I quiz myself—where do I go from here?*
- A person’s *background shapes the way they learn*: their life experiences, initiative to learn on their own, ability to learn from mistakes.

Subtheme 4.b: Knowing What to do When I Don’t Understand

NCOs described being aware of changing up their approaches, strategies, or learning techniques to address problems that emerged in the learning process.¹⁰ Some examples:

- *Online can be so boring*, like with [software program]....*I like to change it up...change gears.*

¹⁰ This subtheme seemed to be related to a branch of philosophy and social sciences called hermeneutics. Hermeneutics is the study of how human beings interpret events, texts, symbolic systems, etc., and develop understanding from them, as well as an area of research (alongside traditional cognitive psychology) on what techniques may prove helpful when one fails to understand something.

- I use a hands-on approach and *whiteboard stuff to figure it out*. I figured out different NCOPD strategies using a whiteboard to map out the process.
- I wanted to learn but got stuck, so I fell back on Army regs. With 10 people and 10 answers, it's terrible to read the Army Regs, but they have the answer. You can't get broad knowledge from them because they are so difficult to read. I focus in on what is needed.
- You can create a mnemonic to help remember, or develop an acronym, or flashcards, or rehearse—put it on paper and then do it—you get the stress of doing it.
- Working from simple to complex...I first work out the basics with new equipment.
- Sometimes you need to slow down. When you put it into practice, you need self-awareness of what is happening with learning and ability.

Subtheme 4.c: Challenging/Verifying What I Know/Believe

NCOs described assumptions and beliefs that influenced how they approached their learning situation, and how they would seek to challenge their beliefs and understandings. This subtheme concerns exploring alternatives and possibilities in what is known about a topic, and a way that NCOs described making up their own mind about various knowledge domains.

- Bring together people with different backgrounds and you get new sets of eyes, an outside perspective.
- I explored Iraqi culture in the library and learned some of the language. I didn't want to go in with negative biases.
- You need to keep up. The future includes a lot of stuff and you need to know where to go to find the information.

Subtheme 4.d: Making What I Am Learning My Own

Finally, NCOs described how they took what they had learned and applied it to their own life experiences, used what they learned to change how they were approaching some situation, and/or to create a new outcome or to produce some deliverable/product on their own. Some examples:

- I watched others in charge and took the characteristics of some leaders and blended them together. I was picking up techniques that work.
- Break it down to the basics and establish a good foundation. If the foundation is set right, you can go ahead and build to accomplish the bigger task. A barrier to self-learning is multiple taskings, and inconsistencies in how things should be versus how they are done. When there's confusion from conflicting sources, you have to decide.
- Figure out what it is you need to learn to be successful at your job...figure out your weakness and then continue with that. If I want to write a better NCOER, I can take a great situation

and see if I can create and NCOER from it, take a Bronze Star write-up and write an NCOER based on it.

Theme 5: Evaluating How Well I Am Learning

Given the constraints under which Army NCOs are typically working, the NCOs we interviewed frequently expressed a need to check their self-learning progress and outcomes. Three subthemes tended to be associated with how NCOs evaluated their self-learning efforts: (a) Relying on the NCO Network, (b) Did I Meet My Goals and/or Accomplish My Task?, and (c) Can I Teach Others What I Have Learned?

Subtheme 5.a: Relying on the NCO Network

NCOs very often described relying on feedback from other NCOs, officers, and Soldiers to find out how well they were doing.

- *I had to work it through with another NCO that I trust. Fuel can be highly explosive, and you have to be careful with it. The TM [technical manual] will tell you what to do and higher leadership will be checking to tell you what you're doing right and what you're doing wrong.*
- *When learning the Army writing style, my initial strategy was to move quickly through this one [assignment]. I was waiting for my grade, and got together with peers. We broke it down for each paper; started comparing each other's papers.*
- *I was put in as training NCO for a Company and had to become the [software] guru. I had to generate a slide show for the weekly brief—had to be about 40 slides and to look presentable. My resource was an XO [executive officer] who was an English major. He was able to show me how to manipulate the program and I also had a share drive, so I was able to look at examples.*
- *I gave my brief to some other NCOs informally and got smoked. I've redone it three times and will brief the Commander next month. You need the evaluation of the folks in the room, making sure the Commander is given enough information through the information briefing. You need an SME to help finish the product and follow-through.*
- *If you're doing something off, you're going to hear about it from the people around you.*

Subtheme 5.b: Did I Accomplish My Goals and/or Complete My Task?

NCOs described evaluating their progress in terms of whether they met the goals they established at the outset of the project. If an NCO was still involved in the self-learning project they chose to describe, the question concerned how well they were meeting milestones along the way.

- *Had to do it on my own because Army recipes can be limited, so I taught myself from books on baking and cooking on my own. You keep trying things until you get it right, making food for my family, three and four course meals...I learned baking from trial and error....The CSM recommended culinary competitions. They only take 15 cooks in the Competition. The*

top five Army Chefs are Certified Master Chefs, and usually a Warrant Officer is the Top Chef. *I participated in the Competition and got ___ place.*

- I had never led a convoy before and was asking a lot of questions. I had a lead driver who knew the area well. We made a couple wrong turns and another MP unit escorted us out of the area...*we made it to the end point with no injuries.* We should have added some checkpoints. I never would have made the wrong turns if I had been communicating with higher....*on the convoys I led afterward...I knew the routes, knew what to say...it did get better.*
- *I learned from making mistakes and seeing what the consequences can be; there are probably more bad examples than good.*

Subtheme 5.c: Can I Explain/Teach Others What I Have Learned?

NCOs described testing their new understanding by teaching others what they had learned.

- I identify a gap, then ask ‘how do I fill it?’ *I talk to other instructors because I need to know I know it; I can’t pitch it if I don’t know it....* When you figure out how to do something on your own, you’ll never forget it.
- As an NCO, you have to lead the Soldiers. You have to get back with the Soldiers, you help the Soldiers and don’t lose their respect, *be able to answer their questions.* Being allowed to figure things out for yourself, *but also teaching...teaching Soldiers helps me to learn it again and again.*
- *I never want to stand in front of a group and not know what I am talking about.*

In summary, NCOs described whether they were successful in achieving the goals they set or whether they were still working toward them. Checking to see that they were meeting milestones was a major way in which NCOs evaluated their learning process: they focused on whether they were able to get done what they needed to get done.

Other ways of evaluating learning required an NCO to seek out another NCO, officer, or Soldier to provide feedback. This type of informal evaluation would help them to identify new problems to be solved and new avenues for learning, even if their overall performance was judged a success. For example, an NCO may be able to execute perfectly the movements called for by the new exercise program, but he/she may still be off with respect to the proper cadence. The NCOs described seeking feedback from other NCOs, officers, and Soldiers as critical in helping NCOs identify ways to continue to improve.

A number of NCOs, particularly those who were higher ranking, described not wanting to appear incompetent in front of subordinates. They would work hard to perfect their understanding before performing in front of subordinates. Other high-ranking NCOs pointed out that their jobs require a different set of skills than when they were junior. Many described the difficulty of maintaining the highest level of skill in a specialized area while also being in a leadership role. Some senior NCOs described relying on junior NCOs and Soldiers to teach

them how to use the latest equipment and/or apply the latest technical skills, which these NCOs and Soldiers had recently learned in the schoolhouse. Learning from junior NCOs and Soldiers helped the senior NCOs keep up to speed on what they needed to know about the critical jobs being performed by junior NCOs and Soldiers in their unit, some referring to this process as “picking it up on the fly.” They reported that while junior NCOs and Soldiers were often very responsive to their requests, these Soldiers were sometimes suspicious that they were being ‘tested’ by the high-ranking NCO.

Being thick-skinned and not letting ego get in the way, especially when receiving honest feedback, was described as a useful way to approach assessing how well a concept or task has been learned. NCOs talked about setting an example for other NCOs and Soldiers emphasizing that it is beneficial to everyone to keep your skills sharp, regardless of who you have to talk to, or get feedback from, in order to do so. In cases of failure, most NCOs reported changing their strategy, seeking additional resources and other peers with whom to discuss the problems they were having. The learning process, for these NCOs, was ongoing.

Summary Statement of the NCOs’ Experiences

A narrative analysis technique (see Riessman,1993) was used to develop a summary statement of the NCOs descriptions of their experiences. The statement is written from a first-person perspective and was crafted to capture the essential meanings communicated across the participating NCOs’ various experiences:

When I learn on my own for my Army job, I recognize that I am in a situation in which I need to complete an unfamiliar task, solve a problem, or understand a new piece of information. I begin a process of planning my approach to learning by analyzing what I have to do in order to learn, where I need to look for resources—whether these are books, the internet, other people, etc.—and what the end goal of my learning process will be. At this point, I begin searching for information. I evaluate and keep track of what I come across—as some information will be useful to me, and some will not. I also begin to apply techniques to help me to understand and to remember what I am learning. Finally, I evaluate how well I did and whether I was able to accomplish the goals I set for myself when I began the learning process. Overall, I view the learning process as part of who I am as a person and as a professional NCO. For me, my ability to learn on my own reflects an attitude I take toward my work, my fellow NCOs, and my Soldiers. I seek to improve myself and to be a resource for others—a leader in helping to develop independence of mind, problem-solving skills, and serve as a role model for leaders, fostering these qualities in others.

Self-Learning Strategies Questionnaire Development

While our thematic framework provides a comprehensive overview of the situations and meanings NCOs described with respect to their self-learning experiences, it cannot provide a more detailed picture without additional data. For instance, it does not provide much insight into the degree to which different NCOs may prefer to use particular techniques/strategies or endorse particular attitudes and motivations that support their self-learning efforts. To answer the latter

question we needed to develop a way to measure NCOs' self-learning preferences that did not currently exist in the literature.

In order to address the need for measurement, we developed two versions of the self-learning strategies questionnaire based on the thematic framework describing NCOs' self-learning experiences. We used the method outlined in Graves et al. (2010) to develop specific items for the questionnaires. Both versions of the questionnaire contained what are essentially the same items, with slightly different instructions and response options on each version. Both versions of the questionnaire were pilot tested with NCOs ($N=15$ SGTs through SFCs). Their feedback was used to revise the instruments. With such a measurement instrument, it becomes possible to identify differences among individual NCOs to provide personalized feedback as well as to compare groups of NCOs. The NCO Self-Learning Strategies Questionnaire is not a measure of intelligence or a test of learning ability. It is measuring the perceived relevance of particular learning strategies for particular job related learning situations.

The reason for developing two versions of the questionnaire was that we were concerned with whether to identify preferences based on what NCOs have done in past self-learning situations (as we did with the thematic analysis), or to focus on what they would anticipate doing in particular self-learning situations that we provide to them as hypothetical scenarios. We wanted to leave the option open for future researchers to be able to explore either of these possibilities. The version of the questionnaire presented in Appendix A asks NCOs to focus on their own experiences; the version presented in Appendix B asks NCOs to respond to hypothetical scenarios that were based on experiences described in the focus group interviews.

The version that focused on past experiences was designed to collect information systematically concerning what NCOs have actually done in the past. It asks them to recall four experiences in which they learned something on their own for their Army jobs. Following the section of the questionnaire in which NCOs recall their past experiences, and make brief notes about each experience, they are then asked whether or not they recall applying a particular self-learning technique/strategy in each of those situations. The questionnaire is scored in terms of frequency counts, with each item having a possible range from '0' (never) to '1', '2', '3' or all '4' of the experiences they recalled. There were 23 strategy/technique related items, and 8 attitude/motivation related items, with the latter items treated as a separate scale. While this format seemed effective in the pilot testing, it also seemed to require much more explanation and ongoing assistance from the researcher to complete. Many NCOs wrote more extensive and detailed responses than were required to complete the questionnaire effectively. Should an Army researcher or stakeholder use this instrument in the future, he or she should be aware that it may require a face-to-face data collection format, and may not be appropriate for online administration.

The second version of the self-learning strategies questionnaire was scenario-based, and used roughly the same items as the experience-based questionnaire. The only critical differences were minor grammatical changes to the 23 items. The 8 items related to attitudes and motivations were also treated as a separate scale on this instrument. The scenario-based questionnaire asked NCOs to rate the relevance of the various self-learning strategies/techniques to a particular scenario (i.e., 1=Not Relevant; 2=Somewhat Relevant; 3=Relevant; 4=Very

Relevant; 5=Essential). A higher rating indicates that the item being rated is perceived by the respondent to be a more relevant self-learning choice. We wrote the scenarios based on NCO experiences described in the focus group interviews, targeting specific levels of job experience in the Army. The following is an example concerning learning to write NCOERs:

You were recently promoted to SSG and assumed your new duty position as 2nd Squad Leader; 1st Platoon, Alpha Company in January. The first week of June, three NCOs were placed on a tasker from BDE to deploy to Afghanistan in support of operation New Dawn. The 1SG directed the Soldiers' leadership to conduct a change of rater NCOER due by the 2nd week of July. You had just finished the NCOs' first quarterly counseling and are now expected to produce an NCOER; you have not had any experience at writing NCOERs. You work extremely hard through the weekend to write all three NCOERs, which are due the following Monday. After completing the evaluations, you feel unsure if they are up to Army standards. After conducting a self-assessment, you determine that you need to strengthen your skills at writing NCOERs, so you can be as effective as possible in properly supporting your Soldiers.

NCO respondents were asked to read each of the scenarios and respond to the questions following each scenario, with the additional instruction to do their best to imagine themselves in the situation described. In the pilot test, NCOs seemed far more familiar with this type of format and commented for the most part on how to refine the scenarios.

Both questionnaires conclude with a scale to measure NCOs' general Attitudes and Motivations that support self-learning. Given the way that Attitudes and Motivations were defined in the thematic framework, we did not consider that the items related to this theme would vary a great deal in relation to specific scenarios, as they tended to focus more on individual characteristics.

The final version of the NCO Self-Learning Strategies Questionnaire that we administered contained two scenarios. The scenarios were designed to be familiar and plausible self-learning situations NCOs have or will likely encounter during their careers. This instrument was shortened from the four-scenario version of the questionnaire in interest of saving respondent's time and increasing response rates. This version of the instrument was designed to take approximately 15 to 25 minutes to complete, assuming an average completion time of 5 to 10 minutes per scenario, plus 5 to 10 minutes for demographic questions and self-learning attitudes/motivations questions.

For each of the scenarios presented, NCOs were asked rate how easy/difficult it was to imagine themselves in the described scenario. The response scale used was: 1=Very Easy, 2=Somewhat Easy; 3=Average; Somewhat Difficult=4; Very Difficult=5. Table 3 presents the NCOs difficulty ratings for the two scenarios.

Table 3
NCO Difficulty Ratings for the Scenarios

Scenario	Mean	SD
Learning about leadership techniques (n=1,311)	1.83	0.92
Learning to write better NCOERs (n=1,275)	2.50	1.09

The scenarios were rated in the ‘somewhat easy’ to ‘average’ range of difficulty, and were statistically different from each other, with the ‘Learning to Write NCOERs’ being slightly more difficult for NCOs to imagine being in the situation, $t(1,266) = -20.39, p=.000$. ‘Learning to Write NCOERs’ is a skill that NCOs learn as they move into the middle phase of their careers and have responsibilities for leading subordinate NCOs.

To decide on the 23 items related to strategies and motivations, one researcher developed a comprehensive list of strategies and passed these to the research team. Working together, the team collapsed these from approximately 70 items down to the 23 on the final version. The same was done to develop the 8-item Attitudes and Motivations scale. The wording of the 23 strategy/technique items and the 8 attitudes/motivations items was crafted to capture the meanings described by the thematic framework. Therefore, the NCO Self-Learning Strategies Questionnaire is an empirically grounded measurement instrument, focused on the experiences described by the NCOs we interviewed, rather than a particular academic theory of self-learning. The advantages of such an approach are that the instrument is customized for NCOs, given job-specific selection of scenarios, concepts, and wording.

Phase II: Examining NCOs’ Self-Learning Preferences

Our thematic analysis of the NCO focus group interviews allowed us to address NCO self-learning experiences in depth, but still left many unanswered questions about the distribution of preferences for particular strategies among NCOs. In other words, the thematic framework tells us about the types of situations in which NCOs engage in self-learning and what they do in these situations, but it does not tell us to what degree they prefer particular Strategies/Techniques. Again, it should be noted that the NCO Self-Learning Strategies Questionnaire was developed to address questions specifically related to measurement of NCOs’ preferences for particular types of self-learning strategies. The NCO Self-Learning Strategies Questionnaire is not a measure of intelligence or a test of learning ability. It is designed to measure the perceived relevance of particular learning strategies for particular job related learning situations.

Method

We used a shortened version of the NCO Self-Learning Strategies Questionnaire to measure NCOs preferences for particular self-learning strategies. In addition, the Questionnaire allowed us to measure Attitudes/Motivations that support self-learning. The data were analyzed

to identify patterns of preferences by Age, Time in Service, NCO Rank, Gender, Civilian Education, Duty Status (Component), Career Management Field, and Career Intentions.

Participants

Participants ($N=1,345$) were U.S. Army NCOs between the ranks of Specialist/Corporal (SPC/CPL) and Command Sergeant Major (CSM), recruited from the leadership, instructors, staff, and students at Army NCO Academies (NCOA). Table 4 describes the overall demographic characteristics of the sample.

Table 4
Overall Demographic Characteristics of the Sample

Characteristic		%	n
Rank	Specialist / Corporal (E-4)	25.7	342
	Sergeant (E-5)	25.8	344
	Staff Sergeant (E-6)	23.9	318
	Sergeant First Class (E-7)	18.5	246
	First Sergeant / Master Sergeant (E-8)	2.6	35
	Sergeant Major / Command Sergeant Major (E-9)	3.5	46
Gender	Male	88.4	1,176
	Female	11.6	155
Civilian Education	Some High School	0.7	9
	High School Diploma or GED	23.0	306
	Some College	62.1	825
	Bachelors Degree	9.2	122
	Some Graduate School	2.3	31
	Masters or Doctorate	2.6	35
Component	Active Duty	82.0	1,085
	Army Reserve	5.3	70
	National Guard	12.7	168
Career Management Field	Maneuvers, Fires, and Effects (Combat Arms)	41.9	557
	Operations Support (Combat Support)	21.9	291
	Force Sustainment (Combat Service Support)	36.1	480
Career Intentions	Definitely leave after current obligation	4.2	56
	Probably leave after current obligation	8.6	114
	Probably stay beyond current obligation	9.5	126
	Definitely stay beyond current obligation	6.9	92
	Probably stay until retirement	21.4	284
	Definitely stay until retirement	49.4	655

We conducted some additional demographic analyses. The results are presented here to give the reader a feel for the sample and its diversity. As part of these analyses, NCO Rank was tabulated by Age, by Years of Service, by Years of Service as a Percent of Age, and by Gender. The results are presented in Table 5.

Table 5
Sample Size and Characteristics Overall and by Rank

NCO Rank	% of Sample	N	Mean (SD) Age	Mean (SD) Yrs of Service	Mean (SD) Yrs of Service as a % of Age*	% Male/Female
CPL/SPC	25.7	342	25.3 (4.9)	3.8 (2.7)	15% (8%)	87/13
SGT	25.8	344	29.2 (6.3)	7.4 (3.9)	25% (9%)	85/15
SSG	23.9	318	33.0 (5.8)	11.8 (4.0)	35% (8%)	91/9
SFC	18.5	246	37.1 (5.3)	16.1 (4.9)	43% (9%)	90/10
MSG/1SG	2.6	35	41.6 (5.5)	21.2 (4.6)	51% (7%)	83/17
SGM/CSM	3.5	46	45.9 (4.9)	26.0 (4.3)	56% (5%)	93/7
Overall	100	1331	31.5 (7.7)	10.1 (6.8)	30% (14%)	88/12

*Note: This is intended to be a proxy measure for Army-related professional experience.

The majority of the sample (94%) was composed of CPL/SPCs, SGTs, SSGs, and SFCs. MSG/1SGs and SGM/CSMs also responded to the questionnaire, and composed approximately 6% of the sample. The average age of the participants was $M = 31.5$ years ($SD = 7.7$ years), with a range of 19 to 61 years. Participants had an average of $M = 10.2$ years of military service ($SD = 6.8$ years), with a range of 1 to 35 years. Given that the NCOs may have begun their military service at different points in their lives, an additional metric was calculated to represent percentage of life years in military service (Years of Military Service / Age). On average, NCOs had spent 30% ($SD = +/- 14\%$) of their total life years in military service, with a range of 3% to 65%.

As part of our demographic analysis, we also tabulated NCO Rank by Completed Civilian Education. The results are presented in Table 6.

Table 6
Percent of NCOs by Rank and Completed Civilian Education

NCO Rank	% Some HS	% GED/HS Diploma	% Some College	% Bachelors	% Some Graduate School	% Masters or Doctorate
CPL/SPC	0.9	43.8	45.6	5.9	2.6	1.2
SGT	0.6	27.8	60.2	7.3	2.3	1.8
SSG	0.9	12.0	78.2	6.6	1.6	.6
SFC	0.4	8.6	75.8	11.5	1.2	2.5
MSG/1SG	--	2.9	60.0	25.7	2.9	8.6
SGM/CSM	--	4.4	22.2	35.6	8.9	28.9
Overall	0.7	23.2	62.1	9.1	2.3	2.6

The majority of NCOs in the sample have at least some college education. Combining NCOs who have a GED or High School Diploma with those who have Some College accounts for 85% of the sample. In NCO ranks of SFC and above, Bachelors and higher degrees are far more common than in the ranks of CPL through SSG.

Of the NCOs who responded to the questionnaire, 49% indicated that they were affiliated with the Warrior Leader Course; 21% with the Advanced Leader Course, and 20% with the Senior Leader Course. The Sergeants Major Course accounted for an additional 2.5% of responding NCOs. Commandants/Assistant Commandants, Cadre, Ops Sergeants, NCOA Staff, etc., made up 6% of the sample, and 15% identified themselves as instructors for the Warrior Leaders Course (WLC), Advanced Leaders Course (ALC), Senior Leaders Course (SLC), or the Sergeants Major Course (SMC).

During one of our briefings on this research, a CSM asked if we had information on how many NCOs hold multiple MOSs. We did not have that information at the time, but began collecting it subsequently. In this sample of NCOs, the mean number of MOSs listed by respondents was $M = 1.35$ ($SD = 0.70$), with 73.0% of NCOs listing 1 MOS, 21.5% listing 2 MOSs, 3.4% listing 3 MOSs, and 2.1% listing 4 or more MOSs. The range for the number of MOSs listed is from 1 to 7.¹¹

Data Collection Procedure

The questionnaire was administered online over a two-week period in August 2011. The Institute for Noncommissioned Officer Professional Development (INCOPD) sent out a solicitation that invited Commandants of the Army's NCO Academies to allow their faculty, staff, and enrolled NCOs to review and, if these NCOs chose, to respond to the questionnaire. The response to the solicitation was excellent. There were 2,037 site visits, resulting in 99 partially completed questionnaires, and 1,490 completed questionnaires. These data were

¹¹ The number of MOSs listed by NCOs was higher for National Guard ($M = 1.94$; $SD = 1.12$; $n=167$) and Reserve NCOs ($M = 1.71$; $SD = 0.80$; $n = 70$) compared to Active Duty NCOs ($M = 1.25$; $SD = 0.54$; $n = 1,085$), $F(2, 1319) = 91.99$, $p = .000$.

checked for missing responses, extreme non-varying responding (i.e., all items received a rating of '3'), and extreme random responding, and were cleaned using standard data handling procedures (cf. DiLalla & Dollinger, 2005). The final data set was comprised of questionnaires from N = 1,345 Army NCOs.

Results

Reliability analyses were conducted following standard psychometric techniques (cf. Carmines & Zeller, 1979; Nunnally & Bernstein, 1994). A reliability assessment using Cronbach's α allowed us to determine the overall reliability of the NCO Self-Learning Strategies Questionnaire (based on the mean item ratings) and whether any items were unrelated to the overall Self-Learning Strategies construct and its component factors. Results of the reliability analysis are presented in Table 7.

Table 7
Reliabilities for Factors on the NCO Self-Learning Questionnaire

Strategy Factors	Cronbach's α	Number of Items
Planning/Analysis	0.94	8
Information Seeking	0.89	6
Sense-Making	0.90	5
Evaluating Learning	0.90	4
Attitudes/Motivations	0.93	8
Overall Scale	0.97	23

*Overall Scale metric excludes the 8 items for attitudes/motivations, as these items used different response options.

The reliabilities of the overall Self-Learning Questionnaire and the five thematic factors were 'very good' to 'excellent' in accord with customary coefficient alpha (α) criteria in the behavioral and social sciences (e.g., $\alpha=0.70$ and above; Schmitt, 1996). More complete factor and item level analyses are presented in Appendix F.

In addition to traditional reliability analyses, a confirmatory factor analysis was conducted to analyze how well the factor structure of our measurement model matched the structure of the thematic framework on which it was based. Results indicated that the fit was acceptable, although not ideal. The measurement model will likely benefit from modifications in future research, χ^2 ($df=424$, $N=1337$) = 3,709.83, $p < .000$. While the fit indices are within acceptable parameters for applied research (see Table 8), additional work with the factor structure—beyond the scope of the current analysis—may yield a more parsimonious measurement model.

Table 8. Fit Indices for the 5-Factor Model of NCO Self-Learning Strategies

Fit Index	Optimal Value	Observed Value
RMSEA	< 0.080	0.076 Lo90=0.074 Hi90=0.078
CFI	> 0.90	0.909
IFI	> 0.90	0.909
TLI	> 0.90	0.900

Note: RMSEA is the Root Mean Square Error of Approximation (see Browne & Cudeck, 1993); CFI is the Comparative Fit Index (see Bentler, 1990); IFI is the Incremental Fit Index (see Bollen, 1989); TLI is the Tucker-Lewis coefficient (see Bentler & Bonett, 1980).

Overall Preferred Learning Strategies of Army NCOs

When conducting the thematic analysis, we were able to identify the types of situations in which NCOs have engaged in learning on their own, as well as identify and describe particular themes related to the experience of self-learning among NCOs. From the thematic framework, we developed the NCO Self-Learning Strategies Questionnaire to measure NCOs' preferences for particular types of self-learning strategies/techniques as well as their level of agreement with particular attitudes and motivations perceived to support self-learning. Table 9 presents the overall self-learning preferences of the NCOs who responded in the questionnaire-based data collection.

Table 9
Ranked Factors/Items Identifying NCOs' Overall Preferred Learning Strategies

Factor	Strategy Item	Mean
I. Attitudes & Motivations	I take responsibility to learn what I need to in order to be effective in my job	4.17
	I never stop learning in order to stay knowledgeable	4.10
	I keep working at learning something, even when it is difficult	4.06
	I am always on the lookout for better ways to learn	4.06
	I stay on the lookout for new experiences, challenges, and/or assignments	3.96
	I understand failure is an opportunity to learn	3.90
	I monitor what I am doing when I am learning	3.88
	I seek out new problems to solve	3.70
II. Evaluating Learning	Asking trained Cadre/SMEs for advice and feedback on my performance	3.90
	Evaluating how well I was able to achieve my learning goals	3.81
	Seeking opportunities to teach/explain to others what I have learned	3.81
	Assessing my progress in terms of the Army's 'crawl, walk, run'	3.65

Table 9
Ranked Factors/Items Identifying NCOs Overall Preferred Learning Strategies (continued)

Factor	Strategy Item	Mean
III. Information-Seeking	Seeking opportunities to learn things hands-on; getting someone to show me	4.04
	Collecting examples of completed work (e.g., briefings, NCOERs) to use as a model	3.95
	Thinking about experiences I have had (or examples I know about) to help me make sense of what I am learning	3.90
	Identifying my most likely sources of good information (e.g., libraries, Google, CALL)	3.86
	Keeping a list, spreadsheet, notebook, etc., to track the resources I have collected and read	3.52
	Supporting my learning with computer programs, CDs, videos (e.g., language learning software)	3.47
IV. Planning & Analysis	Identifying what I hope to be able to do as a result of what I am learning	3.88
	Prioritizing learning tasks and/or topics that need to be covered	3.86
	Clearly defining what I needed to learn when beginning the learning process	3.85
	Planning step-by-step what I need to do in working toward my goal	3.81
	Setting a deadline to complete my learning task and/or produce a product (e.g., a briefing)	3.76
	Breaking down my overall learning task into smaller, manageable parts	3.73
	Planning how to pace my learning to minimize conflict with my other obligations	3.70
	Developing a time-line, roadmap, or list of milestones and use them to track my progress	3.58
V. Sensemaking	Spending extra time focusing on information that seems new, unusual, or confusing	3.81
	Seeking out different alternatives and points-of-view to help challenge/verify what I am learning	3.78
	Summarizing what I am learning in my own words	3.64
	Using mental imagery to play out ‘what if’ scenarios and/or to rehearse procedures	3.56
	Diagramming/white-boarding concepts and processes to understand them better	3.37

* Dashed line represents the median value for the items composing a factor. Items above the median are emphasized as relevant in NCOs learning strategies. Those items below the median are de-emphasized, or less relevant, in NCOs learning strategies.

Table 9 is rank ordered by mean rating for each item and by each factor. The dashed line that cuts through the section for each factor represents the median rating for that factor. Items that fall above the dashed line are those that NCOs tended to view as more relevant to their self-learning process, and those below the dashed line, as less relevant to their self-learning process.

For Attitudes and Motivations, there were four items that were most emphasized—each falling above the median value for the theme/factor. The top ranked item concerned taking responsibility to learn what one needs to learn to be effective on the job. Following that item were items related to life-long learning (‘never stop learning in order to stay knowledgeable’), persistence (‘keep working at something even when it is difficult’), and self-improvement (‘look out for better ways to learn’).

Of the Strategies and Techniques factors, Evaluating Learning tended to be rated as most relevant overall, although only one item was above the median. This item concerned seeking feedback/advice from trained Cadre or SMEs to assist the learner in evaluating performance. This finding is in accord with the emphasis NCOs in the focus groups put on relying on other NCOs for honest feedback and support in their self-learning efforts.

With respect to Information Seeking, a set of four items fell above the median. These concern seeking hands-on opportunities to learn in ‘show me’ types of learning situations, collecting examples of completed work, relying on experiences and examples, and identifying good sources of information in libraries, online, etc.

Planning and Analysis had three strategies/techniques that fell above the median. These concerned identifying what one hopes to be able to do as a result of learning, prioritizing tasks and topics to be covered, clearly defining the subject matter to be learned, and planning step-by-step how to get to the learning goal. These four items cover the NCO identifying a goal, defining what the NCO needs to know to get to the goal (the subject matter), and identifying and prioritizing the steps the NCO needs to take in working toward the goal.

Sensemaking, the most metacognitive of the factors, was the least emphasized overall. This also seemed to be the case in the focus group interviews. Three different strategies/techniques emerged as most emphasized with respect to this theme/factor. The first related to slowing down one’s learning pace when encountering new, unusual, or difficult information. The second concerned seeking out alternative points of view to verify and/or challenge what one is learning. Finally, the set of three most emphasized techniques for this factor was completed by an item that specified summarizing what one is learning in one’s own words.

Analysis of Preferred Self-Learning Attitudes and Strategies by NCO Demographics

Further statistical analyses were conducted to determine differences in NCOs’ preferred learning strategies by NCO rank, age, time in service, gender, Career Management Field, duty status, and career intentions. Table 10 summarizes the effects for each of the factors and each of the Attitudes and Motivations and Strategies and Techniques factors and items.

Table 10
Significant Effects Overall by Demographic Variables (Ordered Left to Right by Strength of Effect)

Factor/Item	Career Intentions	CMF	Gender	Time in Service	NCO Rank	Age	Civilian Education
Attitudes & Motivations	X	X	X				X
I take responsibility to learn what I need to in order to be effective in my job	X	X			X	X	X
I never stop learning in order to stay knowledgeable	X	X			X		X
I keep working at learning something, even when it is difficult	X	X			X		X
I am always on the lookout for better ways to learn	X	X	X				X
I stay on the lookout for new experiences, challenges, and/or assignments	X	X	X				X
I understand failure is an opportunity to learn	X	X	X				X
I monitor what I am doing when I am learning	X	X	X				
I seek out new problems to solve	X						
Planning & Analysis	X	X	X	X		X	
Identifying what I hope to be able to do as a result of what I am learning	X		X				X
Prioritizing learning tasks and/or topics that need to be covered	X		X	X			
Clearly defining what I needed to learn when beginning the learning process	X	X	X	X			
Planning step-by-step what I need to do in working toward my goal	X	X	X	X		X	
Setting a deadline to complete my learning task and/or produce a product (e.g., a briefing)	X	X					
Breaking down my overall learning task into smaller, manageable parts	X		X	X		X	
Planning how to pace my learning to minimize conflict with my other obligations	X	X	X	X	X		
Developing a time-line, roadmap, or list of milestones and use them to track my progress	X	X				X	

*Note: Duty Status was not included as it only had one marginally significant effect for the Information Seeking factor.

Table 10
Significant Effects Overall by Demographic Variables (Ordered Left to Right by Strength of Effect)
(continued)

Factor/Item	Career Intentions	CMF	Gender	Time in Service	NCO Rank	Age	Civilian Education
Information-Seeking	X	X	X	X			
Seeking opportunities to learn things hands-on; getting someone to show me	X	X					
Collecting examples of completed work (e.g., briefings, NCOERs) to use as a model	X	X					
Thinking about experiences I have had (or examples I know about) to help me make sense of what I am learning	X	X					
Identifying my most likely sources of good information (e.g., libraries, Google, CALL)	X	X		X			
Keeping a list, spreadsheet, notebook, etc., to track the resources I have collected and read	X	X	X		X	X	
Supporting my learning with computer programs, CDs, videos (e.g., language learning software)	X	X		X	X		
Sensemaking	X	X		X	X	X	
Spending extra time focusing on information that seems new, unusual, or confusing	X	X	X	X			
Seeking out different alternatives and points-of-view to help challenge/verify what I am learning	X	X	X	X			
Summarizing what I am learning in my own words	X			X			
Using mental imagery to play out ‘what if’ scenarios and/or to rehearse procedures				X	X	X	
Diagramming/white-boarding concepts and processes to understand them better	X			X	X		
Evaluating Learning	X	X	X				
Asking trained Cadre/SMEs for advice and feedback on my performance	X	X	X				X
Evaluating how well I was able to achieve my learning goals	X	X					
Seeking opportunities to teach/explain to others what I have learned	X	X					
Assessing my progress in terms of the Army’s ‘crawl, walk, run’	X						

*Note: Duty Status was not included as it only had one marginally significant effect for the Information Seeking factor.

The greatest number of significant effects overall were found for career intentions and Career Management Field, whereas the fewest number of significant effects were found for age and civilian education. The *Sense-Making* and *Planning and Analysis* factors appeared to vary the most across the different demographic variables we tested (5 out of 7 tests). This was followed by *Attitudes and Motivations* and *Information Seeking*, both of which varied in 4 out of 7 tests. *Evaluating Learning* appeared to vary the least (3 out of 7 tests).

Findings are summarized below. Please refer to Appendix G for a more detailed presentation of our analyses and results.

Career Intentions

NCOs were grouped into two career intentions categories: NCOs who probably or definitely intended to leave after their current obligation ($n = 170$), and NCOs who probably or definitely intended to stay beyond their current obligation or until retirement ($n=1,154$). Across the five factors, NCOs who probably or definitely intended to stay with the Army through their current obligation or until retirement endorsed attitudes and motivations items more highly than did NCOs who intended to leave after their current obligation. This same pattern of results held for the remaining strategies and techniques factors. At the item level, all item ratings differed significantly between the groups, except, “Using mental imagery to play out ‘what if’ scenarios and/or to rehearse procedures.” The findings suggest that self-learning may be perceived to be more relevant overall to NCOs who plan to continue their careers in the Army. These findings also suggest that research may profitably explore in detail the relationship between NCOs’ attitude toward their jobs and their openness to engaging in self-learning activities.

Career Management Field

Three Army Career Management Fields were represented in the NCO sample. These were Maneuvers, Fires, and Effects (also Combat Arms) ($n = 554$), Operations Support (also Combat Service) ($n = 286$), and Force Sustainment (Combat Service Support) ($n = 477$). Significant differences were found for all five factors. NCOs in Maneuvers, Fires, and Effects consistently rated the relevance of the various learning strategies lower than did NCOs in Operations Support and Force Sustainment. These differences may be due to the close connection between the Career Management Fields and specific Military Occupational Specialties, as different areas of knowledge and practice may require different approaches to learning. Further research may be warranted, with a focus on the self-learning strategies applied specifically by Maneuvers, Fires, and Effects related MOSs.

Gender

The Attitudes and Motivations, and Strategies and Techniques factors were analyzed by Gender (Male NCOs =1,167; Female NCOs = $n=153$). Four of the five factors indicated statistically significant differences. For Attitudes and Motivations, Planning and Analysis, Information Seeking, and Evaluating Learning, female NCOs had higher factor means than male NCOs. These differences may be attributable to, or confounded with, the effect of Career

Management Field, as Female NCOs have not traditionally held MOSs related to Maneuvers, Fires, and Effects (Combat Arms).

Time in Service

NCOs reported the number of years they have been in the service, which we coded into four general categories: 1 to 4 years of service ($n=337$), 5 to 9 years ($n=373$), 10 to 14 years ($n=293$), and 15 or more years ($n=321$). Statistically significant and marginally significant differences were found for three of the five factors: Planning and Analysis, Information Seeking, and Sensemaking. NCOs with 1 to 4 years in the Army viewed Planning and Analysis related items as more relevant than did NCOs with 10 to 14 years of service; there were no significant differences for NCOs with 5 to 9 years of service or 15+ years of service. With respect to Information Seeking, a post-hoc test indicated that the differences between groups were only marginally significant after correcting the p-value for multiple comparisons. There were two marginally significant differences for Information Seeking: NCOs with 1 to 4 years of service rated Information Seeking items as more relevant than did NCOs with 10 to 14 and with 15+ years of service. There were no significant differences between NCOs with 5 to 9 Years and any other group. Finally, post hoc tests for the Sensemaking factor indicated statistically significant differences between, with NCOs who had 1 to 4 years of service rating Sensemaking items as more relevant than and NCOs with 10 to 14 years and with 15+ Years. No significant differences were found between NCOs with 10 to 14 Years and 15+ Years. In addition, there was no significant difference found between NCOs with 5 to 9 Years and any other group. Planning and Analysis, Information Seeking, and Sensemaking items, as we presented them on the questionnaire, tended to be rated as more relevant by NCOs who had fewer years of service.

Noncommissioned Officer Rank

Given the excellent response we received from the Army NCO Academies, we were able to collect data across all NCO ranks. To simplify our analyses, NCO ranks were grouped into three categories in terms of Junior Ranks (CPL/SPC and SGT; $n = 680$), Middle Ranks (SSG and SFC; $n = 559$), and Senior Ranks (MSG/1SG and SGM/CSM; $n = 81$). We found significant differences for the Sensemaking factor. Junior Rank NCOs rated Sensemaking strategies as significantly more relevant to their self-learning process than did Middle Rank NCOs and Senior NCOs. In addition, Middle Rank NCOs rated Sensemaking Strategies as significantly more relevant to their self-learning strategy than did Senior Rank NCOs.

An additional analysis was conducted using the coefficient of variation for each factor by rank group. Statistically significant differences were found when comparing Senior Rank NCOs to both Junior and Middle Rank NCOs. Senior Rank NCOs had significantly more variation in how they rated specific learning strategies, indicating that they had more individualized preferences in terms of the strategies they would use to respond to the scenarios on the questionnaire. The effect was not strong enough, however, to notably reduce the reliability coefficients for the Senior NCO group on each of the factors on the questionnaire. This finding suggests that as NCOs develop in their careers, they hone in on strategies and techniques that work best for them as individuals or that they have learned what strategies/techniques work best for the situations we presented on the questionnaire. It is an interesting finding that may warrant

additional research, particularly concerning what variables may drive this down-selection of preferred strategies/techniques as NCOs move up in rank.

Age

NCOs were divided into three Age Groups: 19 to 29 years old ($n=630$), 30 to 39 years old ($n=464$), and 40+ years old ($n=232$). Two statistically significant differences were found among the three groups for the Planning and Analysis and Sensemaking factors. NCOs in the 40+ year age group rated Planning and Analysis as more relevant than NCOs in the 30 to 39 year age group. However, there were no significant differences indicated between NCOs in the 19 to 29 years age group and the other two groups. For the Sensemaking factor, NCOs in the 19 to 29 years age group rated strategies/techniques related to this factor as more relevant than did the 30 to 39 years old age, but not between the 40+ year old group and the other two groups.

Civilian Education

NCOs were grouped into three Civilian Education categories: GED/HS Diploma ($n = 313$), Some College ($n = 818$), and Bachelors or Higher Degree ($n = 186$). A significant effect was found for Civilian Education on the Attitudes and Motivations factor. NCOs with Some College and those with a Bachelors Degree or Higher rated items on the Attitudes and Motivations scale higher than did NCOs with GED/HS Diploma. There were no statistically significant differences between NCOs with Some College and those with a Bachelors Degree or Higher. This finding raises an interesting question concerning why having Some College or a Bachelors Degree or Higher is associated with an increase in Attitudes and Motivations ratings, but not in the relevance ratings of Strategies and Techniques factors, which seem more directly related to the self-learning process. Keeping this in mind, the finding does suggest support for initiatives promoting college education as part of the overall professional development process for NCOs.

Duty Status

NCOs self-identified their membership in three Duty Status categories: Active Duty ($n=1,083$), Army Reserve ($n = 70$), and National Guard ($n = 167$). One marginally significant effect was found for Information Seeking, which suggests that Army Reserve and National Guard NCOs rated Information Seeking strategies as more relevant than did Active Duty NCOs.

Discussion

NCOs adapt to unforeseen circumstances, learning what they need to learn to support the success of their mission. Often NCOs must learn on their own. This research effort focused on identifying, documenting, and describing situations and experiences in which NCOs learn on their own for their Army jobs. We further sought to measure key self-learning skills that NCOs may focus on developing to enhance their job performance and speed up learning and adaptability.

The Army may find the results of this research useful in the following ways:

- **Developing training materials and task-helpers.** This research enabled us to develop a draft handbook of self-learning strategies, which is well-grounded in NCO expertise as well as scientific literature. The draft handbook can serve as a foundation to develop training materials or task-helpers to enhance self-learning skills among NCOs earlier in their careers.¹²
- **Supporting implementation of the Army Learning Model.** Senior NCOs may be able to use the research reported here to support the professional development of their subordinates by fostering critical self-learning skills. The new Army Learning Model, based on the Army Learning Concept 2015 (ALC 2015), emphasizes individual responsibility for life-long learning both within and outside the institutional training context.¹³ An NCO Corps well-versed in self-learning skills supports that objective.
- **Informing self-learning initiatives for the NCO Corps.** Army decision makers, stakeholders and researchers may use the findings to inform their own work, developing initiatives to support the professional development of the Army NCO Corps. This research was intended to situate the science of self-learning appropriately in the professional context of Army NCOs, maintaining fidelity to their perspectives and their unique work environment.

Overview of the Research Effort

The research was largely exploratory, as no previous efforts had looked at self-learning among the Army NCO Corps. We conducted this research to support INCOPD in their initiatives to enhance and refine self-learning skills in the NCO Corps.

Based on 40 focus group interviews, we developed a thematic framework to describe the situations and experiences of self-learning based on the NCOs' accounts. The framework consisted of five themes set in the context of *Doing My Job as an NCO*: (a) *Having the Right Attitudes and Motivations*, (b) *Planning and Analyzing My Learning Situation*, (c) *Seeking Information About My Topic*, (d) *Making Sense of What I Am Learning*, and (e) *Evaluating How Well I Am Learning*. The meaning of each of these themes was further defined by sets of subthemes. The complexity of self-learning is apparent from the thematic framework, which was based on the consistent meanings NCOs described concerning their experiences. A variety of individual attitudes, time-management skills, social skills, self-awareness, and perceptual and interpretive abilities must come together to enable an NCO to execute a self-learning project effectively.

We then developed the NCO Self-Learning Strategies Questionnaire based on the thematic framework. NCOs from across the Army's NCOA were solicited to participate in a data collection using the Questionnaire. Responses indicated that Soldiers viewed themselves as

¹² Storyboards for an NCO Self-Learning Strategies eHandbook was developed as part of this research effort. It will be presented in a forthcoming ARI publication.

¹³ Refer to TRADOC PAM 525-8-2, 20 January 2011.

taking responsibility to learn, staying knowledgeable, persisting at learning even when it is difficult, and continuously improving their learning skills. Among the questions related to self-learning strategies and techniques, Evaluating Learning was rated as the most relevant factor, with NCOs indicating that asking a trained Cadre/SME for advice and feedback on their performance was the most relevant learning strategy. Other strategies, such as those related to Information Seeking, and Planning and Analysis were also rated as relevant, with the Sensemaking factor rated the lowest.

Conclusions

In conducting this research effort, we gained a better understanding of self-learning as it arises within the unique professional context of Army NCOs. At the outset of our research, we had assumed that this context may shape the learning process in a different way than what is typically presented in the research literature, which focuses on college students or professionals who work in fields that are radically different from those of Army NCOs. We found that the basic components of the NCOs' self-learning process are similar to what is described in the literature. In using this approach, we sought to maintain fidelity to the contexts in which NCOs practice their profession. With this research, we contribute an understanding of the self-learning experience from the first-person perspective of successful NCOs who have engaged in self-learning for their Army jobs, jobs that are often performed in a unique context. In addition, we have provided a first look at what self-learning attitudes and strategies Army NCOs view as most relevant to their self-learning process. This understanding may help to identify areas that could benefit from increased emphasis in professional development initiatives.

Self-Learning is Not Learning on Your Own

NCOs tend to prefer approaches to learning that are highly social and interactive. Learning models and learning initiatives should support, not disrupt, the socially interactive nature of NCO self-learning. As ironic as it sounds, self-learning seems rarely to be learning that is done solo. What is often desired when engaging in self-learning tasks is not books, computer programs, and Field Manuals, but the help and feedback of an expert, and an opportunity to actually practice doing what one is learning alongside other NCOs and Soldiers. The NCOs with whom we talked understood this well. Many, especially senior NCOs, expressed that they prefer to reach out to colleagues to assist them with their learning process. Initiatives that support, encourage, and facilitate this kind of socially interactive learning will likely be well received by the NCO Corps, and may be especially beneficial to junior NCOs who are beginning to develop a network of colleagues on whom they will rely throughout their careers. It may also be beneficial to look at how this social aspect of the self-learning process carries over into digital media, given the emphasis that is placed on networked information sharing among younger Soldiers (cf. Prensky's (2001) comparisons of 'digital natives' and 'digital immigrants').

Senior NCOs benefit from their many years in the Army in that they can readily access a network of expert colleagues. Through their colleagues, NCOs can access new equipment, have an expert take them through the crawl, walk, run learning process, and receive specific feedback from a peer on their performance. Other NCOs can also be a source of experience-based knowledge, providing insight on how to work through a particular problem, and providing self-

learning NCOs with useful information and insight. Kraiger (2008) makes a convincing argument for viewing knowledge as socially constructed within organizations, supporting what a number of NCOs pointed out: having good social skills, being able to engage in open dialogue with others, is essential to being an effective self-learner. The successful NCOs that we interviewed talked about seeking knowledge both up and down the chain of command, talking to whomever they needed in order to find out what they wanted to know. Throughout their careers, NCOs may be exposed to a variety of effective self-learning strategies and techniques from learning alongside other NCOs; over time, they may learn what works best for them, and focus on that more selective set of strategies and techniques.

Supporting the development of junior NCOs' social network may have the associated effect of supporting their development as self-directed life-long learners. This type of support is needed alongside accessible learning resources, such as online courses or websites such as the Center for Army Lessons Learned. Opportunities for NCOs to meet each other face-to-face and to network in the schoolhouse or at conferences, etc., can provide learning benefits that are significant to the Army, but may nonetheless be hard to measure. The desire NCOs express in wanting to connect with other NCOs for professional development and self-learning was emphasized in both the focus group interviews and the findings from the Questionnaire. It remains to be seen whether the increasing quality and quantity of Army focused social networking and knowledge sharing/knowledge management online sites will affect NCOs' preferences for learning in face-to-face situations.

Self-Learning and Cognitive Self-Awareness

Another significant area of focus for initiatives and research concerns techniques for increasing personal awareness and self-monitoring of thinking processes, as well as training NCOs in effective analytic/interpretive techniques to enhance understanding. Some NCOs in the focus group interviews provided examples of situations in which these types of techniques can be learned. For instance, the NCOs who described getting together with a group of other NCOs to compare each other's papers were applying the *method of variation* (Ihde, 1986) or *contrasting cases* (Schwartz & Bransford, 1998), by collecting and comparing many concrete examples in order to derive the stable features and critical differences between the examples. Further, the group discussion setting allowed the NCOs to elicit, discuss, and challenge each other's assumptions about what makes a good paper, an acceptable paper, or a bad paper.

Some recommendations concerning cognitive skills are addressed in existing Army training, such as the CAC-CAL Army Self-Development Handbook (2008). However, the focus there tends to be on study skills rather than analytic and interpretive techniques. One of the notable findings on the questionnaire was the lack of relevance NCOs attributed to Sensemaking strategies/techniques. This may indicate an area of potential intervention. Being able to use analytic and interpretive techniques in a self-aware way can be a powerful support for self-learning. In addition to cognitive psychology, an entire field of interdisciplinary scholarship has evolved around problems related to hermeneutics, which is the study of techniques to enhance human understanding, originally with respect to legal, religious, and literary texts (cf. Thiselton, 2009, for a good introduction). Hermeneutic scholarship, while at times written in a fashion that is difficult and antiquated, can be a rich source of ideas concerning problem solving and

Sensemaking strategies and techniques. Relying on peers for evaluation and feedback can help to compensate for mistakes and failures in understanding when self-learning; however, the self-learner ultimately needs to be able to self-assess and adjust course on his or her own and to do so in a way that helps cultivate awareness of potential biases that can distort self-evaluation (Breidert & Fite, 2009).

Techniques to Structure the Learning Process

Another area of potential focus for initiatives and research concerns the pre-planning process in self-learning projects. NCOs are often limited in terms of the time they can dedicate to any single self-learning project, having many obligations and responsibilities. Techniques related to preplanning can help maintain focus in the self-learning task, keeping the NCO self-learner from going farther into the weeds than he or she determines is necessary at the outset.

Especially for very lengthy or complex self-learning projects, planning skills that enable an NCO to identify a clear learning goal, establish specific goals and milestones, and track their progress in route to their goals are essential. For lower ranking NCOs, a supervisor may be able to help mentor time-management and establishment of milestones. The Army already uses many tools that may be repurposed to support self-learning projects, such as spreadsheets, calendars, project schedules, etc. In fact, one NCO we interviewed commented how much the planning is like establishing goals and tracking progress on an NCO Evaluation Report. In addition, the Army Career Tracker has the capability for Soldiers and supervisors to set and monitor both professional and personal goals, including those related to self-learning.

A number of techniques may be applied by NCOs during their self-learning process. Some examples include concept mapping (Novak & Cañas, 2008), chunking related information (Miller, 1956), seeking concrete examples of concepts (working with figurative language/metaphor) (Lakoff & Johnson, 1980), using memory cuing techniques (Miller, Galanter, & Pribram, 1960), or spacing learning over time (Howard, 2006).

Concept Mapping. Concept mapping is an approach to conceptualizing and representing information in terms of a graphical image. Typically, a concept map is structured hierarchically with more general concepts occupying central parts of the image, and more specific concepts organized surrounding the central concept. Often, the links between concepts are coded to indicate specific types of relationships. Developing, and reorganizing, concept maps during a learning process can improve a learner's ability to think through relationships among concepts from the material being learned. It can also be helpful to develop concept maps from memory first, and then follow-up with additional development of the map with learning resources in hand.

Chunking Related Information. In 1956, a psychologist, George Miller presented his finding that human beings have a limited capacity to take in and retain information in the short term. He found that 5 to 9 pieces of information is the average amount that most individuals can stay aware of at any given time. More recent research has estimated a smaller capacity for short-term/working memory (i.e., 3 to 5 chunks, see Cowan, 2000; also Sweller, 1988, cognitive load theory). One way to get around this limitation is to develop a structure out of the smaller bits of specific information, relating them in terms of having similar meanings or patterns (Chase &

Simon, 1973). For instance, to remember a list of numbers, it helps to organize them not as a sequence of individual numbers (e.g., 1-2-4-5-6-7), but instead to view them as triplets (e.g., 124-567). The same can be done with concepts or skills. A procedure can be broken down into sequences of related actions, so rather than remembering each step individually, chunks of steps can be organized around a specific purpose or concept. For example, the Army has already applied this technique in developing the SPORTS (i.e., Slap, Pull, Observe, Release, Tap, and Shoot) acronym to help Soldiers remember how to clear a stoppage immediately in a M16/A2 weapon system.

Seeking Concrete Examples of Concepts (Figurative Language/Metaphor). Lakoff and Johnson (1980) argued that human beings primarily perceive and think in terms of metaphors (i.e., when one idea or concept is used to represent another idea or concept). When learning, it is helpful to think in terms of how people and experiences from one's own life can serve as examples or can represent ideas that are more complex. In the process of learning, testing one's own individual metaphors against what one is trying to learn can help to elicit points where the metaphor may become incoherent or needs to be modified as learning progresses.

Using Memory Cuing Techniques. There are a variety of techniques that can be used to support a learner in remembering the information they are trying to learn. A number of these techniques, such as the method of loci, mnemonics, etc., are covered in a classic of cognitive psychology *Plans and the Structure of Behavior* (Miller, Gallanter, & Pribram, 1960). When exploring different techniques for improving memory, it is important to distinguish between being able to remember and being able to understand a concept or process, while both are important in supporting the learning process.

Spacing Learning Over Time. Staying focused for too long on a single topic or set of topics can undermine the learning process. Research suggests that spacing learning activities over time, so that one is learning smaller chunks of information, helps improve the learning process. This approach is useful not only to keep the learner from getting burned out, but also to give the learner time build conceptual structures to organize and make sense of the information they are learning. An interesting reference that pulls together many applications of research findings from neuroscience, cognitive psychology, and other disciplines to support learning is *The Owner's Manual for the Human Brain* by Howard (2006).

Pitching Self-Learning to Subordinate Leaders

Most Army NCOs are dedicated to their profession and to developing themselves as professionals. However, not all see self-learning as an activity that is relevant to what they do as NCOs. Some NCOs reported that when they need to learn something they 'just get on it and get it done,' without thinking about it as a self-learning process. To highlight that self-learning is a common activity and can be improved systematically, it may be useful to explore learning experiences they have had in order to elicit clear examples of the techniques, like those described in this research report. This can be an effective approach to highlight the relevance of self-learning skills in order to motivate self-development in this domain of knowledge and skills.

Another approach to teaching these skills may be to harness the experiences of NCOs who are skilled at self-learning to assist less skilled NCOs in acquiring strategies and techniques that will support their self-learning efforts. This already happens to some degree with NCOs sharing stories/experiences, providing examples of completed work, such as briefings or other Army documents, developing continuity books, and serving as sources of information/SMEs for each other. The storyboards for the NCO Self-Learning Handbook we developed as part of this effort are informed both by the empirical findings reported here and by what we know from the scientific literature concerning self-learning among adults. Sections of the Handbook may be used to guide training on self-learning skills in a mentorship situation. In addition, the Handbook storyboards could be developed into an online training package that NCOs could use to guide their own self-learning projects (as a task-helper), and/or as a resource to pursue additional understanding of self-learning strategies and techniques.

Demographic Characteristics Associated with Self-Learning

We also found that attitudes and motivations that support self-learning as well as preferred self-learning strategies and techniques varied with NCOs' demographic characteristics. The strongest effects were found for career intentions, career management field, and gender. We found weaker overall effects in relation to years in service, NCO rank, age, and civilian education. As this research was largely exploratory, some of these effects may warrant further exploration. Some unexpected results were those associated with civilian education, which had an effect of increasing the ratings NCOs gave to attitudes and motivations items, but not to the items that dealt with particular self-learning strategies and techniques. One possible explanation is that the self-learning skills we identified as the focus for measurement in this investigation are those that NCOs learn on the job and therefore are related to work-specific self-learning rather than skills that are related to academic pursuits (i.e., study skills) more generally. Even given that qualification, the data do appear to support the conclusion that college attendance either reflects a higher interest in self-learning and/or promotes growth in the value of learning experiences.

Much of the current literature on self-development has emphasized that self-learning skills are essential to professionals in developing and maintaining their professional competency. These skills are believed to be essential because of the increasing rate at which new information is developed and made available (Sharma & Montiero, 2010). Many recent initiatives within the Army have focused on NCO professional development (cf. NCO Structured Self-Development) and have begun to modify the Army's core training philosophy to address adult learning needs and processes (cf. Army Learning Concept, 2015). Skill and facility with self-learning strategies/techniques directly supports the increased responsibility that these initiatives put on the learner to maintain and develop professional competency.

The research findings reported here provide some evidence to suggest that over the course of a career, successful NCOs settle on a set of learning strategies and processes that work best for them, and they may develop facility with knowing when and how to apply particular strategies and techniques given their particular learning situation. To expose junior NCOs to a broad variety of self-learning strategies/techniques early in their careers may help to provide foundational skills, and as NCOs develop professionally they may be better able to select among

a broad repertoire of strategies/techniques those that work best for them in specific situations. It would seem that this process of honing self-learning skills has, for more senior NCOs, been picked up out of necessity and based on hard-won successes and occasional failures. Exposure to a broader set of self-learning strategies and techniques may help in the long term to support implementation of the Army Learning Model and NCO Structured Self-Development initiatives.

Recommendations

INCOPD has identified core competencies for NCOs. These are captured in the INCOPD NCO Competency Model (see Figure 4). At the center of the model is the central requirement for NCOs: to Lead. At each point of the triangle are requirements that concern the traditional roles of NCOs (a) training, education, and development (self and others), (b) maintaining and enforcing standards, and (c) caring for Soldiers and equipment.

The self-learning attitudes/motivations and strategies/techniques identified by this research support all of these objectives, primarily by focusing on NCO skills related to problem solving (critical, creative, adaptive thinking), learning (life-long learning, and self-learning specifically), team building (communication, negotiation, collaboration), and professional competence. Self-learning attitudes/motivations and strategies/techniques indicate a set of skills that, while not always directly related to a particular NCO competency, can support the development of all competencies.



Figure 4. INCOPD NCO Core Competencies Model

Given the support that self-learning skills provide to developing competencies in other areas, the following recommendations may be useful to commanders who are seeking to create a positive self-learning climate in their organizations. One of the clearest recommendations is to reward Soldiers and NCOs for exercising initiative and undertaking their own job-related self-learning projects. Objectives related to self-learning projects could be included in NCOERs (e.g., the NCO sets and achieves self-development goals) or in promotion criteria (e.g., successful projects/demonstrated skills that have been independently learned). Another way to foster a positive self-learning climate is to provide opportunities and resources for Soldiers and NCOs to generate and share knowledge. Finally, leaders can encourage NCOs and Soldiers to undertake self-learning projects by providing time and information resources, as well as by openly modeling intellectual curiosity and pursuit of self-learning projects. These approaches are important to Soldiers' and NCOs' confidence in their abilities to learn on their own, which can be helped by providing supportive feedback and mentoring to subordinates who undertake self-learning projects.

Tools may also be provided to support self-learning. Examples include Army Career Tracker, Multi Source Assessment and Feedback (360-degree feedback assessments), or other tools designed to identify learning needs and to monitor progress. Developing a road map of learning events associated with implementation of the Army Learning Model (cf. ALC 2015) competencies may also be useful to Soldiers and NCOs. INCOPD has drafted a broad set of learning outcomes for the NCO core competencies that can be coupled with existing professional development models so that Soldiers and leaders have a starting point for creating individual development plans, ensuring that they actively engage in the self-learning dimension of the Army Learning Model. Continuity books and other resources may help to determine job specific competencies. In combination, developing a positive self-learning climate as well as tools that facilitate Soldier self-development needs that are specific and can provide the foundation NCOs need to take a new position with a unit or assume a new duty position.

As increasing numbers of Soldiers have returned from the war in Iraq and are returning from the war in Afghanistan, a slower operational tempo might be assumed to imply more time for formal training and less need for self-learning. The lessons learned from the past ten years, however, have clearly shown that it is very difficult to prepare Soldiers for every situation that they may face during deployments. Coupling the uncertainty of future warfare with adversaries that are rapidly adapting means that the speed and efficiency of Soldiers' learning will continue to be a major factor in the success of the Army. Despite budget reductions, the projected decrease in deployments represents an opportunity for Soldiers and the Army to invest in self-learning and the development of self-learning skills. As warfare evolves, those who learn faster than their adversaries are those most likely to be the victors.

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Acronyms

1SG	First Sergeant (E-8)
α	Cronbach's Reliability Coefficient Alpha
AKO	Army Knowledge Online
ALC	Advanced Leaders Course
ALC 2015	Army Learning Concept 2015
CFvar	Coefficient of Variation (signal-to-noise ratio)
CAC-CAL	Combined Arms Center, Center for Army Leadership
CALL	Center for Army Lessons Learned
CSM	Command Sergeant Major (E-9)
DA	Department of the Army
DA-PAM	Department of the Army Pamphlet
η^2_p	Eta Squared (Partialed Variance)
FM	Field Manual
IV	Intravenous Drip
INCPD	Institute for Noncommissioned Officer Professional Development
M	Mean; a statistical index
MANOVA	Multivariate Analysis of Variance
MOS	Military Occupational Specialty
MSG	Master Sergeant (E-8)
N	Number of participants (sample size)
NCO	Noncommissioned Officer
NCOA	Noncommissioned Officer Academy
NCOER	Noncommissioned Officer Evaluation Report
OPN	Operation Nurse
RN	Registered Nurse
SD	Standard Deviation; a statistical index
SFC	Sergeant First Class (E-7)
SGT	Sergeant (E-5)
SLC	Senior Leaders Course
SMA	Sergeant Major of the Army
SMC	Sergeants Major Course
SME	Subject Matter Expert

SPC/CPL	Specialist/Corporal (E-4)
SSG	Staff Sergeant (E-6)
SQ3R	Scan, Question, Read, Recite, and Review
TRADOC	Training and Doctrine Command
USASMA	United States Army Sergeants Major Academy
WLC	Warrior Leaders Course

APPENDIX A

EXPERIENCE-BASED NCO SELF-LEARNING STRATEGIES QUESTIONNAIRE

NCO SELF-LEARNING STRATEGIES QUESTIONNAIRE
(Final 23 JUN 2011)

INTRODUCTION

Often, NCOs need to do tasks on the job they have not been formally trained to do. Even without formal training, NCOs who find themselves in that type of situation tend to be successful. A hallmark skill for NCOs is being able to learn effectively on their own; that is, NCOs need to be able to learn on the job by tracking down learning resources, quickly making sense of information and experiences, and using what they learn to complete complex tasks. We are interested in identifying the skills and techniques you prefer to use.

INSTRUCTIONS

To complete this questionnaire, we would like you to recall four situations in the past year in which you learned something on your own for your job. You may have been working on an important task; perhaps you wanted to refresh or pick up a new skill. Some examples: “The first time I had to write NCOERs,” “Teaching myself to speak a useful amount of Farsi before deploying,” or “Getting some hands-on time with an unfamiliar piece of equipment.”

Take a few minutes to recall and make a few brief notes in the spaces below that you can use to remind yourself of those four situations as you respond to the questions that follow. Only write as much as you need to cue your memory of the situation, and then read the instructions at the bottom of the page.

a.	
b.	
c.	
d.	

PLEASE SET THIS PAGE TO THE SIDE TO USE AS A REFERENCE
AND
CONTINUE ON THE FOLLOWING PAGE

INSTRUCTIONS: Below are learning strategies that NCOs have reported using. Referring to the situations you listed on the previous page (a, b, c, d), please circle the corresponding response option (None, a, b, c, d) to indicate whether you recall using the described learning strategy in that situation. Then, please rate the average effectiveness of each strategy you have used in terms of how well it helped you to learn what you set out to learn. If you have no experience with the described strategy, circle 'None,' and do not rate the strategy's effectiveness.

Learning Strategies		Circle the situations in which you applied the described learning strategy					How effective was this strategy for your learning?		
							Not Effective	Somewhat Effective	Very Effective
1.	Clearly define what I needed to learn when beginning the learning process	None	a	b	c	d	NE	SE	VE
2.	Identify what I hope to be able to do as a result of what I am learning	None	a	b	c	d	NE	SE	VE
3.	Break down my overall learning task into smaller, manageable parts	None	a	b	c	d	NE	SE	VE
4.	Plan step-by-step what I need to do in working toward my goal	None	a	b	c	d	NE	SE	VE
5.	Plan how to pace my learning to minimize conflict with my other obligations	None	a	b	c	d	NE	SE	VE
6.	Prioritize learning tasks and/or topics that need to be covered	None	a	b	c	d	NE	SE	VE
7.	Develop a time-line, roadmap, or list of milestones and use them to track my progress	None	a	b	c	d	NE	SE	VE
8.	Set a deadline to complete my learning task and/or produce a product (e.g., a briefing)	None	a	b	c	d	NE	SE	VE
9.	Identify my most likely sources of good information (e.g., libraries, Google, CALL)	None	a	b	c	d	NE	SE	VE
10.	Collect examples of completed work (e.g., briefings, NCOERs) to use as a model	None	a	b	c	d	NE	SE	VE
11.	Think about experiences I have had (or examples I know about) to help me make sense of what I am learning	None	a	b	c	d	NE	SE	VE
12.	Seek opportunities to learn things hands-on; get someone to show me	None	a	b	c	d	NE	SE	VE
13.	Support my learning with computer programs, CDs, videos (e.g., language learning software)	None	a	b	c	d	NE	SE	VE
14.	Keep a list, spreadsheet, notebook, etc., to track the resources I have collected and read	None	a	b	c	d	NE	SE	VE
15.	Summarize what I am learning in my own words	None	a	b	c	d	NE	SE	VE

PLEASE CONTINUE ON THE FOLLOWING PAGE

Learning Strategies		Circle the situations in which you applied the described learning strategy					How effective was this strategy for your learning?		
							Not Effective	Somewhat Effective	Very Effective
16.	Spend extra time focusing on information that seems new, unusual, or confusing	None	a	b	c	d	NE	SE	VE
17.	Diagram/white-board concepts and processes to understand them better	None	a	b	c	d	NE	SE	VE
18.	Seek out different alternatives and points-of-view to help challenge/verify what I am learning	None	a	b	c	d	NE	SE	VE
19.	Use mental imagery to play out 'what if' scenarios and/or to rehearse procedures	None	a	b	c	d	NE	SE	VE
20.	Ask trained Cadre/SMEs for advice and feedback on my performance	None	a	b	c	d	NE	SE	VE
21.	Seek opportunities to teach/explain to others what I have learned	None	a	b	c	d	NE	SE	VE
22.	Assess my progress in terms of the Army's 'crawl, walk, run'	None	a	b	c	d	NE	SE	VE
23.	Evaluate how well I was able to achieve my learning goals	None	a	b	c	d	NE	SE	VE

For this next set of questions, please rate how much you agree/disagree with each statement as it relates to self-learning. Please use the following scale for your responses: *Strongly Disagree* (1); *Somewhat Disagree* (2); *Neither Agree nor Disagree* (3); *Somewhat Agree* (4); *Strongly Agree* (5).

		Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
1.	I stay on the lookout for new experiences, challenges, and/or assignments	1	2	3	4	5
2.	I seek out new problems to solve	1	2	3	4	5
3.	I keep working at learning something, even when it is difficult	1	2	3	4	5
4.	I understand failure is an opportunity to learn	1	2	3	4	5
5.	I never stop learning in order to stay knowledgeable	1	2	3	4	5
6.	I take responsibility to learn what I need to in order to be effective in my job	1	2	3	4	5
7.	I am always on the lookout for better ways to learn	1	2	3	4	5
8.	I monitor what I am doing when I am learning	1	2	3	4	5

THANK YOU FOR YOUR TIME IN COMPLETING THIS QUESTIONNAIRE

APPENDIX B

SCENARIO-BASED NCO SELF-LEARNING STRATEGIES QUESTIONNAIRE

NCO SELF-LEARNING STRATEGIES SCENARIO SCALE
(Final 23 JUN 2011)

INTRODUCTION

Often, NCOs need to do tasks on the job they have not been formally trained to do. Even without formal training, NCOs who find themselves in that type of situation tend to be successful. A hallmark skill for NCOs is being able to learn effectively on their own; that is, NCOs need to be able to learn on the job by tracking down learning resources, quickly making sense of information and experiences, and using what they learn to complete complex tasks. We are interested in identifying the skills and techniques you prefer to use.

INSTRUCTIONS

Please read the following four scenarios and respond to the questions following each scenario. When you read each scenario, do your best to imagine yourself in the situation described.

Scenario 1

You have been recently promoted to SGT and serve as a Team Leader in 2nd Platoon, Bravo Company. During your time in the Army, while deployed to Iraq and Afghanistan, you have had numerous Squad Leaders. Some of these NCOs seemed to know how to provide great leadership by providing purpose, direction, and motivation to Soldiers to get them to complete the unit mission to standard. Other NCOs provided just enough leadership to get Soldiers to do the minimum of what was required. As a new SGT, you want to be an outstanding leader who is respected by your superiors, peers, and subordinates for being a full spectrum NCO. You resolve to learn more about the leadership techniques for influencing others so you can achieve this goal.

(1) Please rate how easy/difficult it was for you to imagine yourself in this scenario:

Very Easy	Somewhat Easy	Average	Somewhat Difficult	Very Difficult
1	2	3	4	5

PLEASE CONTINUE ON THE FOLLOWING PAGE

INSTRUCTIONS: Below are listed various learning strategies that NCOs have reported using to learn on their own. For each learning strategy listed below, please rate how relevant it would be in your approach to learning in Scenario 1.

		Not Relevant	Somewhat Relevant	Relevant	Very Relevant	Essential
1.	Clearly defining what I needed to learn when beginning the learning process	NR	SR	R	VR	E
2.	Identifying what I hope to be able to do as a result of what I am learning	NR	SR	R	VR	E
3.	Breaking down my overall learning task into smaller, manageable parts	NR	SR	R	VR	E
4.	Planning step-by-step what I need to do in working toward my goal	NR	SR	R	VR	E
5.	Planning how to pace my learning to minimize conflict with my other obligations	NR	SR	R	VR	E
6.	Prioritizing learning tasks and/or topics that need to be covered	NR	SR	R	VR	E
7.	Developing a time-line, roadmap, or list of milestones and use them to track my progress	NR	SR	R	VR	E
8.	Setting a deadline to complete my learning task and/or produce a product (e.g., a briefing)	NR	SR	R	VR	E
9.	Identifying my most likely sources of good information (e.g., libraries, Google, CALL)	NR	SR	R	VR	E
10.	Collecting examples of completed work (e.g., briefings, NCOERs) to use as a model	NR	SR	R	VR	E
11.	Thinking about experiences I have had (or examples I know about) to help me make sense of what I am learning	NR	SR	R	VR	E
12.	Seeking opportunities to learn things hands-on; getting someone to show me	NR	SR	R	VR	E
13.	Supporting my learning with computer programs, CDs, videos (e.g., language learning software)	NR	SR	R	VR	E
14.	Keeping a list, spreadsheet, notebook, etc., to track the resources I have collected and read	NR	SR	R	VR	E
15.	Summarizing what I am learning in my own words	NR	SR	R	VR	E
16.	Spending extra time focusing on information that seems new, unusual, or confusing	NR	SR	R	VR	E
17.	Diagramming/white-boarding concepts and processes to understand them better	NR	SR	R	VR	E
18.	Seeking out different alternatives and points-of-view to help challenge/verify what I am learning	NR	SR	R	VR	E
19.	Using mental imagery to play out 'what if' scenarios and/or to rehearse procedures	NR	SR	R	VR	E
20.	Asking trained Cadre/SMEs for advice and feedback on my performance	NR	SR	R	VR	E
21.	Seeking opportunities to teach/explain to others what I have learned	NR	SR	R	VR	E
22.	Assessing my progress in terms of the Army's 'crawl, walk, run'	NR	SR	R	VR	E
23.	Evaluating how well I was able to achieve my learning goals	NR	SR	R	VR	E

PLEASE CONTINUE ON THE FOLLOWING PAGE

Scenario 2

You were recently promoted to SSG and assumed your new duty position as 2nd Squad Leader; 1st Platoon, Alpha Company in January. The first week of June, three NCOs were placed on a tasker from BDE to deploy to Afghanistan in support of operation New Dawn. The 1SG directed the Soldiers' leadership to conduct a change of rater NCOER due by the 2nd week of July. You had just finished the NCOs first quarterly counseling and are now expected to produce an NCOER; you have not had any experience at writing NCOERs. You work extremely hard through the weekend to write all three NCOERs, which are due the following Monday. After completing the evaluations, you feel unsure if they are up to Army standards. After conducting a self-assessment, you determine that you will strengthen your skills at writing NCOERs, so you can be as effective as possible in properly supporting your Soldiers.

(1) Please rate how easy/difficult it was for you to imagine yourself in this scenario:

Very Easy	Somewhat Easy	Average	Somewhat Difficult	Very Difficult
1	2	3	4	5

PLEASE CONTINUE ON THE FOLLOWING PAGE

INSTRUCTIONS: Below are listed various learning strategies that NCOs have reported using to learn on their own. For each learning strategy listed below, please rate how relevant it would be in your approach to learning in Scenario 2.

	Learning Strategy	Not Relevant	Somewhat Relevant	Relevant	Very Relevant	Essential
1.	Clearly defining what I needed to learn when beginning the learning process	NR	SR	R	VR	E
2.	Identifying what I hope to be able to do as a result of what I am learning	NR	SR	R	VR	E
3.	Breaking down my overall learning task into smaller, manageable parts	NR	SR	R	VR	E
4.	Planning step-by-step what I need to do in working toward my goal	NR	SR	R	VR	E
5.	Planning how to pace my learning to minimize conflict with my other obligations	NR	SR	R	VR	E
6.	Prioritizing learning tasks and/or topics that need to be covered	NR	SR	R	VR	E
7.	Developing a time-line, roadmap, or list of milestones and use them to track my progress	NR	SR	R	VR	E
8.	Setting a deadline to complete my learning task and/or produce a product (e.g., a briefing)	NR	SR	R	VR	E
9.	Identifying my most likely sources of good information (e.g., libraries, Google, CALL)	NR	SR	R	VR	E
10.	Collecting examples of completed work (e.g., briefings, NCOERs) to use as a model	NR	SR	R	VR	E
11.	Thinking about experiences I have had (or examples I know about) to help me make sense of what I am learning	NR	SR	R	VR	E
12.	Seeking opportunities to learn things hands-on; getting someone to show me	NR	SR	R	VR	E
13.	Supporting my learning with computer programs, CDs, videos (e.g., language learning software)	NR	SR	R	VR	E
14.	Keeping a list, spreadsheet, notebook, etc., to track the resources I have collected and read	NR	SR	R	VR	E
15.	Summarizing what I am learning in my own words	NR	SR	R	VR	E
16.	Spending extra time focusing on information that seems new, unusual, or confusing	NR	SR	R	VR	E
17.	Diagramming/white-boarding concepts and processes to understand them better	NR	SR	R	VR	E
18.	Seeking out different alternatives and points-of-view to help challenge/verify what I am learning	NR	SR	R	VR	E
19.	Using mental imagery to play out 'what if' scenarios and/or to rehearse procedures	NR	SR	R	VR	E
20.	Asking trained Cadre/SMEs for advice and feedback on my performance	NR	SR	R	VR	E
21.	Seeking opportunities to teach/explain to others what I have learned	NR	SR	R	VR	E
22.	Assessing my progress in terms of the Army's 'crawl, walk, run'	NR	SR	R	VR	E
23.	Evaluating how well I was able to achieve my learning goals	NR	SR	R	VR	E

PLEASE CONTINUE ON THE FOLLOWING PAGE

Scenario 3

You are a SSG who was selected for an instructor position at the Warrior Leader Course (WLC). You reported for duty in the beginning of June and were assigned several courses to teach, some of which were unfamiliar given your MOS and operational experiences. Even though you are unfamiliar with those topics, you will be teaching the class for the first time in 4 weeks, as soon as the next WLC starts. You want to be proficient with teaching the course by then to ensure the students learn the skills and that you will present yourself well.

(1) Please rate how easy/difficult it was for you to imagine yourself in this scenario:

Very Easy	Somewhat Easy	Average	Somewhat Difficult	Very Difficult
1	2	3	4	5

PLEASE CONTINUE ON THE FOLLOWING PAGE

INSTRUCTIONS: Below are listed various learning strategies that NCOs have reported using to learn on their own. For each learning strategy listed below, please rate how relevant it would be in your approach to learning in Scenario 3.

	Learning Strategy	Not Relevant	Somewhat Relevant	Relevant	Very Relevant	Essential
1.	Clearly defining what I needed to learn when beginning the learning process	NR	SR	R	VR	E
2.	Identifying what I hope to be able to do as a result of what I am learning	NR	SR	R	VR	E
3.	Breaking down my overall learning task into smaller, manageable parts	NR	SR	R	VR	E
4.	Planning step-by-step what I need to do in working toward my goal	NR	SR	R	VR	E
5.	Planning how to pace my learning to minimize conflict with my other obligations	NR	SR	R	VR	E
6.	Prioritizing learning tasks and/or topics that need to be covered	NR	SR	R	VR	E
7.	Developing a time-line, roadmap, or list of milestones and use them to track my progress	NR	SR	R	VR	E
8.	Setting a deadline to complete my learning task and/or produce a product (e.g., a briefing)	NR	SR	R	VR	E
9.	Identifying my most likely sources of good information (e.g., libraries, Google, CALL)	NR	SR	R	VR	E
10.	Collecting examples of completed work (e.g., briefings, NCOERs) to use as a model	NR	SR	R	VR	E
11.	Thinking about experiences I have had (or examples I know about) to help me make sense of what I am learning	NR	SR	R	VR	E
12.	Seeking opportunities to learn things hands-on; getting someone to show me	NR	SR	R	VR	E
13.	Supporting my learning with computer programs, CDs, videos (e.g., language learning software)	NR	SR	R	VR	E
14.	Keeping a list, spreadsheet, notebook, etc., to track the resources I have collected and read	NR	SR	R	VR	E
15.	Summarizing what I am learning in my own words	NR	SR	R	VR	E
16.	Spending extra time focusing on information that seems new, unusual, or confusing	NR	SR	R	VR	E
17.	Diagramming/white-boarding concepts and processes to understand them better	NR	SR	R	VR	E
18.	Seeking out different alternatives and points-of-view to help challenge/verify what I am learning	NR	SR	R	VR	E
19.	Using mental imagery to play out 'what if' scenarios and/or to rehearse procedures	NR	SR	R	VR	E
20.	Asking trained Cadre/SMEs for advice and feedback on my performance	NR	SR	R	VR	E
21.	Seeking opportunities to teach/explain to others what I have learned	NR	SR	R	VR	E
22.	Assessing my progress in terms of the Army's 'crawl, walk, run'	NR	SR	R	VR	E
23.	Evaluating how well I was able to achieve my learning goals	NR	SR	R	VR	E

PLEASE CONTINUE ON THE FOLLOWING PAGE

Scenario 4

You are an SFC working as an Operations NCO at the Headquarters Company for a Brigade. The current 1SG was reassigned to a training company and when the 1SG left, you were slotted as the 1SG. Because of this, you now have to learn new skills, procedures, and responsibilities without the benefit of first taking the Senior Leader Course.

(1) Please rate how easy/difficult it was for you to imagine yourself in this scenario:

Very Easy	Somewhat Easy	Average	Somewhat Difficult	Very Difficult
1	2	3	4	5

PLEASE CONTINUE ON THE FOLLOWING PAGE

INSTRUCTIONS: Below are listed various learning strategies that NCOs have reported using to learn on their own. For each learning strategy listed below, please rate how relevant it would be in your approach to learning in Scenario 4.

	Learning Strategy	Not Relevant	Somewhat Relevant	Relevant	Very Relevant	Essential
1.	Clearly defining what I needed to learn when beginning the learning process	NR	SR	R	VR	E
2.	Identifying what I hope to be able to do as a result of what I am learning	NR	SR	R	VR	E
3.	Breaking down my overall learning task into smaller, manageable parts	NR	SR	R	VR	E
4.	Planning step-by-step what I need to do in working toward my goal	NR	SR	R	VR	E
5.	Planning how to pace my learning to minimize conflict with my other obligations	NR	SR	R	VR	E
6.	Prioritizing learning tasks and/or topics that need to be covered	NR	SR	R	VR	E
7.	Developing a time-line, roadmap, or list of milestones and use them to track my progress	NR	SR	R	VR	E
8.	Setting a deadline to complete my learning task and/or produce a product (e.g., a briefing)	NR	SR	R	VR	E
9.	Identifying my most likely sources of good information (e.g., libraries, Google, CALL)	NR	SR	R	VR	E
10.	Collecting examples of completed work (e.g., briefings, NCOERs) to use as a model	NR	SR	R	VR	E
11.	Thinking about experiences I have had (or examples I know about) to help me make sense of what I am learning	NR	SR	R	VR	E
12.	Seeking opportunities to learn things hands-on; getting someone to show me	NR	SR	R	VR	E
13.	Supporting my learning with computer programs, CDs, videos (e.g., language learning software)	NR	SR	R	VR	E
14.	Keeping a list, spreadsheet, notebook, etc., to track the resources I have collected and read	NR	SR	R	VR	E
15.	Summarizing what I am learning in my own words	NR	SR	R	VR	E
16.	Spending extra time focusing on information that seems new, unusual, or confusing	NR	SR	R	VR	E
17.	Diagramming/white-boarding concepts and processes to understand them better	NR	SR	R	VR	E
18.	Seeking out different alternatives and points-of-view to help challenge/verify what I am learning	NR	SR	R	VR	E
19.	Using mental imagery to play out 'what if' scenarios and/or to rehearse procedures	NR	SR	R	VR	E
20.	Asking trained Cadre/SMEs for advice and feedback on my performance	NR	SR	R	VR	E
21.	Seeking opportunities to teach/explain to others what I have learned	NR	SR	R	VR	E
22.	Assessing my progress in terms of the Army's 'crawl, walk, run'	NR	SR	R	VR	E
23.	Evaluating how well I was able to achieve my learning goals	NR	SR	R	VR	E

PLEASE CONTINUE ON THE FOLLOWING PAGE

SELF-LEARNING BELIEFS

For this next set of questions, please rate how much you agree/disagree with each statement as it relates to self-learning. Please use the following scale for your responses: *Strongly Disagree (1); Somewhat Disagree (2); Neither Agree nor Disagree (3); Somewhat Agree (4); Strongly Agree (5)*.

		Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
1.	I stay on the lookout for new experiences, challenges, and/or assignments	1	2	3	4	5
2.	I seek out new problems to solve	1	2	3	4	5
3.	I keep working at learning something, even when it is difficult	1	2	3	4	5
4.	I understand failure is an opportunity to learn	1	2	3	4	5
5.	I never stop learning in order to stay knowledgeable	1	2	3	4	5
6.	I take responsibility to learn what I need to in order to be effective in my job	1	2	3	4	5
7.	I am always on the lookout for better ways to learn	1	2	3	4	5
8.	I monitor what I am doing when I am learning	1	2	3	4	5

THANK YOU FOR YOUR TIME IN COMPLETING THIS QUESTIONNAIRE

APPENDIX C

FOCUS GROUP INTERVIEW PROTOCOL
(FIRST SET OF SESSIONS)

Strategies for Self-Learning in the Noncommissioned Officer Education System (NCOES)

Interview Protocol #1

Introductions

- Researchers
- ARI/PDRI

Project Background & Objectives

- We are conducting research to enhance the Army's understanding of the skills a successful NCO uses to engage in self-learning.
- We define self-learning as a situation in which an NCO takes responsibility on his or her own to learn a job-related concept, task, or skill. An NCO engages in self-learning to become more able to do a current job and/or an anticipated future job.
- We want to identify and document what you, as a successful NCO, have done when you have engaged in self-learning for professional development. We want to find out about the strategies you use that have been useful to you when learning new concepts, tasks, or skills and/or when discovering ways to enhance what you can do with what you already know. [For trainers: As trainers, you are also in a position to know about strategies you have seen your students use, or have taught your students, and we are interested in those as well.]
- Our goal is to develop an e-Handbook that will support Soldiers in developing self-learning skills and strategies as well as support leaders in guiding Soldiers to enhance their capability for self-learning. The e-Handbook will be made available to the NCO Corps and the Army by the Army's Institute for Non-Commissioned Officer Professional Development.
- Today, we will be asking you to think about a few specific times you learned something on your own for your job and what the learning experience was like for you. During this interview, we work to facilitate you in telling us about your learning experiences. We hope that everyone discussing this topic together will help to us to document the variety of learning experiences you all have had as well as similarities and differences you see between your own and other NCOs' learning experiences.

Privacy Act & Informed Consent

- As we ask you questions, we would like to take notes and record your answers to help us remember what you said. However, to assure your personal privacy, we will not record your name in conjunction with your answers. We will analyze and report your responses as those of a group of successful Army NCOs, and not in terms of individuals.

- Hand out informed consent, explain the contents of the informed consent (including limitations on confidentiality) and see if they have any questions about it or the study.

Instructions for the Task

- Let's get started. Keep in mind as you describe your experiences that we do not need to know about specific names of the people and/or places involved. In addition:
 - Please do not discuss any illegal activities or operationally sensitive information that you may have witnessed. We cannot guarantee confidentiality in such instances.
 - This discussion is unclassified.
 - As you describe your experiences, we will ask follow up questions to ensure we have captured the details we need.
- After the interviews, thank the Soldiers for their time.

Notes to Interviewer:

- If the interviewer notes that illegal/unethical activity is being reported or operationally sensitive information is being disclosed, remind them that the information provided should be unclassified and that individuals in the room may be required to report illegal/unethical activities to the appropriate authorities.
- Any information received that the individual poses a threat to others, of child abuse or neglect, or abuse of the elderly or disabled, will be reported to the Judge Advocate General. Information that the individual poses a threat to one's self will be reported to the local chaplain or mental health services. For specific criminal offenses, the researcher will fulfill his or her obligation not to obstruct justice. That is, the individual will reveal information about criminal behavior disclosed during the interview when asked about it by the appropriate authorities, will not assist in the concealment of such information, and will not take steps that would assist the criminal in avoiding prosecution for the offense.

Interview Questions

1. **Self-learning past example.** Recall (or Describe) a situation in which you learned something on your own in order to improve your performance at work or further your career, etc.
 - a. What was it that you wanted to learn in that situation and why were you motivated to learn it?
 - b. What were some techniques or strategies you were aware of using in order to learn in that situation?
 - c. Describe how you applied those techniques or strategies in that situation.
 - d. How did you determine if you were successful in learning what you set out to learn?

- e. If you weren't successful at first, what other steps did you take to learn what you set out to learn?
 - f. What lessons did you learn from the experience that you might want to pass on to others—i.e., takeaways for coaching/mentoring junior enlisted Soldiers?
2. **Self-learning – no follow through.** Recall (or Describe) a situation in which you wanted to learn something for work but were not able to complete what you set out to do.
- a. What do you believe made it difficult to learn in that situation?
 - b. What might have enabled you to continue working on learning in that situation?
3. **Current examples.** Think about something you would like to (or need to) learn on your own at this point in your career to enhance your work performance?
- a. What is it that you would like to (or need to) learn?
 - b. How did you identify that topic?
 - c. Please describe any techniques or strategies you have identified for how you may go about learning about that topic?
 - d. What plans do you have in place to determine whether you are successful in learning what you intend to learn?
4. **Self-learning Style.** We would like to make a list of the characteristics of learning situations that you feel best enable you to learn work related concepts, skills, and activities on your own.
- a. What sorts of things have you discovered over the years about how you learn that have helped you to accomplish learning on your own?
 - b. Working alone vs with others (e.g. workout partner)?
 - c. Ways to stay motivated?
5. **NCOPD 4X6.** [Show them a copy of the NCOPD 4X6.] We would like to talk about capabilities in each of these NCO competency areas in which you either have learned something on your own, or would like to. [For Trainers: Provide copy of Military Education by NCOPD 4X6 categories and Military Education by self-learning skills. We would like to talk about which NCO competency areas and learning strategies are covered in the course you are currently teaching. a) Which of these competencies are taught and in what way? b) The second table lists some skills important for self-learning. I'll describe a category from the table and would like to discuss the extent to which that skill is taught in the course you are currently teaching.]

- a. In each of these areas, what opinions do you have concerning which ones are more amenable to an NCO learning on his or her own?
 - b. What would you suggest as good learning strategies that could facilitate self-learning in these competency areas?
 - i. Technical competencies
 - ii. Tactical competencies
 - iii. Communication/Social skills
 - iv. Adaptive/creative/critical thinking
 - v. Self-learning skills
 - vi. Digital skills
 - vii. Army values
 - viii. Physical fitness
 - ix. Family/emotional fitness
6. **Coaching others.** Think of a time you counseled a lower ranking Soldier about self-learning strategies and/or learning skills he or she could use to enhance his or her job related knowledge and skill development.[For trainers: what self-learning strategies have you observed students using or taught students to use?]
- a. What advice did you give in that situation?
 - b. When you were a junior enlisted Soldier, what sorts of advice did your NCOs give you about learning on your own that you feel directly contributed to your ability to move up in rank within the NCO corps?
 - c. Are there any “if I knew then what I know now” types of recommendations you could give on self-learning strategies and/or learning skills?
 - d. Is there any specific advice that would be useful for Soldiers and NCOs at particular ranks? From whom could/should the Soldier or NCO seek this advice?
7. **Situational Supports/Barriers to Self-Learning.** [For Trainers, include supports and barriers they have seen for students.]
- a. What are the top 3 supports that help you learn things on your own?
 - b. What are the top 3 barriers that prevent you from learning things on your own?
 - c. What kind of support do you get from the Army for self-learning?

- d. In what ways have you sought feedback or used available tools to figure out what knowledge and skills you need to develop and to track your development? (e.g., NCOER, mentors, supervisors, peers, assessment tools)
- 8. End of interview questions - thank the Soldiers for their time.

APPENDIX D

FOCUS GROUP INTERVIEW PROTOCOL
(SECOND SET OF SESSIONS)

Strategies for Self-Learning in the Noncommissioned Officer Education System (NCOES)

Interview Protocol #2

Introductions

- Researchers
- ARI/PDRI

Project Background & Objectives

- We are conducting research to enhance the Army's understanding of the skills a successful NCO uses to engage in self-learning.
- We define self-learning as a situation in which an NCO takes responsibility on his or her own to learn a job-related concept, task, or skill. An NCO engages in self-learning to become more able to do a current job and/or an anticipated future job.
- There are certain skills that are associated with success in learning something on your own. The last time we were here we talked to NCOs about the strategies they use to learn things on their own. Now we are interested in learning more about the best way to teach those strategies to NCOs so that they will be set up for success in self-learning situations.
- Our goal is to develop an e-Handbook that will support Soldiers in developing self-learning skills and strategies as well as support leaders in guiding Soldiers to enhance their capability for self-learning. The e-Handbook will be made available to the NCO Corps and the Army by the Army's Institute for Non-Commissioned Officer Professional Development.
- Today, we will be asking you to think about certain self-learning skills and what you think is the best way to train or educate new Soldiers in these skills. We are trying to develop a roadmap for training NCOs in these areas. We hope that by everyone discussing this topic together it will help us to document the variety of ideas you all have as well as similarities and differences you see between your own and other NCOs' learning experiences.

Privacy Act & Informed Consent

- As we ask you questions, we would like to take notes and record your answers to help us remember what you said. However, to assure your personal privacy, we will not record your name in conjunction with your answers. We will analyze and report your responses as those of a group of successful Army NCOs, and not in terms of individuals.
- Hand out informed consent, explain the contents of the informed consent (including limitations on confidentiality) and see if they have any questions about it or the study.

Instructions for the Task

- Let's get started. Keep in mind as you describe your experiences that we do not need to know about specific names of the people and/or places involved. In addition:
 - Please do not discuss any illegal activities or operationally sensitive information that you may have witnessed. We cannot guarantee confidentiality in such instances.
 - This discussion is unclassified.
 - As you describe your experiences, we will ask follow up questions to ensure we have captured the details we need.
- After the interviews, thank the Soldiers for their time.

Notes to Interviewer:

- If the interviewer notes that illegal/unethical activity is being reported or operationally sensitive information is being disclosed, remind them that the information provided should be unclassified and that individuals in the room may be required to report illegal/unethical activities to the appropriate authorities.
- Any information received that the individual poses a threat to others, of child abuse or neglect, or abuse of the elderly or disabled, will be reported to the Judge Advocate General. Information that the individual poses a threat to one's self will be reported to the local chaplain or mental health services. For specific criminal offenses, the researcher will fulfill his or her obligation not to obstruct justice. That is, the individual will reveal information about criminal behavior disclosed during the interview when asked about it by the appropriate authorities, will not assist in the concealment of such information, and will not take steps that would assist the criminal in avoiding prosecution for the offense.

Interview Questions

Imagine a Self-Learning E-Handbook, and when you go to the site there would be a section called *Do you have what it takes to learn on your own?* When you click on that there would be additional buttons to click that said, *Skills You Will Need*, *Getting Motivated*, and *Getting the Right Attitude*.

What we would like to do is describe for you one of the self-learning skill areas, then have a discussion about the best way to provide training in that area (e.g., strategies to learn those skills, and what types of approaches will work).

1. The first area is *Self-Assessment*: In order to engage in self-learning, NCOs need to be able to identify areas in which they want to or should improve, and determine if they have the right "mindset" and organizational support to succeed in self-learning (e.g., motivational deficits - self-efficacy, outcome expectations, learning orientation).

- a. There are a number of questionnaires that Soldiers could fill out to get an assessment for their learning readiness. If we included these, how would we need to set this section up to be the most helpful? Should this be supervisor-guided? How should results be presented?
- b. When we spoke with some Soldiers in the last round of focus groups they indicated they did not have experience with identifying an area to learn on their own. How can we help NCOs learn how to identify areas for self-learning? Should we create a self-assessment tool? Get peer assessments?
- c. Would it be useful to organize help around common times that Soldiers need to SL? E.g. have a button to click that says *Starting a new job?* Or *On the hook to teach something new?*
- d. What can leaders do to facilitate this process? How can leaders in the organization create a good context for self-learning in their unit? (e.g., reward learning)

2. The second area is **Preparing to Learn:** Once Soldiers have identified an area for self-development they need to set goals and identify good learning resources and learning experiences. We would like to provide Soldiers with an example of how to do this in a specific area – e.g. Land Navigation.

- a. What topic would serve as a good example?
- b. What would be good goals for [land navigation/other]?
- c. What are good resources for learning [land navigation/other]?
- d. What are good experiences they could engage in to learn [land navigation/other]?
- e. How should they choose among the options?
- f. How can we guide leaders to support Soldiers in setting goals and identifying resources?

3. The third area is **Selecting Learning Strategies:** Once the Soldiers have identified an area that needs to be learned, then set some goals and identified possible resources, the next step is to engage in self-learning. There are four key categories of learning strategies that are helpful during self-learning: self-control strategies, task-based strategies, self-monitoring one's learning, and self-modifying strategies. Self-control strategies include (1) seeking information, (2) self-instruction, (3) imagery, (4) attention-focusing, (5) goal-setting, and (6) seeking social support.

- a. How could a Soldier leverage the support of others in the quest to teach him/herself [land navigation/other]?
- b. Task-based learning strategies reduce tasks to their essential elements and reorganize the parts. One very important task-based strategy involves elaborating and transforming the learning material to make it personally meaningful. How could a Soldier apply this to learning [land navigation/other]?

4. The fourth area is *Selecting Self-Monitoring Strategies*: While the Soldier is engaged in self-learning, there are a number of skills he/she can use to monitor success. This includes developing metacognitive skills, selecting self-monitoring learning strategies, and self-modifying learning strategies.

a. What type of tools would it be useful to provide Soldiers with on the website that would help them monitor their learning progress? (e.g. XL spreadsheet for tracking).

5. The next area is *Evaluating Learning*: Related to the previous topic, we are interested in specific ways you have assessed the knowledge and skills you learned.

a. Did you focus on job-related successes (you accomplished the assigned task), seeking feedback on your performance from superiors, peers, and/or subordinates, etc., or something else? In what ways did you “test” yourself to evaluate how well you learned what you set out to learn?

b. How did you use the information you sought/received about what you learned and/or your performance of the task?

c. What recommendations would you give other NCOs about how to evaluate their own learning process and outcomes that we could include in the eHandbook?

6. *Motivation to Self Learn*: This includes perceptions of the need to self-develop, job involvement, career motivation, organizational commitment, perceived organizational support, perceived benefits of self-development.

a. In what ways could we convince Soldiers of the need to self-develop?

b. What could we describe in the eHandbook as the benefits of self-development?

c. What type of organizational support would be needed to motivate Soldiers to self-learn?

d. How can we help Soldiers stay motivated while working to achieve a self-learning goal?

7. Attitudes, Beliefs, Traits

a. What negative/unhelpful attitudes/beliefs would Soldiers likely have and how could we counter those in the eHandbook?

8. Given our discussion, what would you like to see in an e-Handbook focused on self-learning strategies? What would you like included in an e-Handbook that you could refer to when counseling your Soldiers about self-learning to enhance work performance?

9. Are there any civilian books or other media that you would recommend as being particularly helpful to you in developing your self-learning strategies and skills during your career?

End of interview questions - thank the Soldiers for their time.

APPENDIX E

BACKGROUND INFORMATION FORM

**NCO Self-Learning
Background Information Form**

- (1) What is your current age? _____ years
- (2) How many years of military service do you have? _____ years
- (3) Are you male or female? Male Female
- (4) What is the highest level of civilian education you have completed?
- ___ Some high school
 - ___ GED or High School Diploma
 - ___ Some college
 - ___ Bachelor's degree
 - ___ Some graduate school credits
 - ___ Master's degree, Doctorate or professional degree, such as MD, DDS, or JD
- (5) What is your current assignment? **MARK ALL THAT APPLY**
- ___ Warrior Leader Course (WLC) ___ Instructor
 - ___ Advanced Leader Course (ALC) ___ Student
 - ___ Senior Leader Course (SLC) ___ Other _____
 - ___ Sergeant Major Course (SMC)
- (6) What is your current rank?
- ___ CPL/SPC ___ MSG/1SG
 - ___ SGT ___ SGM/CSM
 - ___ SSG ___ Other _____
 - ___ SFC
- (7) What is your MOS? _____
- (8) Please list any additional MOSs you have _____ [added for questionnaire-based data collection]
- (9) Which of the following describes your status?
- ___ Active Duty
 - ___ National Guard
 - ___ Army Reserve
- (10) Which of the following best describes your current career intentions in the Army?
- ___ Definitely stay until retirement.
 - ___ Probably stay until retirement.
 - ___ Definitely stay beyond my current obligation, but not necessarily until retirement.
 - ___ Probably stay beyond my current obligation.
 - ___ Probably leave upon completion of my current obligation.
 - ___ Definitely leave after completing of my current obligation.

APPENDIX F

ITEM AND FACTOR LEVEL PSYCHOMETRIC ANALYSES

Reliability Analyses

The reliabilities of the overall Self-Learning Questionnaire and the five thematic factors were ‘very good’ to ‘excellent’ in accord with customary coefficient alpha (α) criteria in the behavioral and social sciences (e.g., $\alpha=0.70$ and above; Schmitt, 1996). Table F.1 describes the mean, standard deviation, skew, and kurtosis for the five thematic factors overall.

Table F.1
Mean, SD, Skew, and Kurtosis for Factors on the NCO Self-Learning Questionnaire

Strategic Factors	N	Skew (SD)	Kurtosis (SD)	Mean	SD
Attitudes/Motivations	1343	-0.495 (0.067)	-0.201 (0.134)	3.98	0.77
Planning/Analysis	1336	-0.256 (0.067)	-0.248 (0.134)	3.77	0.73
Information Seeking	1336	-0.246 (0.067)	-0.144 (0.134)	3.79	0.70
Sense-Making	1337	-0.066 (0.067)	-0.327 (0.134)	3.63	0.75
Evaluating Learning	1336	-0.286 (0.067)	-0.361 (0.134)	3.79	0.78

In order to calculate the factor ratings, means were calculated for equivalent items for the two scenarios. Related item means were then averaged to produce factor ratings. This approach allowed us to identify more general response preferences for the Strategies/Techniques factors (Planning and Analysis, Information Seeking, Sensemaking, and Evaluating Learning) and to check whether the distribution of ratings was normal. As the 8 Attitudes/Motivations items were only presented once on the questionnaire. The 8 items were averaged together to produce a mean factor rating. Skew and kurtosis for the respective factor ratings indicated that the distributions for the five factors were acceptable for psychometric purposes.¹⁴

Attitudes and Motivations

In relation to the first thematic factor—Attitudes and Motivations—the items were found to be stable. Table F.2 presents the Item-Total Correlation, Skew, Kurtosis, Mean, and SD at the item level for this factor, rank ordered by item mean. The response options for this scale were 1=Strongly Disagree; 2=Somewhat Disagree; 3=Neither Agree or Disagree; 4=Somewhat Agree; 5=Strongly Agree.

¹⁴ In psychometrics, ‘skew’ describes whether the ratings for a measure tend to be unusually high or unusually low; kurtosis describes whether the ratings for a measure clump together too much or are too spread out. Ideally, a measure has a normal distribution, meaning that the ratings are not too extreme (cf. Nunnally & Bernstein, 1997).

Table F.2

Item Characteristics for the Attitudes/Motivations Factor (Rank Ordered by Mean)

Attitudes/Motivations Items	Item-Total Correlation	Skew	Kurtosis	Mean	SD
I take responsibility to learn what I need to in order to be effective in my job	0.83	-0.700	-0.327	4.17	0.90
I never stop learning in order to stay knowledgeable	0.85	-0.565	-0.591	4.10	0.92
I keep working at learning something, even when it is difficult	0.85	-0.607	-0.353	4.06	0.93
I am always on the lookout for better ways to learn	0.86	-0.500	-0.638	4.06	0.91
I stay on the lookout for new experiences, challenges, and/or assignments	0.82	-0.456	-0.528	3.96	0.95
I understand failure is an opportunity to learn	0.71	-0.503	-0.502	3.90	1.01
I monitor what I am doing when I am learning	0.77	-0.353	-0.521	3.88	0.94
I seek out new problems to solve	0.71	-0.272	-0.439	3.70	0.97

The item-total correlations for this factor were good (above 0.40), and the skew and kurtosis indicated that the distribution of mean ratings was within the normal range. The Attitudes and Motivations item with the highest mean rating concerned taking responsibility for learning what is needed to be effective on the job (in the ‘Somewhat Agree’ to ‘Strongly Agree’ range), and the item with the lowest mean rating concerned seeking out problems to solve (in the ‘Neither Agree or Disagree’ to ‘Somewhat Agree’ range).

Planning and Analysis

For the second thematic factor—Planning and Analysis—the items were also found to be stable. Table F.3 presents the Item-Total Correlation, Skew, Kurtosis, Mean, and SD at the item level for this factor, rank ordered by item mean. The response options for this scale were 1=Not Relevant; 2=Somewhat Relevant; 3=Relevant; 4=Very Relevant; 5=Essential.

Table F.3

Mean and SD of Strategies Associated with the Planning and Analysis Factor

Planning and Analysis Items	Item-Total Correlation	Skew	Kurtosis	Mean	SD
Identifying what I hope to be able to do as a result of what I am learning	0.80	-0.426	-0.286	3.88	0.83
Prioritizing learning tasks and/or topics that need to be covered	0.85	-0.389	-0.270	3.86	0.83
Clearly defining what I needed to learn when beginning the learning process	0.76	-0.362	-0.502	3.85	0.87
Planning step-by-step what I need to do in working toward my goal	0.83	-0.479	-0.188	3.81	0.88
Setting a deadline to complete my learning task and/or produce a product (e.g., a briefing)	0.74	-0.407	-0.279	3.76	0.90
Breaking down my overall learning task into smaller, manageable parts	0.80	-0.239	-0.469	3.73	0.83
Planning how to pace my learning to minimize conflict with my other obligations	0.78	-0.411	-0.143	3.70	0.90
Developing a time-line, roadmap, or list of milestones and use them to track my progress	0.74	-0.291	-0.416	3.58	0.96

Again, the Item-Total Correlations for the Planning and Analysis factor were good (above 0.40), and the skew and kurtosis were within normal parameters. The item rated most relevant by NCOs concerned identifying what they needed to do as a result of what they are learning, and the least relevant item concerned developing a time-line, roadmap, or list of milestones to track progress. Both the highest and lowest rated items were in the 'Relevant' to 'Very Relevant' range.

Information Seeking

The third factor, which concerned items related to the Information Seeking theme, was found to be stable, with acceptable item-total correlations and skew and kurtosis within acceptable parameters. Table F.4 presents the Item-Total Correlation, Skew, Kurtosis, Mean, and SD at the item level for this factor, rank ordered by item mean. The response options for this scale were 1=Not Relevant; 2=Somewhat Relevant; 3=Relevant; 4=Very Relevant; 5=Essential.

Table F.4

Mean and SD of Strategies Associated with the Information-Seeking Factor

Information-Seeking Items	Item-Total Correlation	Skew	Kurtosis	Mean	SD
Seeking opportunities to learn things hands-on; getting someone to show me	0.73	-0.596	-0.090	4.04	0.82
Collecting examples of completed work (e.g., briefings, NCOERs) to use as a model	0.77	-0.483	-0.249	3.95	0.83
Thinking about experiences I have had (or examples I know about) to help me make sense of what I am learning	0.76	-0.346	-0.303	3.90	0.79
Identifying my most likely sources of good information (e.g., libraries, Google, CALL)	0.75	-0.375	-0.296	3.86	0.84
Keeping a list, spreadsheet, notebook, etc., to track the resources I have collected and read	0.67	-0.295	-0.368	3.52	0.97
Supporting my learning with computer programs, CDs, videos (e.g., language learning software)	0.62	-0.221	-0.434	3.47	0.97

It is interesting to note that both for the interviews and for the questionnaire, NCOs emphasized their preference for learning hands-on. On the questionnaire, the highest rated item for the Information Seeking factor was “Seeking opportunities to learn things hands-on; getting someone to show me,” which was rated in the ‘Very Relevant’ to ‘Essential’ range. The least preferred Information Seeking strategy related to supporting learning by using computer programs, CDs, videos, etc., which was rated in the ‘Relevant’ to ‘Very Relevant’ range.

Sensemaking

Sensemaking, the fourth factor, had reasonable item-total correlations (above 0.40). Kurtosis and skew indicated that the means were within acceptable range. Table F.5 presents the Item-Total Correlation, Skew, Kurtosis, Mean, and SD at the item level for this factor, rank ordered by item mean. The response options for this scale were: 1=Not Relevant; 2=Somewhat Relevant; 3=Relevant; 4=Very Relevant; 5=Essential.

Table F.5

Mean and SD of Strategies Associated with the Sensemaking Factor

Sensemaking Items	Item-Total Correlation	Skew	Kurtosis	Mean	SD
Spending extra time focusing on information that seems new, unusual, or confusing	0.75	-0.392	-0.186	3.81	0.86
Seeking out different alternatives and points-of-view to help challenge/verify what I am learning	0.76	-0.253	-0.398	3.77	0.83
Summarizing what I am learning in my own words	0.78	-0.223	-0.484	3.64	0.90
Using mental imagery to play out 'what if' scenarios and/or to rehearse procedures	0.74	-0.203	-0.318	3.56	0.91
Diagramming/white-boarding concepts and processes to understand them better	0.70	-0.213	-0.264	3.37	0.97

The most emphasized Sensemaking strategy concerned spending additional time focusing on new, unusual, or confusing information, and the least emphasized strategy concerned diagramming or white-boarding concepts and process to increase understanding. Both were rated in the 'Relevant' to 'Very Relevant' range.

Evaluating Learning

The fifth, and final, factor was Evaluating Learning. The item-total correlations, skew, and kurtosis for the factor were all within acceptable ranges. Table F.6 presents the item-total correlation, skew, kurtosis, mean, and standard deviation at the item level for this factor, rank ordered by item mean. The response options for this scale were 1=Not Relevant; 2=Somewhat Relevant; 3=Relevant; 4=Very Relevant; 5=Essential.

Table F.6

Mean and SD of Strategies Associated with the Evaluating Learning Factor

Evaluating Learning Items	Item-Total Correlation	Skew	Kurtosis	Mean	SD
Asking trained Cadre/SMEs for advice and feedback on my performance	0.74	-0.443	-0.396	3.90	0.87
Evaluating how well I was able to achieve my learning goals	0.82	-0.331	-0.324	3.81	0.86
Seeking opportunities to teach/explain to others what I have learned	0.79	-0.402	-0.203	3.81	0.86
Assessing my progress in terms of the Army's 'crawl, walk, run'	0.74	-0.365	-0.349	3.65	0.96

The item rated most relevant dealt with seeking feedback on performance from trained Cadre and/or SMEs, and the item rated least relevant dealt with assessing progress in terms of the Army's 'crawl, walk, run' levels of performance. All items fell between ratings of 'Relevant' and 'Very Relevant.'

APPENDIX G

**SELF-LEARNING STRATEGIES QUESTIONNAIRE RESULTS BY
DEMOGRAPHIC VARIABLES**

NCO Rank

Given the excellent response we received from the Army NCO Academies, we were able to collect data across all NCO ranks. To simplify our analyses, NCO ranks were grouped into three categories in terms of Junior Ranks (CPL/SPC and SGT; $n = 680$), Middle Ranks (SSG and SFC; $n = 559$), and Senior Ranks (MSG/1SG and SGM/CSM; $n = 81$). Multivariate Analysis of Variance (MANOVA) with Bonferroni post-hoc tests were used to analyze the data for differences among the three groups.

We expected that NCOs that were more senior would emphasize Planning and Analysis strategies, a concern that would emerge with the greater responsibilities and competing demands that accompany more senior rank. More junior NCOs would emphasize Information Seeking and Sensemaking strategies, as they are exposed to a large volume of new learning requirements. Evaluating Learning and Attitudes and Motivations would not differ between the NCO Rank groups.

At the factor level, the overall model indicated statistically significant differences among the groups for Sensemaking, $F(2,1317) = 5.29$, $p = .005$, $\eta^2_p = .008$. Junior Rank NCOs ($M = 3.69$; $SD = 0.78$) tended to view Sensemaking Strategies as significantly more relevant to their self-learning process than did Middle Rank NCOs ($M = 3.58$; $SD = 0.71$) and Senior NCOs ($M = 3.47$; $SD = 0.79$). In addition, Middle Rank NCOs tended to view Sensemaking Strategies as significantly more relevant to their self-learning strategy than did Senior Rank NCOs. No support was found for our expectation concerning Senior NCOs emphasizing Planning and Analysis strategies.

An item-level analysis indicated three Attitudes/Motivations and five Strategies/Techniques items were significantly different among the three groups. These items and associated Means (SDs) by NCO Rank Group are presented in Table G.1.

Table G.1

Statistically Significant Item Level Means and Standard Deviations by NCO Rank

Factor/Item	Junior Rank (CPL/SGT) <i>Mean</i> <i>SD</i>	Middle Rank (SSG/SFC) <i>Mean</i> <i>SD</i>	Senior Rank (MSG/1SG/ SGM/CSM) <i>Mean</i> <i>SD</i>
<u>Attitudes/Motivations</u>			
• I keep working at learning something, even when it is difficult	3.99 0.98	4.11 0.88	4.28 0.78
• I never stop learning in order to stay knowledgeable	4.05 .096	4.12 0.87	4.38 0.85
• I take responsibility to learn what I need to in order to be effective in my job	4.09 0.94	4.21 0.86	4.53 0.71
<u>Planning and Analysis</u>			
• Planning how to pace my learning to minimize conflict with other obligations	3.76 0.90	3.66 0.89	3.54 0.96
<u>Information Seeking</u>			
• Supporting my learning with computer programs, CDs, videos (e.g. language learning software)	3.54 0.98	3.40 0.94	3.33 0.99
• Keeping a list, spreadsheet, notebook, etc., to track the resources I have collected and read	3.61 0.95	3.42 0.96	3.28 1.07
<u>Sensemaking</u>			
• Diagramming/whiteboarding concepts and processes to understand them better	3.44 0.98	3.30 0.94	3.11 1.01
• Using mental imagery to play out ‘what if’ scenarios and/or to research procedures	3.65 0.90	3.48 0.92	3.28 0.85

For the three Attitudes/Motivations items, there is an increase in endorsement of the items for each subsequent NCO Rank Group, whereas for the Strategies/Techniques items, there is a decrease across each subsequent Group. This finding suggested that as NCOs become more Senior, they may become more motivated to learn on their own as well as more selective in the strategies/techniques that they prefer to apply when learning on their own. This hypothesis was tested by calculating the coefficient of variation ($CFvar$)¹⁵ across all Attitudes/Motivation and Strategies/Techniques items on the Questionnaire for each NCO. A higher rating indicated greater variation in how NCOs endorsed items related to a factor and a lower rating indicates less variation in how NCOs endorsed items related to a factor. The measure of $CFvar$ for the questionnaire indicated statistically significant differences across the three groups, $F(2,1328) = 8.04$, $p = .000$, $\eta^2_p = .012$. There were no significant differences between Junior Rank NCOs

¹⁵ The coefficient of variation was calculated by dividing the standard deviation of a set of ratings by the mean; it is most often used as a measure of signal-to-noise.

($CFvar = 0.15$) and Middle Rank NCOs ($CFvar = 0.16$), however, Senior Rank NCOs ($CFvar = 0.19$) indicated greater variation in the Attitudes/Motivation and Strategies/Techniques endorsed compared to Junior Rank and Middle Rank NCOs. One way to interpret increased variation is in terms of senior NCOs being more selective about their relevance ratings of the various learning strategies for the scenarios presented. With the greater experience that is associated with higher rank, Senior NCOs may have developed more selective and individualized learning preferences; they may be more sure which techniques work for them and which do not.

Age

To simplify our analyses, NCOs were divided into three Age Groups: 19 to 29 years old ($n=630$), 30 to 39 years old ($n=464$), and 40+ years old ($n=232$). MANOVA with Bonferroni post hoc tests were used to test for significant effects for each of the factors. We expected that older NCOs will emphasize Planning and Analysis strategies, whereas younger NCOs will emphasize Information Seeking and Sensemaking. The rationale for this is similar to that outlined previously regarding NCO Rank. Older NCOs have increased competing demands on their time, whereas younger NCOs are being exposed to more information that is new.

Two statistically significant differences were found among the three groups. These were for the Planning and Analysis factor, $F(2,1323) = 3.12, p = .044, \eta^2_p = .005$, and the Sensemaking factor, $F(2,1323) = 3.07, p = .047, \eta^2_p = .005$. For Planning and Analysis, post hoc tests indicated significant differences between NCOs in the 30 to 39 year old group ($M=3.74; SD=0.70$) and NCOs in the 40+ year old group ($M=3.88; SD=0.71$). However, there were no significant differences indicated between NCOs in the 19 to 29 year old group ($M=3.76; SD=0.77$) and the other two groups. This provides partial support for what we had expected. For the Sensemaking factor, there was a statistically significant difference between the 19 to 29 year old group ($M=3.68; SD=0.77$) and the 30 to 39 year old group ($M=3.56; SD=0.74$), but not between the 40+ year old group ($M=3.64; SD=0.72$) and the other two groups. Again, this finding provided some partial support to our expectation, but the pattern of results leave much to be explained.

At the item level, there was one significant difference for Attitudes and Motivations items and five significant differences for Strategies and Techniques items. These items and associated Means (SDs) by NCO Age Group are presented in Table G.2.

Table G.2

Statistically Significant Item Level Means and Standard Deviations by NCO Age Groups

Factor/Item	19 to 29 Years <i>Mean</i> <i>SD</i>	30 to 39 Years <i>Mean</i> <i>SD</i>	40+ Years <i>Mean</i> <i>SD</i>
<u>Attitudes/Motivations</u>			
• I take responsibility to learn what I need in order to be effective in my job	4.12 0.93	4.14 0.88	4.33 0.84
<u>Planning and Analysis</u>			
• Breaking down my overall learning task into smaller, manageable parts	3.72 0.86	3.66 0.79	3.88 0.82
• Planning step-by-step what I need to do in working toward my goal	3.82 0.90	3.75 0.86	3.93 0.86
• Developing a time-line, roadmap, or list of milestones and use them to track my progress	3.54 1.01	3.53 0.90	3.75 0.93
<u>Information Seeking</u>			
• Keeping a list, spreadsheet, notebook, etc., to track the resources I have collected and read	3.57 0.98	3.42 0.93	3.54 1.00
<u>Sensemaking</u>			
• Using mental imagery to play out ‘what if’ scenarios and/or to rehearse procedures	3.63 0.92	3.48 0.92	3.49 0.85

Time in Service

NCOs reported the number of years they have been in the service, which we coded into four general categories: 1 to 4 Years ($n=337$), 5 to 9 Years ($n=373$), 10 to 14 Years ($n=293$), and 15+ Years ($n=321$). MANOVA with Bonferroni post hoc tests were used to test for significant effects across the four groups for five factors. We expected that NCOs in the 10 to 14 Years and the 15+ Years groups would emphasize Planning and Analysis, whereas NCOs in the 1 to 4 Year and 5 to 9 Year groups would emphasize Information Seeking and Sensemaking strategies. There were no differences expected for the Attitudes and Motivations and the Evaluating Learning factors.

Statistically significant differences were indicated for three of the five factors. These were for Planning and Analysis, $F(3,1320) = 3.33$, $p = .019$, $\eta^2_p = .008$, for Information Seeking, $F(3,1320) = 2.97$, $p = .031$, $\eta^2_p = .007$, and for Sensemaking, $F(3,1320) = 5.43$, $p = .001$, $\eta^2_p = .012$.

For Planning and Analysis, a post hoc test indicated a statistically significant difference between NCOs with 1 to 4 years ($M=3.86$; $SD=0.74$) in the Army, and those with 10 to 14 years

($M=3.69$; $SD=0.71$). No other significant differences were indicated for NCOs with 5 to 9 years of service ($M=3.74$; $SD=0.79$) and those with 15+ years of service ($M=3.80$; $SD=0.68$) for the Planning and Analysis factor. This effect indicates a trend opposite of what we had expected.

A post hoc test indicated that effects for the Information Seeking factor were only marginally significant after correcting the p-value for multiple comparisons. There were two marginally significant differences between NCOs with 1 to 4 Years ($M=3.89$; $SD=0.72$) and NCOs with 10 to 14 Years ($M=3.75$; $SD=0.67$) and with 15+ Years ($M=3.76$; $SD=0.64$). There were no significant differences between NCOs with 5 to 9 Years ($M=3.77$; $SD=0.75$) and any other group. This finding provides partial and tentative support for our expectation.

Finally, post hoc tests for the Sensemaking factor indicated statistically significant differences between NCOs with 1 to 4 Years Army experience ($M=3.76$; $SD=0.77$) and NCOs with 10 to 14 Years ($M=3.55$; $SD=0.73$) and with 15+ Years ($M=3.56$; $SD=0.70$), but no significant difference between NCOs with 10 to 14 Years and 15+ Years. There was no significant difference between NCOs with 5 to 9 Years ($M=3.63$; $SD=0.79$) and any other group. At the item level, no significant differences were found for items related to attitudes and motivations, but 12 significant differences were found for items related to self-learning strategies and techniques. These items and associated means (SDs) by NCO Age Group are presented in Table G.3. This finding provides partial support for our expectation.

Table G.3
Statistically Significant Item Level Means and Standard Deviations by Time in Service

Factor/Item	1 to 4 Years <i>Mean</i> <i>SD</i>	5 to 9 Years <i>Mean</i> <i>SD</i>	10 to 14 Years <i>Mean</i> <i>SD</i>	15+ Years <i>Mean</i> <i>SD</i>
<u>Planning and Analysis</u>				
• Clearly defining what I needed to learn when beginning the learning process	3.94 0.87	3.80 0.91	3.75 0.87	3.91 0.83
• Breaking down my overall learning task into smaller, manageable parts	3.81 0.82	3.71 0.86	3.61 0.82	3.77 0.81
• Planning step-by-step what I need to do in working toward my goal	3.93 0.89	3.77 0.89	3.72 0.88	3.83 0.83
• Planning how to pace my learning to minimize conflict with my other obligations	3.84 0.89	3.70 0.93	3.61 0.90	3.65 0.86
• Prioritizing learning tasks and/or topics that need to be covered	3.98 0.82	3.85 0.88	3.72 0.83	3.89 0.77

Table G.3

Statistically Significant Item Level Means and Standard Deviations by Time in Service (continued)

Factor/Item	1 to 4 Years <i>Mean</i> <i>SD</i>	5 to 9 Years <i>Mean</i> <i>SD</i>	10 to 14 Years <i>Mean</i> <i>SD</i>	15+ Years <i>Mean</i> <i>SD</i>
<u>Information Seeking</u>				
• Identifying most likely sources of good information (e.g., libraries, Google, CALL)	3.96 0.85	3.83 0.89	3.78 0.82	3.85 0.77
• Supporting my learning with computer programs, CDs, videos (e.g., language learning software)	3.60 0.98	3.45 0.99	3.38 0.95	3.43 0.92
• Keeping a list, spreadsheet, notebook, etc., to track the resources I have collected and read	3.69 0.96	3.53 0.98	3.42 0.95	3.40 0.95
<u>Sensemaking</u>				
• Summarizing what I am learning in my own words	3.80 0.89	3.62 0.92	3.54 0.85	3.58 0.91
• Spending extra time focusing on information that seems new, unusual, or confusing	3.92 0.88	3.79 0.90	3.75 0.84	3.75 0.83
• Diagramming/whiteboarding concepts and processes to understand them better	3.49 0.95	3.39 1.00	3.27 0.94	3.28 0.95
• Seeking out different alternatives and points-of-view to help challenge/verify what I am learning	3.89 0.85	3.75 0.86	3.72 0.86	3.73 0.73
• Using mental imagery to play out ‘what if’ scenarios and/or to rehearse procedures	3.70 0.92	3.60 0.94	3.42 0.94	3.45 0.83

Gender

The Attitudes and Motivations, and Strategies and Techniques factors were analyzed by Gender (Male NCOs $n=1,167$; Female NCOs $n=153$). We did not expect there would be any differences between male and female NCOs on the five factors.

Four of the five factors indicated statistically significant differences. These were Attitudes and Motivations, $F(1,1318) = 5.05$, $p = .025$, $\eta^2_p = .004$, Planning and Analysis, $F(1,1318) = 6.70$, $p = .010$, $\eta^2_p = .005$, Information Seeking, $F(1,1318) = 3.87$, $p = .049$, $\eta^2_p = .003$, and Evaluating Learning, $F(1,1318) = 5.09$, $p = .024$, $\eta^2_p = .004$.

Across the four factors, females rated the items as higher in relevance to them than did males. For Attitudes and Motivations, female NCOs ($M = 4.11$; $SD = 0.82$) rated items higher

than male NCOs ($M = 3.98$; $SD = 0.76$). For Planning and Analysis, female NCOs ($M = 3.92$; $SD = 0.80$) rated items higher than male NCOs ($M = 3.76$; $SD = 0.72$). This pattern held for Information Seeking, with female NCOs ($M = 3.90$; $SD = 0.75$) versus male NCOs ($M = 3.78$; $SD = 0.69$), and for Evaluating Learning, with female NCOs ($M = 3.93$; $SD = 0.82$) versus male NCOs ($M = 3.78$; $SD = 0.77$). These differences may indicate an area for further research.

Item level analyses by Gender indicated four statistically significant differences for Attitudes and Motivations, and 10 statistically significant differences in Strategies and Techniques. Table G.4 presents the significant items and associated means (M) and standard deviations (SD), comparing Male and Female NCOs.

Table G.4
Statistically Significant Item Level Means and Standard Deviations by Gender

Factor/Item	Female <i>Mean</i> <i>SD</i>	Male <i>Mean</i> <i>SD</i>
<u>Attitudes and Motivations</u>		
• I stay on the lookout for new experiences, challenges, and/or assignments	4.15 0.91	3.93 0.95
• I understand failure as an opportunity to learn	4.15 1.00	3.87 1.01
• I am always on the lookout for better ways to learn	4.21 0.90	4.04 0.91
• I monitor what I am doing when I am learning	4.12 0.97	3.85 0.93
<u>Planning and Analysis</u>		
• Clearly defining what I needed to learn when beginning the learning process	4.04 0.94	3.83 0.86
• Identifying what I hope to be able to do as a result of what I am learning	4.01 0.87	3.86 0.82
• Breaking down my overall learning task into smaller, manageable parts	3.85 0.89	3.71 0.82
• Planning step-by-step what I need to do in working toward my goal	4.00 0.90	3.79 0.87
• Planning how to pace my learning to minimize conflict with my other obligations	3.86 0.99	3.68 0.89
• Prioritizing learning tasks and/or topics that need to be covered	4.02 0.88	3.84 0.83
<u>Information Seeking</u>		
• Keeping a list, spreadsheet, notebook, etc., to track resources I have collected and read	3.70 1.00	3.49 0.96

Table G.4
Statistically Significant Item Level Means and Standard Deviations by Gender (continued)

Factor/Item	Female Mean SD	Male Mean SD
<u>Sensemaking</u>		
• Spending extra time focusing on information that seems new, unusual, or confusing	3.94 0.97	3.79 0.85
• Seeking out different alternatives and points-of-view to help challenge/verify what I am learning	3.96 0.84	3.75 0.82
<u>Evaluating Learning</u>		
• Ask trained Cadre/SMEs for advice and feedback on my performance	4.08 0.88	3.89 0.87

Career Management Field

Three Army Career Management Fields were represented in the NCO sample. These were Combat Arms ($n = 554$), Combat Service ($n = 286$), and Combat Service Support ($n = 477$). This analysis was exploratory; no expectations for the results were established. MANOVA with Bonferroni post hoc tests indicated significant differences among the groups for all five factors: Attitudes and Motivations [$F(2,1314) = 6.69, p = .001, \eta^2_p = .010$]; Planning and Analysis [$F(2,1314) = 7.51, p = .001, \eta^2_p = .011$]; Information Seeking [$F(2,1314) = 6.13, p = .002, \eta^2_p = .009$]; Sensemaking [$F(2,1314) = 4.11, p = .017, \eta^2_p = .006$]; and Evaluating Learning [$F(2,1314) = 7.92, p = .000, \eta^2_p = .012$].

For Planning and Analysis, Information Seeking, Sensemaking, and Attitudes and Motivations, Combat Arms and Combat Service Support consistently showed statistically significant differences, whereas Combat Service did not differ significantly from either of the other two groups. For the Evaluating Learning factor, the difference in ratings was statistically significant between both Combat Arms and Combat Service, and Combat Arms and Combat Service Support, whereas there was no statistically significant difference between Combat Service and Combat Service Support. NCOs in Combat Arms consistently rated the relevance of the various learning strategies lower than did NCOs in Combat Service and Combat Service support. These differences may be due to the close connection between the Career Management Fields and specific Military Occupational Specialties. Different areas of knowledge and practice may require different approaches to learning. An area of further research is indicated, with a focus on the self-learning strategies applied by Combat Arms related MOSs specifically. In Table G.5, the means and standard deviations for each of the self-learning factors are presented by Career Management Field.

Table G.5
Self-Learning Factors Overall by Career Management Field

CMF	Self-Learning Factors				
	Planning and Analysis <i>Mean (SD)</i>	Information- Seeking <i>Mean (SD)</i>	Sensemaking <i>Mean (SD)</i>	Evaluating Learning <i>Mean (SD)</i>	Attitudes and Motivations <i>Mean (SD)</i>
Combat Arms	3.69 (.71)	3.72 (.68)	3.56 (.72)	3.70 (.78)	3.89 (.75)
Combat Service	3.81 (.68)	3.83 (.68)	3.69 (.75)	3.87 (.72)	4.03 (.76)
Combat Service Support	3.86 (.77)	3.86 (.74)	3.69 (.79)	3.87 (.79)	4.06 (.79)

Item level analyses indicated a large number of statistically significant differences among the three groups. The learning strategies that were most consistent across the three groups were:

- I seek out new problems to solve
- Identifying what I hope to be able to do as a result of what I am learning
- Breaking down my overall learning task into smaller, manageable parts
- Thinking about experiences I have had (or examples I know about) to help me make sense of what I am learning
- Supporting my learning with computer programs, CDs, videos (e.g., language learning software)
- Summarizing what I am learning in my own words
- Diagramming/white-boarding concepts and processes to understand them better
- Using mental imagery to play out ‘what if’ scenarios and/or to rehearse procedures
- Assessing my progress in terms of the Army’s ‘crawl, walk, run’

Table G.6 describes the items that were found to differ significantly among the three groups. Means and SDs are presented for each of the Career Management Field groups.

Table G.6
Statistically Significant Item Level Means and Standard Deviations by Career Management Field

Factor/Item	Combat Arms <i>Mean</i> <i>SD</i>	Combat Service <i>Mean</i> <i>SD</i>	Combat Service Support <i>Mean</i> <i>SD</i>
<u>Attitudes/Motivations</u>			
• I stay on the lookout for new experiences, challenges, and/or assignments	3.84 0.95	4.05 0.90	4.04 0.96
• I keep working at learning something, even when it is difficult	3.97 0.92	4.13 0.87	4.13 0.96
• I understand failure is an opportunity to learn	3.80 1.00	3.91 1.00	4.01 1.01
• I never stop learning in order to stay knowledgeable	4.00 0.90	4.18 0.91	4.17 0.94
• I take responsibility to learn what I need to in order to be effective in my job	4.08 0.91	4.16 0.91	4.27 0.88
• I am always on the lookout for better ways to learn	3.99 0.90	4.04 0.93	4.14 0.90
• I monitor what I am doing when I am learning	3.79 0.91	3.90 0.98	3.96 0.94
<u>Planning and Analysis</u>			
• Clearly defining what I needed to learn when beginning the learning process	3.77 0.86	3.86 0.84	3.94 0.90
• Planning step-by-step what I need to do in working toward my goal	3.74 0.85	3.87 0.84	3.88 0.93
• Planning how to pace my learning to minimize conflict with my other obligations	3.61 0.88	3.73 0.88	3.80 0.94
• Prioritizing learning tasks and/or topics that need to be covered	3.77 0.81	3.91 0.77	3.95 0.88
• Developing a time-line, roadmap, or list of milestones and use them to track my progress	3.45 0.95	3.64 0.88	3.69 1.00
• Setting a deadline to complete my learning task and/or produce a product (e.g., a briefing)	3.64 0.90	3.82 0.80	3.88 0.93

Table G.6
Statistically Significant Item Level Means and Standard Deviations by Career Management Field
(continued)

Factor/Item	Combat Arms <i>Mean</i> <i>SD</i>	Combat Service <i>Mean</i> <i>SD</i>	Combat Service Support <i>Mean</i> <i>SD</i>
<u>Information Seeking</u>			
• Identifying my most likely sources of good information (e.g., libraries, Google, CALL)	3.79 0.83	3.86 0.80	3.95 0.86
• Collecting examples of completed work (e.g., briefings, NCOERs) to use as a model	3.88 0.82	3.96 0.78	4.03 0.85
• Thinking about experiences I have had (or examples I know about) to help me make sense of what I am learning	3.83 0.78	3.97 0.76	3.93 0.83
• Seeking opportunities to learn things hands-on; getting someone to show me	3.98 0.82	4.05 0.81	4.11 0.82
• Supporting my learning with computer programs, CDs, videos (e.g., language learning software)	3.39 0.95	3.53 0.92	3.54 1.00
• Keeping a list, spreadsheet, notebook, etc., to track the resources I have collected and read	3.41 0.94	3.58 0.95	3.62 1.00
<u>Sensemaking</u>			
• Spending extra time focusing on information that seems new, unusual, or confusing	3.72 0.82	3.89 0.86	3.87 0.91
• Seeking out different alternatives and points-of-view to help challenge/verify what I am learning	3.70 0.80	3.81 0.82	3.85 0.86
<u>Evaluating Learning</u>			
• Asking trained Cadre/SMEs for advice and feedback on my performance	3.78 0.87	3.95 0.85	4.01 0.87
• Seeking opportunities to teach/explain to others what I have learned	3.74 0.85	3.87 0.82	3.87 0.90
• Evaluating how well I was able to achieve my learning goals	3.69 0.86	3.92 0.80	3.90 0.87

Duty Status

NCOs self-identified their membership in three Duty Status categories: Active Duty ($n=1,083$), Army Reserve ($n = 70$), and National Guard ($n = 167$). MANOVA was used to test for significant differences in the self-learning factor ratings by Duty Status. One marginally significant effect was found for Information Seeking ($p = 0.07$). At the item level, there were no significant effects.

Civilian Education

NCOs were grouped into three Civilian Education categories: GED/HS Diploma ($n = 313$), Some College ($n = 818$), and Bachelors or Higher Degree ($n = 186$). We expected that NCOs with Some College and those with a Bachelors or Higher Degree would rate the Strategies and Techniques factors as more relevant, but not the Attitudes and Motivation factor. The rationale for this is that with increased experience in higher education, NCOs would be more likely to acquire and refine skills related to learning on their own.

A significant effect was found for Civilian Education on the Attitudes and Motivations factor, $F(2,1314) = 10.14$, $p = .000$, $\eta^2_p = .015$. NCOs with Some College ($M = 4.03$; $SD = 0.73$) and those with a Bachelors Degree or Higher ($M = 4.06$; $SD = 0.77$) had statistically higher ratings on the Attitudes and Motivations scale than did NCOs with GED/HS Diploma ($M = 3.81$; $SD = 0.84$), but there were no statistically significant differences between NCOs with Some College and those with a Bachelors Degree or Higher. Our expectation had no support. However, this finding raises an interesting question concerning why having Some College or a Bachelors Degree or Higher would be related to an increase in Attitudes and Motivations ratings, but not in the relevance ratings of Strategies and Techniques directly related to the self-learning process. Keeping this in mind, the finding does suggest support for initiatives promoting college education as part of the overall professional development process for NCOs.

Item level analyses by Civilian Education indicated 6 statistically significant differences for Attitudes and Motivations, and 2 statistically significant differences for Strategies and Techniques. Table G.7 presents the significant items and associated means (M) and standard deviations (SD), comparing NCOs with GED/High School Degree, Some College, and Bachelors Degree or Higher.

Table G.7

Statistically Significant Item Level Means and Standard Deviations by NCO Civilian Education

Factor/Item	GED/High School Diploma <i>Mean</i> <i>SD</i>	Some College <i>Mean</i> <i>SD</i>	Bachelors Degree or Higher <i>Mean</i> <i>SD</i>
<u>Attitudes/Motivations</u>			
• I stay on the lookout for new experiences, challenges, and/or assignments	3.79 1.00	3.99 0.93	4.08 0.94
• I keep working at learning something, even when it is difficult	3.84 1.03	4.13 0.88	4.15 0.91
• I understand failure is an opportunity to learn	3.70 1.06	3.96 0.98	3.98 1.02
• I never stop learning in order to stay knowledgeable	3.94 0.98	4.13 0.89	4.24 0.91
• I take responsibility to learn what I need to in order to be effective in my job	3.93 0.97	4.23 0.86	4.29 0.88
• I am always on the lookout for better ways to learn	3.87 0.95	4.12 0.88	4.09 0.93
<u>Planning and Analysis</u>			
• Identifying what I hope to be able to do as a result of what I am learning	3.76 0.89	3.91 0.80	3.96 0.81
<u>Evaluating Learning</u>			
• Asking trained Cadre/SMEs for advice and feedback on my performance	3.81 0.92	3.91 0.86	4.01 0.83

Career Intentions

NCOs were grouped into two Career Intentions categories: NCOs who probably or definitely intended to leave after their current obligation ($n = 170$), and NCOs who probably or definitely intend to stay beyond their current obligation or until retirement ($n=1,154$). We expected that NCOs who intended to stay beyond their current obligation or until retirement would have higher ratings across the factors than NCOs who intend to leave after their current obligation. The rationale is that NCOs who intend to stay beyond their current obligation will be more engaged in self-learning in relation to their Army jobs, whereas NCOs intending to leave may be focused on exploring knowledge and skills related to other career options.

MANOVA was used to test for statistically significant differences between the groups for the five factors. Significant differences between the groups were found for all five factors: Attitudes and Motivations [$F(1,1322) = 22.88, p = .000, \eta^2_p = .017$]; Planning and Analysis [$F(1,1322) = 18.53, p = .000, \eta^2_p = .014$]; Information Seeking [$F(1,1322) = 18.98, p = .000, \eta^2_p =$

.014]; Sensemaking [$F(1,1322) = 11.51, p = .001, \eta^2_p = .009$]; Evaluating Learning [$F(1,1322) = 16.73, p = .000, \eta^2_p = .012$].

Across the five factors, NCOs who probably or definitely intend to stay with the Army through their current obligation or until retirement endorsed Attitudes and Motivations items more highly than did NCOs who intended to leave after their current obligation. This same pattern of results held for the Strategies and Techniques factors. At the item level, all item ratings were significantly different between the groups, except, “Using mental imagery to play out ‘what if’ scenarios and/or to rehearse procedures.” The findings supported our expectation. They further suggest that research may profitably explore in detail the relationship between NCOs’ attitude toward their jobs and their openness to engaging in self-learning activities.