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Training the Objective Force Warrior

New Soldier systems such as Land Warrior (LW) promise to greatly enhance the effectiveness of dismounted warriors and small units. The potential of these new technologies, to include future enhancements from the Objective Force Warrior (OFW) program, will only be realized if Soldiers and leaders are trained to fully exploit the new system capabilities.

The central component of the Land Warrior and the OFW-enhanced system is the Soldier-worn computer. This computer will allow Soldiers to receive, modify, and share information from an increasing variety of sources. As a result, training will largely focus on the development of cognitive decision-making skills. Soldiers and leaders must not only be trained on how to operate the new systems, but more importantly, on how to use the systems to make informed, rapid decisions.

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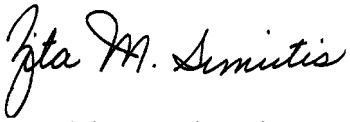
From the Director

The increasing complexity of Army operations, and the growing digitization of the battlefield and the training environment, require particular attention to the problem of optimizing training for new, digitized systems. Our lead article in this Newsletter deals with this challenge in the context of the Army's Objective Force Warrior concept and with the factors impacting the training of small units. Another important issue, dealt with in the second article, is that of Active/Reserve Component integration, of particular interest in an environment of extensive overseas operations. In other articles, we deal with distributed learning technologies and the effectiveness of text messaging as a communications mode; with optimizing instruction for the use of map displays; with adaptive performance skills for unconventional warfare, and with the effectiveness of the Army Continuing Education System. We also describe a significant methodological advance in survey-based research (Qualitative Data Input Application and Q-Code), which is already enhancing our ability to analyze survey responses in a more effective and timely manner. If there is an across-the-board theme to this sampling of our current work described here, it is the leveraging of technology to achieve efficiency and precision in training and operations, as well as in our own research program. There are various levels of focus and areas of concern, but in each case we are working at the interface between research findings and training models, and the evolving needs of the Army in it current and future multi-faceted environment.



Dr. Zita M. Simutis

Training the Objective Force Warrior

One of the goals of the Future Force is to reduce the differences between heavy, light, and special operations forces. In support of this, this article describes an effort to help raise the close combat fighting skills of Future Force small units to that of special operations units.

Training Small Unit Leaders and Teams STO

The work described is part of a four-year Science and Technology Objective (STO) in direct support of the OFW program. The purpose of the STO is to develop new training methods and performance measures required to exploit new Objective Force capabilities and high-tech equipment. The products will include guidelines and draft training support packages that can be used by the OFW Lead Technology Integrator for the Advanced Technology Demonstration train-up.

The purpose of this initial project is to identify issues of importance related to training and training technology strategies for the Army's Future Force, especially OFW-equipped dismounted combatants. Our principal approach was to capture close combat training and training technology lessons and approaches used by special operations units.

Method

We administered a questionnaire and conducted a detailed interview with nine senior active duty and recently retired non-commissioned officers. They were chosen because of their combat and training experience and their broad-based knowledge of various military occupational specialties. The majority had extensive experience in Army special mission units and had achieved the rank of sergeant major.

The interviews centered on training techniques that can be used to accelerate the learning process. The subject matter experts (SMEs) were asked to describe techniques that prepared Soldiers and small units for efficient and effective task accomplishment under life-threatening, fast-paced, and stressful conditions. Our primary focus was on non-commissioned officers and Soldiers. The issues presented below represent some of their highest priority concerns.

Soldier with simulator training program

Training Time

The SMEs identified the need to maximize the amount and quality of training time as their top issue. Training time was thought to become even more critical in the future. Soldiers at lower echelons will increasingly be required to perform more tasks and more complex tasks, i.e., to become more like special operations forces. Despite advances in automation and training technologies, the SMEs strongly believed that more training would be required, not less.

Another major impediment to effective use of small unit training time is training distracters. Major training distracters include higher echelon training exercises and post support. Not only does post support take away from training time, but the SMEs believed it had a significant negative impact on reenlistment.

It was suggested that small unit trainers should be prepared to use some distracters as training opportunities. For example, if the vehicles planned for movement do not show up, one can immediately execute the "bump plan," and, for example, conduct a forced march. Or if one of four trucks breaks down, make the troops decide how they best can continue to operate…What do they leave behind? Where do they place their crew served weapons?

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Training the Objective Force Warrior

Near future for dismounted combatants

"Hip-pocket" training is another way to maximize available training time. Small unit leaders should be prepared to deliver short 15-20 minute training sessions when opportunity permits. For example, be prepared to have Soldiers pull out their compasses for a quick lesson/review on compass use.

The SMEs stated that one of the reasons why hip-pocket training is no longer as prevalent as in past years is that printed copies of the Soldiers Manual of Common Tasks are no longer available. This is also true for Soldier job books, which were another tool for squad team leaders to plan hip-pocket training. ARI has, however, recently updated its popular *Combat Leader's Guide*, and will be available on the website which can aid hip-pocket training.

Train the Basics First

The overwhelming belief was that Soldiers who are being trained new skills should learn the fundamentals first. Lower levels of proficiency need to be built before moving forward with technological tools or shortcuts. While technology may enhance a Soldier's ability to perform a task, it often reduces the need to understand the basics, especially to perform at minimum levels of proficiency.

While technology alone may assist basic proficiency, understanding the fundamentals is often required for advanced or expert levels of performance. Understanding the basics is fundamental to innovation, and in developing field expedient solutions to unforeseen problems.

Skill Mastery – Walk and Run

As individual and collective proficiency increase, the pace of training should accelerate. In most cases that means the task conditions are made more difficult. Trainers can, for example, conduct training in various conditions of light, weather, wind or change the Soldier loads to increase task difficulty.

Good trainers know how to accelerate the pace or increase the difficulty of conditions to get optimum increases in performance. Factors affecting the optimum rate include: the technology, the simplicity of the task, the student's ability, instructor-to-student ratio, available training time, and safety.

For Soldiers and units to reach the highest levels of proficiency, the SMEs believed training should focus on the most difficult collective tasks. Some of the more difficult tasks identified, or ones normally trained less frequently include: casualty evacuation, prevention of fratricide, logistics/resupply, defense, operating in NBC conditions, controlling fires, avoiding minefields, and dealing with civilians on the battlefield.

Combat-Focused Training

A major point made by the SMEs was that training should always be combat-focused. Training should routinely immerse Soldiers in realistic, challenging tactical environments. Training events must include integrated stressors and a depth of realism down to the individual Soldier level. To the extent possible, nothing should be notional, not smoke, fire support, or casualty evacuation. All should be included in a realistic manner.

Emphasis should be placed on the unexpected "worst case scenarios." Troops should be pushed to exhaustion and then tasked to go further, faster, and fight harder, to accomplish the next mission. Hands on training exercises should include live fire, live explosives, heavy loads, medical treatment, evacuation drills, and fast-paced combat operations, such as are found at the Combat Training Centers. Simulations were cited as an effective means for training intermediate level skills.

Visualization

Visualization was frequently described as an important technique for skill mastery. Visualization refers to the Soldier having and actively cultivating an image of what is going to happen.

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Training the Objective Force Warrior

A Soldier must know what to do and how to do it, before he or she can do it correctly. Foremost, the Soldier must clearly know what correct (and later expert) performance looks like.

To accomplish this, trainers can show students an expert instructor demonstration or video. The use of video and video cameras was repeatedly suggested as a means to both demonstrate correct performance of the task and subtasks and to provide the Soldiers feedback on how they performed each task and subtask. It is often important to slow down the individual steps of a process as a means to demonstrate the proper sequence of events.

Conclusions

Many of the issues identified here echo the training lessons learned from the fielding of the first digital division and the Stryker Brigade Combat Teams. As the Army continues to transform to a more deployable, agile, and lethal force, we must remember that high-performance is rooted in being able to perform basic combat tasks quickly and accurately, and not necessarily in having the latest high-tech equipment.

It was clear from the interviews that no silver bullet is going to quickly revolutionize the training of OFW-equipped Soldiers. Time management, command of the basics, skill mastery, combat focus, visualization, repetition, and the use of simple job aids predominated the thinking of the SMEs. These are not new concepts, but they are critical. The major challenge is how to do them more effectively and efficiently.

For additional information, please contact Dr. Scott Graham, ARI—Infantry Forces Research Unit, ARI_IFRU@ari.army.mil.

Achieving Successful AC/RC Integration: A Tool Kit for Multi-Compo Unit Leaders

Source for access to information on a CD and Web links

Today's Active Component (AC) of the U.S. Army is at its lowest force structure level since World War II and about two-thirds its level since the Gulf War. Yet, as our country wages war on terrorism, mission commitments continue to grow at home and abroad. Success in this downsized environment depends, therefore, in large part on the AC's ability to take ever-greater advantage of its Reserve Component (RC), that is the Army National Guard (ARNG) and Reserve (USAR).

Well aware of this, the Army is bolstering its composite AC/RC capability through several dozen force integration initiatives. Not the least of which is the establishment of multiple-component units (MCUs) where AC and RC personnel and equipment are combined under a single authorization document (e.g., Modified Table of Organization and Equipment or Augmentation Table of Distribution).

For this MCU initiative to be successful, several prerequisites need to be in place. First, composite unit leaders must have working knowledge of the operational and cultural differences that exist between the AC and RC. Such knowledge will help to ensure these differences don't come as a surprise and adversely impact readiness. Second, unit leaders deserve to benefit from lessons learned by their predecessors on how best to minimize the potentially negative impact of intercomponent differences. Third, unit leaders must have ready access to the latest information available on how to foster mutual AC/RC Soldier trust and respect--a goal yet to be met, although critically important for achieving successful AC/RC integration, in general, and successful establishment of MCUs in particular. And lastly, leaders need information at their disposal to support the counseling of Soldiers on what they need to know and do before (after) arriving at their composite units so as to guarantee an efficient and productive (i.e., "seamless") transition.

In response to these needs, and an accompanying request by the Office of the Chief, Army Reserve, Program Analysis and Evaluation, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) has developed a Web-Interactive, compact disc (CD)-based tool kit containing a variety of USAR-related information included to help leaders, at corps through company level, meet the challenges of AC/RC integration encountered within an MCU environment.

This tool kit contains the following six sections of need-to-know information identified by, and accessible through, the action buttons on the left and right sides of the main menu screen shown in Figure 1:

Figure 1. Tool Kit Main Menu Screen

User interface for Web-Interactive CD-Rom

Section 1. A 36-page MCU Handbook of information included to help composite unit leaders develop a basic understanding of the USAR's cultural and operational environments, and to serve as a foundation for establishing realistic standard operating procedures (SOPs) for MCUs. The handbook contains valuable information on personnel, training, finance/funding, logistics, and mobilization planning, as well as half a dozen other areas of likely usefulness to composite unit leaders.

Section 2. Tips for achieving Successful Integration that cover the causes, effects, and recommended solutions to problems that may occur in an MCU

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Achieving Successful AC/RC Integration: A Tool Kit for Multi-Compo Unit Leaders

Trust Enhancers	
Areas	**Steps**
Performance and Competence	• Develop and display knowledge of AC and RC systems • Honor commitments and show results
Integrity	• Ensure your actions are consistent with your words • Stand up for your convictions • Stand behind the unit and its members • Communicate to keep everyone informed about progress • Show both sides of an issue
Concern for the well-being of others	• Help unit personnel with MCU transition • Be aware of your impact on others • Integrate your unit needs with those of other units and organizations

Figure 2. Ways for leaders to enhance trust and respect in their composite units

environment in the areas of command climate, personnel, training, logistics, and funding/finance. This section also includes specific steps that can be taken to foster mutual trust and respect among composite unit members (Figure 2) and information designed to help MCU leaders become better aware of the dual nature of the AC/RC command structure under which they must operate on a day-to-day basis.

Section 3. Sponsorship Tools for ensuring the seamless transition of USAR Soldiers newly assigned to an MCU. This section includes easy-to-use in-processing and unit sponsor checklists designed to help leaders take the wide range of steps necessary to integrate new Soldiers into their units as quickly and effectively as possible.

Section 4. Mobilization checklists to help composite unit leaders during each phase of the mobilization process (Planning, Alert, Home Station, Mobilization Station, Embarkation, and Demobilization).

Section 5. Links to the home pages of specific military organizations/installations and to a variety of miscellaneous websites containing AC/RC-integration-related information of potential use to composite unit leaders.

Section 6. A listing of informational Sources used during tool kit development to include, for example, electronic publication websites (e.g., Dennis J. Reimer Digital Library) and reference documents related to AC/RC integration (e.g., Army Regulations, DA Forms and Pamphlets, Field Manuals, a Generic Memorandum of Agreement for establishing an MCU, Training Circulars).

Each of these sections includes internal links to information contained locally on the CD, as well as external links to information contained on the World Wide Web. The linked information can be easily identified, and then viewed directly on line or downloaded to file for archiving or printing/distribution purposes. Finally, to save search time, the tool kit's underlying navigational structure has been constructed to enable ready access to most information from any starting point with only a minimal number of mouse clicks.

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Computer-based Strategies for Training Digital Map Displays

Effective training to leverage digital capabilities

The Army is transforming into a lighter, more mobile and lethal force. This transformation involves the fielding of digital information technologies. Computer-based training (CBT) is needed to give Soldiers and leaders the skill sets required to function effectively with digital systems. These CBT approaches should be based on principles of instructional design that have emerged from empirical investigations of CBT effectiveness.

The U. S. Army Research Institute for the Behavioral and Social Sciences (ARI), Infantry Forces Research Unit at Fort Benning, GA conducted a series of experiments that compared different ways to train some of the digital skills required by new systems. In the first experiment, we examined two issues regarding the design of CBT for digital map skills. These included how much material should be included in each lesson, i.e., the effect of memory load on learning. We also looked at the extent to which the instruction should be a highly structured vice giving Soldiers the flexibility to learn certain digital functions on their own.

The Soldiers learned seven digital map functions such as zoom, pan, determine range, and locate individuals and units. The CBT screens and exercises approximated the look and feel of Land Warrior (LW) software. Enlisted Soldiers and officers enrolled in courses at the U.S. Army Infantry School participated in the research. We found that smaller blocks of instruction, which created a lesser demand on working memory, resulted in higher learning regardless of Soldier's rank. Furthermore, the instructional approach that allowed the Soldiers to explore the map on their own was the least effective. The second experiment, described here, expanded on these CBT variations.

The Training Strategies

The research replicated the exploratory map made and the traditional lessons with exercises modes in the first experiment. Three new training modes were added. These were two forms of aided discovery, and a mode where Soldiers chose their own training method. With the exception of the exploratory condition, the seven functions were grouped into four blocks for the lessons and/or exercises.

- *Explore Map Only*. The Soldiers explored the map for 60 minutes with minimal guidance.

All seven map functions were operational. Soldiers were told which functions they had to learn and the purpose of each function. Soldiers received no feedback, and used their own judgment as to when to proceed to the map exam. This replicated the exploration condition in the first experiment.

- *Explore via Exercises*. This condition used an aided discovery learning technique. Soldiers learned the map functions from practical exercises with no formal lessons.

Within an exercise, they were presented several questions and given 15 minutes to work with the map to solve each question. Immediate corrective feedback on the Soldier's solution was given for each question.

- *Lessons then Explore*. This condition was another form of guided discovery. Soldiers had lessons, but no practical exercises.

After completing each lesson, Soldiers could explore the map for 15 minutes to work with the functions. No feedback or guidance was provided during this exploration. In essence, Soldiers were presented information on all the functions, and were then given the opportunity to apply that information by working interactively with the functions.

- *Lessons and Exercises*. This was a standard training approach incorporating lessons and exercises.

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Computer-based Strategies for Training Digital Map Displays

Following each lesson, the Soldiers had practical exercises with performance feedback. This replicated the traditional mode of training in the first prior experiment.

- *Self-Select*. This condition allowed the Soldiers to choose their training mode.

Soldiers could select the lesson, exercises, and/or to explore the map. They could select these options in any order and in any combination. They could also change their instructional preference for each block of material. This condition was included to determine whether such an approach could accommodate a diverse population of Soldiers, typical of those who will use the LW system.

What Worked

We trained and tested a total of 152 students from two U.S. Army Infantry School courses, the Infantry Officer Basic Course (IOBC) and Infantry One Station Unit Training (OSUT). Within each course, students were randomly assigned to one of the five CBT conditions.

The primary criterion measure was the score on a map exam. Consistent with the first experiment, there was a significant difference between the two courses. Overall, the officers from IOBC scored higher than the initial entry enlisted OSUT Soldiers (see Figure 1). There was also a significant difference between CBT conditions with the Explore Map Only scores being significantly lower than the other four conditions.

However, there was also a significant interaction between the courses and training conditions on the map exam. Performance in the Explore via Exercises and the Lessons and Exercises conditions was similar for IOBC and OSUT. Common to both conditions were exercises that required individuals to work with each function. In the

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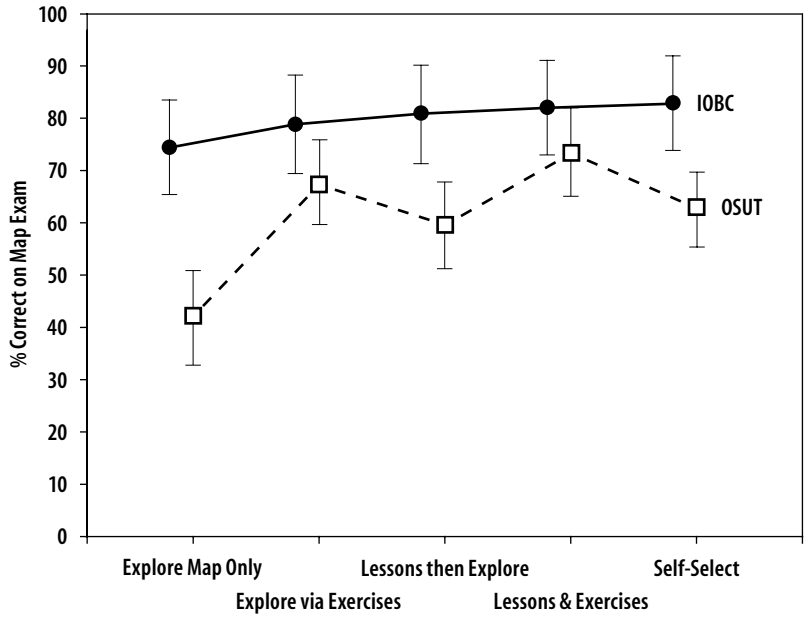
Computer-based Strategies for Training Digital Map Displays

Figure 1. Map exam scores by course and training condition.



other three conditions, the IOBC students scored significantly higher than OSUT students. These conditions, Explore Map Only, Lessons then Explore, and Self-Select, provided less structure and feedback. Only the Self-Select condition provided students the opportunity to obtain performance feedback, and then only when they selected the exercise mode of training.

There was agreement between the students' performance and their reaction to the training. Figure 1 shows that the OSUT students scored highest in the Lessons and Exercises condition, whereas the IOBC students scored highest in the Self-Select condition. Of interest is that all the OSUT students stated that the Lessons and Exercises condition was an effective method of training for them and that they liked it. Similarly, all the IOBC students stated the Self-Select condition was effective for them and that they liked it. On the other hand, the Explore Map Only condition was perceived the least favorably by both groups.

Conclusions

The CBT approaches varied in their effectiveness for the students in the two courses, particularly OSUT. It appeared that the OSUT students needed the structure and feedback provided by practical exercises, with or without lesson material. Although the performance of the IOBC students was relatively similar across conditions, the least structured mode, exploring the map, was the least effective for them as well. Giving IOBC students the option of selecting their mode of training proved to be effective, an outcome that was not necessarily expected.

We sometimes hear people say that all you need to do is give today's youth a computer game or a piece of software and they can quickly figure it out on their own. Our results do not support this claim. Also, the findings suggest that not everyone knows which training approach is best for them, as demonstrated by the difference between the IOBC and OSUT Soldiers under the Self-Select condition.

Individualized training is not a new goal. Exactly how to individualize training is a complex issue that needs to be addressed when the target population is diverse. The findings provide insights regarding what training techniques work well with different groups of Soldiers.

For additional information, please contact Dr. Jean Dyer, ARI—Infantry Forces Research Unit, ARI_IFRU@ari.army.mil.

Text Messaging for Effective Communications

The fighting force of tomorrow will be distributed across an information network. Each Soldier will be a node of that network as part of a unit of action, and the efficient transfer of information across the network will be critical. The Advanced Training Methods Research Unit conducted research using distributed learning (DL) technologies to provide the Army with a clearer picture of what factors make information exchange more natural for distributed forces.

Use of text messaging improves training and allows more realistic collaboration

Virtual Tactical Operations Center (VTOC)

The Army is in the process of converting over 500 courses to a DL format. As part of the Army's training transformation initiative, the U.S. Army Armor School (USAARMS) redesigned the Armor Officers' Advanced Course for Reserve Component officers. The impetus for this research was to assess the conversion of a traditional classroom course to a DL format. The new course design included one section where students collaborated using a virtual tactical operations center (VTOC).

There were six training sessions using the VTOC, each taking place over 12 hours during one weekend per month. The students using the VTOC were distributed across the country, most taking this portion of the course from their homes. The VTOC system included tools such as electronic versions of field manuals, 3-D terrain imaging, a map-edit program, and a shared whiteboard (see Figure 1). The students could communicate with one another using Voice over Internet Protocols and text messaging. Since many of the students were using home dial-up connections, problems often occurred with the voice communication system. Text messaging proved to be a more stable mode of communication given the capabilities of their home machines. The research by ARI focused on the use of text messaging as a means to collaborate.

Research Results

Previous research on the effectiveness of text messaging focused on comparing text messaging with voice communication. While text messages tend to be better thought out than voice communication, voice allows for a greater amount of information exchange over a period of time. For network-based communication, text messaging uses far less bandwidth than voice communication. Our research on text messaging suggests that it supports the varied communication needs during VTOC exercises.

To assess the qualitative nature of text messaging, we categorized their content. Three types of text communication were identified: task-related, social, and technology-related. Task-related messages involved statements oriented toward

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Figure 1. The VTOC Screen Interface

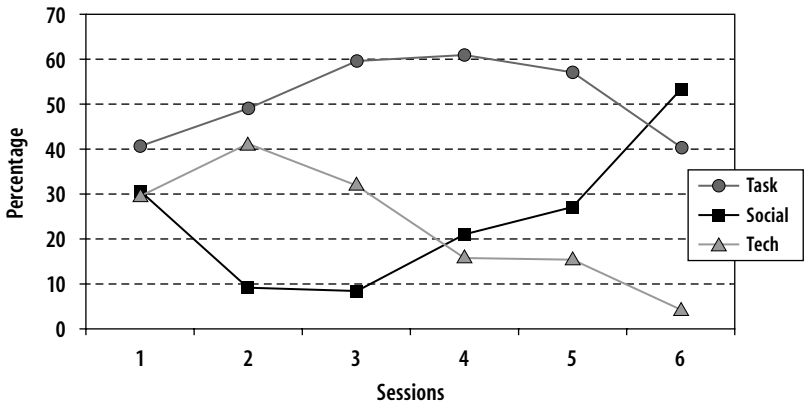
Text Messaging for Effective Communications

the VTOC exercise (i.e., tactical content, military resources, and aspects of the battle plan). Social interactions were messages not related to the task, but involved personal content (i.e., asking people their name, where they are from, personal interests, and hobbies). Technology-related interactions involved the equipment used for the exercise (i.e., how to use a specific VTOC tool or problems with the technology).

A total of 6,806 text messages were recorded across all six sessions. Only 101 messages lacked sufficient information for coding, and were not analyzed. Of the remaining 6,705 messages, 54 percent were rated as task, 30 percent were rated as social, and 16 percent were rated as technology-related. This indicates that during training using the VTOC, the majority of communication was relevant to course objectives, but other topics also were discussed.

The relative frequency of the different types of text messaging changed across sessions (see Figure 2). During the initial session, moderate levels of on-task, social, and technology-related communication occurred. Over the next few sessions, the level of social communication dropped, but rebounded during the final session. The frequency of technology-related communication dropped after the first two sessions and remained low. The relative frequency of on-task communication peaked during the middle sessions, but continued to be the most frequent type of communication across sessions.

Figure 2. The percentage of task, social, and technology-related text messages across training sessions.



Most students felt that the use of VTOC with text messaging was an effective means of communication during this portion of the course. Follow up interviews were conducted with several students after they had completed the VTOC portion of the course. During these interviews students said that the VTOC environment allowed the teams to develop into cohesive groups before they met face-to-face.

Implications for DL

The change in relative frequencies of different forms of text communication provides insight into the development of a virtual team. During initial group formation, there are frequent social communications so that the members can get to know one another. Also, during the early sessions problems with the technology are more likely to arise and text messaging can be used to solve these difficulties. As the group proceeds, frequency of problems recede and more time is given to the training objectives. Familiarization with these communication patterns may help DL instructors to plan courses that allow for team development, social interactions, and problem solving.

As the Army transforms many of its courses to a DL format, some people have expressed concerns about what students may have to sacrifice with regards to student-to-student interaction. In general, while the research behind DL strongly suggests that it is at least as effective as traditional classroom based instruction, there are peripheral factors where research on DL has still not yet demonstrated equality.

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Text Messaging for Effective Communications

One such aspect is the social components of training. There is concern that because students in a DL environment may not meet face-to-face, the quality of their social interactions may suffer. Specifically in the Army, when individuals take part in training, they develop social and professional contacts with other Soldiers. These contacts lead to collaboration beyond the course and play an important role in the Army. ARI's research on the use of text messaging in a DL environment suggests that those concerned should feel more at ease. In fact, students are able to form personal and professional relationships in a collaborative DL environment.

Implications for Network-based Warfare

Text messaging is a mode of communication that is used in the Army Battle Command System (ABCS) and will be used in the Future Combat System (FCS). One of the benefits of text messaging versus other forms of communication is that it does not require a high bandwidth. While the "wires" of text messaging have been assessed for different networks, text messaging in a military environment has not been assessed with regards to transfer of meaning and the ability to fulfill task and social needs. While this research shows that text messaging can be an effective means of communicating, we need to exercise caution about assuming that it is equally good for all collective processes, such as information sharing or engendering a sense of trust or urgency.

Summary

The use of VTOC during training is an example of "train as you fight," using a network-based system to learn skills that will be used by a networked force. The VTOC provides training that is similar to what Soldiers should experience in an operational environment.

The VTOC and the use of text messaging show promise to improve training by allowing more natural, realistic collaboration among distributed Soldiers. This realism includes the opportunity for social interactions that would normally occur in face-to-face training. These findings indicate that text messaging can support social communication, which is imperative to the formation of collective processes such as cohesion.

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Training Adaptive Performance in Special Forces

Following the events of 11 September 2001 and the ensuing war, unconventional warfare (UW) and other special operations have emerged as some of the most critical strategic tools in combating terrorism. The Army Special Forces take a lead role in planning and conducting UW operations, so it is now more important than ever that special operations training courses develop and amplify these capabilities.

UW missions involve training and assisting members of a resistance movement in another country. These missions require interacting closely in intercultural settings and operating in ambiguous and changing political climates, often in remote areas. One of the most important attributes for success in UW and other special operations missions is adaptability. This includes being adaptive while planning missions and making decisions, being adaptive when interacting with people, and being physically adaptive and adaptive as a team when operating in the field. This article will describe the development of a 3 1/2-day course in adaptive performance for officers in training for Special Forces.

Training Special Forces

Training for Special Forces (SF) is a long and difficult process. Figure 1, reprinted from the Winter 2002 issue of the Special Warfare magazine, depicts the phases of assessment and training for SF.

During this training process, Soldiers learn critical tactical and technical skills and participate in a large number of practical exercises and field training exercises. These exercises are highly realistic and provide numerous opportunities to practice skills and receive feedback.

A review of the training system suggested that, while adaptive performance skills were required for success in many exercises during training, the concept of adaptive performance and the basic elements of the concept were never formally introduced to the Soldiers. Essentially, the "crawl" piece of the "crawl-walk-run" progression was missing.

The Directorate of Training and Doctrine (DOTD) at the U.S. Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS)

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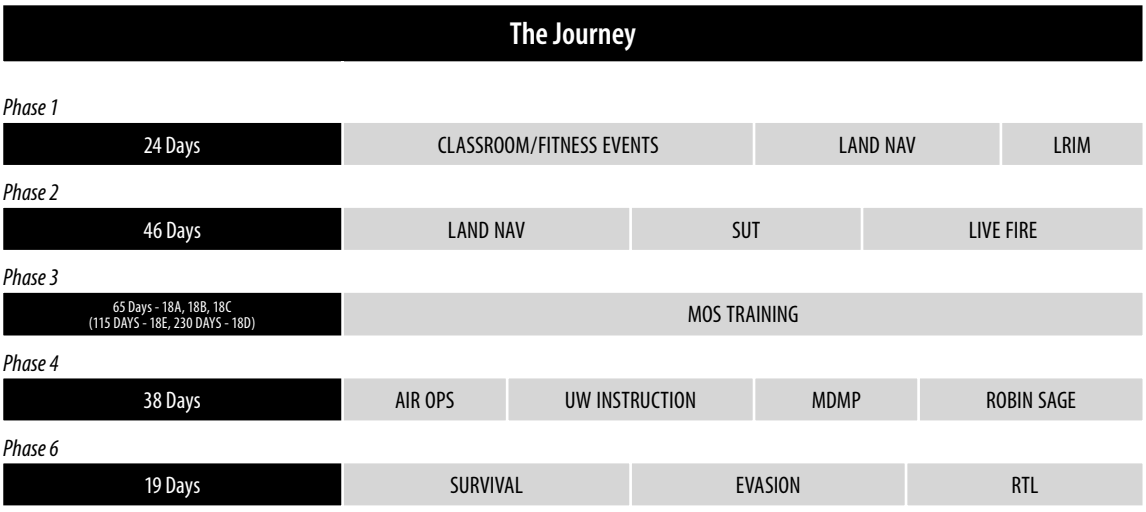
Figure 1. Overview of Training Process for Special Forces



Reprinted from: Clark, J., Skinner, M., Tertychny, G. (2002). The SFQC metamorphosis: Changes in the SF training pipeline. Special Warfare, 15, 2-7.

Training Adaptive Performance in Special Forces

requested help from the U.S. Army Research Institute (ARI) to develop a course that would introduce the concept of adaptive performance and provide the initial groundwork of knowledge for later skill development and practice in the field exercises.

Project Overview

Personnel Decisions Research Institutes (PDRI) began work for ARI and the Special Warfare Center in January of 2002 to design the program of instruction (POI) for this course and develop the course materials and instructor guidelines.

The first steps in designing the POI were to define adaptive performance and identify the dimensions of adaptive performance that are relevant to SF.

> Based on a number of definitions found in the literature review, the project team defined adaptive performance as "the effective change of behavior in response to an altered situation".

There are three key features that should be noted in this definition. The first is that adaptive performance refers to performance in which there is a change of behavior, that is, an individual changes the actions he or she is taking in a situation. The second key feature is that this change of actions is in response to a change in the situation or environment in which the individual is acting. The third key feature is that the change in behavior is effective, and therefore enables the individual to perform successfully in the new environment.

Next, based on an adaptive performance taxonomy developed previously by personnel at PDRI, as well as the performance requirements identified for the Special Forces job and interviews with SF subject matter experts (SMEs), the project team chose to focus on two specific adaptive performance dimensions: mental and interpersonal adaptability. In addition, because teamwork is inherently critical to Special Forces performance, the course also covers the concept of leading an adaptive team.

Designing Materials

A review of the existing research and training practices in mental and interpersonal adaptability revealed few already developed exercises that could be applied to this course. The original plan was to find already existing materials, adapt these for the course and then develop new materials as necessary for areas that were not covered by existing materials. Because so few training exercises existed, however, and because the context of performance is so important in the development of adaptive performance skills, every exercise had to be developed new or modified significantly in order to be appropriate.

Two lines of research originating from ARI were applied to the project. First, ARI research produced an adaptive thinking program called Think Like a Commander, which has been used at command preparation schools to train commanders at the brigade, battalion, and company levels. The process and approach of these materials were instructive for the development of the course.

In addition, research conducted for ARI by Dr. Zaccaro at George Mason University provided a useful conceptual base for structuring the POI and determining which attributes were likely to be the most susceptible to training. As part of his work, Dr. Zaccaro developed adaptive performance coursework for senior level leaders at the U.S. Army War College. The research team was able to modify some of these concepts to be used as part of the Special Forces course.

POI Overview

The course designed for Special Forces is called the Adaptive Thinking and Leadership course (ATL), and it begins with an exercise that demonstrates the importance of adaptive performance to Special Forces. Students are then introduced

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Training Adaptive Performance in Special Forces

to the concept of adaptive performance and the performance requirements in Special Forces through lecture and discussion. The first day also includes a workshop on personal assessment information, a topic that will be discussed further in the following section of this article. The second day covers topics related to mental adaptability, including critical thinking, how to switch mindsets to solve problems, and adaptive decision-making. The third day contains materials relevant to interpersonal performance, which includes self-awareness and systems awareness, and negotiations. The final half-day of the course addresses the issue of leading an adaptable team and provides information and practice on delivering effective feedback to their team.

Individual Assessment & Development

Just as with skills such as land navigation or marksmanship, it is important to help an individual develop an understanding of their strengths and weaknesses in the area of adaptability. This enables them to focus on improving their weaknesses or at least learn how to compensate for them in appropriate ways.

One of the key elements of the POI, therefore, is the focus on individual development. One-on-one individual development meetings with qualified psychologists are held for each student to discuss scores on various personal assessment tests and how they apply to performance in the area of adaptability. In addition, there is a class the first day that provides a presentation and discussion of how to utilize the personal assessment information.

One of the psychological tests that could be used for this in the future is the Test of Adaptable Personality (TAP), developed by Dr. Kilcullen at ARI. Dr. Kilcullen found empirical evidence that demonstrates that dimensions on the TAP predict the successful performance for Special Forces

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Training Adaptive Performance in Special Forces

Soldiers during training and out on operational teams. His goal is to develop an automatic feedback process for the test that will enable results to be processed quickly and provided to students in an individualized feedback packet tailored to their strengths and weaknesses.

Products & Status

At the conclusion of this project, Special Forces will have all of the products they need to conduct the 3 1/2-day ATL Course. This includes the following:

- The adaptive performance POI
- An instructor manual for the course
- Training slides for lectures and exercises
- Exercise materials and instructions
- A plan for program evaluation
- A final report that discusses the integration of this course with other training

A first draft of these products for an earlier 5-day version of the course was completed in December of 2002, and a success pilot test was conducted for about 15 students in April of 2003. Student reaction to the course was highly positive. Both the students and administrators conveyed the opinion that the course would be useful in preparing them for later training exercises. During the pilot a number of structural modifications were identified that would improve the course, and these are currently being incorporated. The modified course will be conducted in December of 2003.

From an evaluation perspective the most critical question is whether the course produces actual improvements in Soldier performance - either in the later phases of the course or out in the operational units. Although we cannot conduct an experiment using a control group to determine this, we do plan to compare Soldier performance in later training exercises before and after implementation of the introductory course to compare levels of success.

Future Directions

As the final changes are being made to the officer ATL course, a new effort has begun that will adapt the ATL course for use in the SF Warrant Officer Basic Course and SF Advanced Noncommissioned Officer Course. With increasing uncertainty in the threats encountered in the war against terrorism, adaptive performance skills become more important not only for officers or SF Soldiers, but for all military personnel engaged in these global missions. While the actual course materials developed for training Special Forces are not directly transferable to other Army personnel, the methodologies used in the course can easily be applied to other Army units.

For additional information, please contact Dr. Michelle Wisecarver, ARI—Selection and Assignment Research Unit, ARI_ SARU@ari.army.mil.

Army Continuing Education System (ACES) For Soldier Retention and Performance

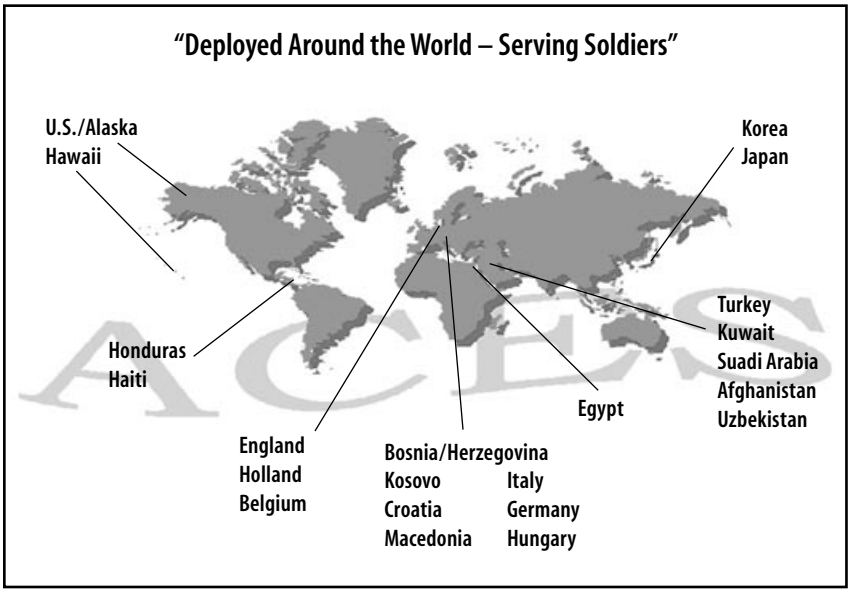
Lifelong Learning

Importance

A recently completed ARI study provides compelling evidence that participation in in-service education programs supported by the Army Continuing Education System (ACES) results in positive outcomes for both individual Soldiers and the Army. These outcomes include reduced first-term attrition, increased reenlistment, and enhanced job performance. The study findings showed a consistent pattern of positive effects across programs and outcome measures for both first-term Soldiers and Non-Commissioned Officers. The study's sponsor is now using these findings in supporting the Army's future training objectives.

Importance of ACES Evaluation

The Army Continuing Education System (ACES) provides a wide range of in-service educational opportunities for enhancing the Army's human resource potential while benefiting the careers of Soldiers both during and after their military service. As shown on the map below, these services are made available to Soldiers on a world-wide basis. While there is widespread belief that participation in ACES programs results in positive outcomes for both Soldiers and the Army, there has been little rigorous research addressing this question.



In recent years, there has been a growing need for the U.S. Army Human Resources Command (HRC) to acquire data that quantify the value of the ACES in-service educational programs with respect to Army objectives. As lifelong learning has grown in importance to the Army, there has been an escalation in demand for ACES programs by Soldiers. In addition, the costs associated with continuing education are also growing and in competition with the increasing funding needs of other critical Army requirements. In short, there is a need to better quantify and document the benefits of ACES programs so that an evaluation of appropriate funding for these programs can be made.

Evaluation Effort

In response to this need, the U.S. Army Research Institute (ARI) initiated a study to investigate the relationship between participation in selected ACES programs and Soldier retention and performance. As part of ARI's Studies and Analysis program, this three-year effort was jointly funded by HRC and ARI -- and involved the active collaboration of ARI, HRC's Education Division, and the Human Resources Research Organization (HumRRO) under contract with the Army.

Continued on next page

Army Continuing Education System (ACES) For Soldier Retention and Performance

The biggest challenge of this effort was design of a cost-effective approach for providing objective data bearing on the effects of ACES programs for Army outcomes. Part of this challenge stemmed from the variety of ACES programs and the variation in the types of Soldiers who use the different programs. Another aspect of this challenge was the significant time interval between program participation and the emergence of desired Army outcomes. That is, Soldiers take part in an ACES program at some time in their career, and the outcomes of interest appear at some, often substantially later time. Tracking Soldiers over time was beyond the scope of the effort.

Our evaluation approach tested the effects of programs with relatively large participation rates. These programs included Tuition Assistance, Functional Academic Skills Training, MOS Improvement Courses, and NCO Leader Development Courses. A brief description of these programs is provided in the text box on the right.

The evaluation approach also involved the development and analysis of two combinations of available records. The use of multiple information sources allowed the evaluation of a wider range of programs and outcomes than would have been possible with a single source. For the evaluation of Soldier participation in Tuition Assistance and Functional Academic Skills Training (FAST), automated administrative records of Soldier's participation in ACES programs were combined with measures of attrition and retention from personnel files. In addition, a database incorporating NCO survey responses, administrative data, and supervisor ratings of performance was created to assess the effects of participation in Tuition Assistance, NCO Leadership Training, and MOS Improvement Courses on job performance and promotion.

Findings

Many different Soldier characteristics (e.g., gender, aptitude, and education) can influence a Soldier's retention and job performance. In this study, the data analyses sought to take such factors into consideration so the effects of participation in ACES programs could be assessed independently of the other factors. Without doing so, one might overestimate the effects of ACES participation on these outcomes.

Considering the many factors that influence a Soldier's retention and performance, it would indeed be impressive to find that a given in-service educational program had a significant independent impact on these important long-term outcomes. Importantly, this study found such effects across multiple ACES programs -- and across multiple outcome measures and samples.

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Description of Evaluation Programs

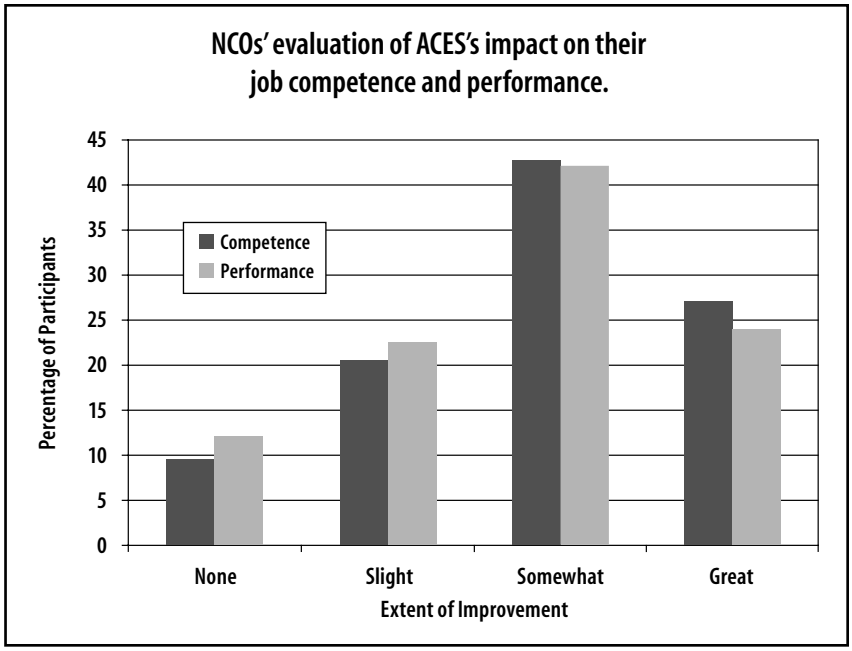
Tuition Assistance. The Tuition Assistance (TA) program provides financial assistance for voluntary off-duty education programs in support of a Soldier's professional and personal self-development goals. TA is available for courses that are offered in the classroom, online, by correspondence, or through other non-traditional means. The goals of this program include retaining quality Soldiers, enhancing their career progression, increasing the combat readiness of the Army, and returning Soldiers to civilian careers.

Functional Academic Skills Training (FAST). The FAST program is a standardized job-related curriculum providing Soldiers on-duty instruction in a set of skill qualifications and prerequisite academic competencies. This on-duty instruction enhances reading, math, language, and computer skills. The goal is to improve job performance, prepare Soldiers for more advanced schooling, increase reenlistment options, and enhance trainability.

MOS Improvement Courses. MOS Improvement Courses offer on-duty instruction that supports unit readiness by providing individual training oriented toward specific mission, organization, or equipment requirements. These courses augment normal on-the-job training programs and assist unit commanders in fulfilling training requirements.

NCO Leader Development Courses. NCO Leader Development is an on-duty program designed to assist NCOs with high leadership potential to better perform their roles as supervisors, managers, trainers, and communicators. This program offers practical, "hands on" experience in dealing with a variety of topics and situations and is designed to improve duty performance and enhance career growth.

Army Continuing Education System (ACES) For Soldier Retention and Performance



Highlights of the significant findings are summarized below.

Attrition and Reenlistment Findings

- Participation in ACES Tuition Assistance was associated with a 7-percentage point increase in the probability that a Soldier would reenlist for a second term.
- Participation in ACES Tuition Assistance was also associated with a 5-percentage point increase in the probability that a Soldier would complete his or her first two years of service. This is an impressive finding because most first-term attrition occurs before Soldiers would have had an opportunity to participate in this program.
- Participation in Functional Academic Skills Training (FAST) was associated with a 1-percentage point increase in the likelihood of reenlistment and a 6-percentage point increase in the probability of completing the first two years of service.

Job Performance and Promotion Findings

- Participation in 15 semester hours of ACES Tuition Assistance was associated with (1) higher scores on a modified Promotion Point Worksheet, (2) higher job performance ratings, and, (3) faster promotion time (by as much as 49 days) for Soldiers within some pay grades.
- Participation in one MOS Improvement Course was associated with (1) higher scores on a modified Promotion Point Worksheet, and (2) faster promotion time (by as much as 27 days) for Soldiers within some pay grades.
- Participation in one NCO Leadership Development Course was associated with higher scores on a modified Promotion Point Worksheet within some pay grades.

NCOs' Personal Assessments

- NCOs' self-reported evaluations of ACES programs were very positive. Approximately 90% of those surveyed indicated that participation in ACES programs had improved their competence and performance as a Soldier, as indicated in the chart. Importantly, these evaluations were even more positive among Soldiers in higher ranks, who generally had more experience with ACES programs.

Use of Findings

Findings from this study are being used to document the importance of ACES programs for enhancing unit readiness and building a culture of "lifelong learning" in the Army. This information is now helping to provide a business case justification for continuing to fund ACES programs at adequate levels. Additionally, the evaluation approach and lessons learned from this effort will benefit the Army by facilitating future evaluations of ACES programs.

For additional information, please contact Dr. Mark Young, or Dr. Trueman Tremble, ARI—Selection and Assignment Research Unit, ARI_SARU@ari.army.mil.

Assembling Qualitative Data in "Real Time"

Provides important techniques for in-depth research efforts with complex data sets

When the U. S. Army leadership initiated an examination of Army training and leader development in 2000, a policy decision was made that there would be significant over sampling of the population. Where normal survey practice might dictate a sample size of 1000-1500 respondents, the project director determined that five to ten times as much data would be collected. This decision was based on the desire to encourage collecting broad points of view and on the expectation that the credibility of results to the layperson would be greater with a larger sample. The resulting series of projects, which came to be known as the Army Training and Leader Development Panel (ATLDP) study, ultimately generated data from over 13,000 focus group and in-depth personal interview participants, and comments from over 80,000 surveys collected from Army personnel around the world. The Army Research Institute (ARI) provided key scientific advice and data analysis support from the early stages of the ATLDP project; we quickly found ourselves faced with the challenge of trying to efficiently and accurately analyze this huge body of qualitative data. Previous approaches to quantify and analyze the information collected from focus groups, interviews, and surveys proved cumbersome and inflexible – there had to be a better way of collecting, sorting and analyzing the large amounts of valuable information.

ARI, along with its contractor, Caliber Associates, Inc., found just such a solution with the creation of two software packages called Qualitative Data Input Application (QDIA) and Q-Code. To date, this technique for coding and analyzing the qualitative data collected from focus groups, interviews and surveys has been applied to two studies looking at the leadership training and development of Army warrant officers and civilians as well as three other research projects. Thus far, the benefits from using this coding technique have been substantial, including increased accuracy and timesavings that have resulted in decreased costs. The software resulted in 75 percent timesavings in processing over a commercially available program for qualitative analysis. Accuracy increases came from greater precision and consistency in data entry and a method to record signs of agreement in a session.

Creating Qualitative Data Input Application (QDIA) and Q-Code

In 2000, ARI began working with the Caliber team to support the series of ATLDP studies, which in four distinct phases addressed training, leader development and Army culture issues for officers, NCOs, warrant officers, and civilians. Large amounts of qualitative data were collected from focus groups, in-depth interviews, and open-ended survey comments. During the officer and NCO phases, analysts used an off-the-shelf application for analyzing these data, allowing them to categorize each comment based upon its thematic content.

As researchers proceeded with this off-the-shelf application, they discovered several major difficulties. First, it did not allow more than one analyst to code data simultaneously. Workarounds were created, causing a new set of problems. Second, the software was developed primarily for small-scale focus group applications and was not flexible enough to handle such a large volume of comments. It required several hours to produce a simple frequency report of themes. Finally, extensive and time-consuming manipulation and "cleaning" of the data were required before the information could be imported into the software program for analysis.

To address these difficulties Caliber Associates senior systems designer, John Kessler, developed a custom application that addressed these concerns. This application came to be known as Qualitative Data Input Application (QDIA) and Q-Code. Simply described QDIA is a data entry program that can be used by minimally trained data collectors while Q-Code is a program for coding, analysis and report generation.

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Assembling Qualitative Data in "Real Time"

Using QDIA and Q-Code for focus groups and interview research involves the following steps:

- Collecting demographics and comments of participants
- Entering data into QDIA
- Importing data into Q-Code
- Developing and entering themes (categories of responses) into Q-Code
- Classifying data into themes
- Analyzing thematic responses by demographic characteristics and
- Generating analytic reports

How QDIA and Q-Code Work

The benefits to this data sorting and analysis technique are probably best understood through an example.

In the ATLDP Civilian Phase, data were gathered on training and leader development issues through 500 focus groups, 250 interviews, and 37,000 surveys. There were open-ended questions that allowed respondents to freely comment on the Army's training and leader development programs. There were 38 questions used in focus groups and interviews and one open-ended question included in the surveys.

As 50 data collectors in five countries conducted the focus group and interviews, each participant's demographics and responses to each question were entered into QDIA (see Figure 1). QDIA is equipped to accommodate multiple classes of demographic information, so when the data collectors entered the information, they used simple check boxes and drop-down menus to record the information, greatly reducing the chance of error.

During a session, a note-taker used a standard procedure to write down what the focus group said. As early as possible after the session, the note-taker and facilitator checked and clarified the notes and entered them into QDIA using a laptop computer. At the end of each day, the data collectors encrypted the QDIA data files from that day's focus groups and in-depth interviews, and sent them back to the ATLDP Analysis Cell, located at Ft. Leavenworth. The Analysis Cell placed the data into a central database, and then used Q-Code to analyze responses for each question. Based on early data returns, categories or "themes" were developed by the analysts. These themes were entered into Q-Code, and teams of analysts then began reading each of the 49,000 comments and assigning them categorical codes based upon their thematic content. Themes were modified readily as additional response categories were identified, thus improving the analysis. Q-Code allowed coders to work simultaneously which greatly decreased the time required to prepare and analyze the data.

For example, one question asked what should be done to retain qualified personnel. Initial themes, which were identified included: promotions, increase pay, benefits, job security, and supervisor quality. It soon became apparent that there were important additional themes, for example, types of training and development opportunities.

Reports on the frequency of themes, along with narrative descriptions of the comments and survey item data provided study team analysts with a rich set of both quantitative and qualitative information from which to develop findings, draw conclusions, and make recommendations for improving training and leader development. Additional reports were also generated on key thematic content in order to answer questions that were posed by the study teams during the analysis process.

To learn more about the results of this initiative see the ATLDP web site: http://www.army.mil/features/ATLDPCiv.

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Assembling Qualitative Data in "Real Time"

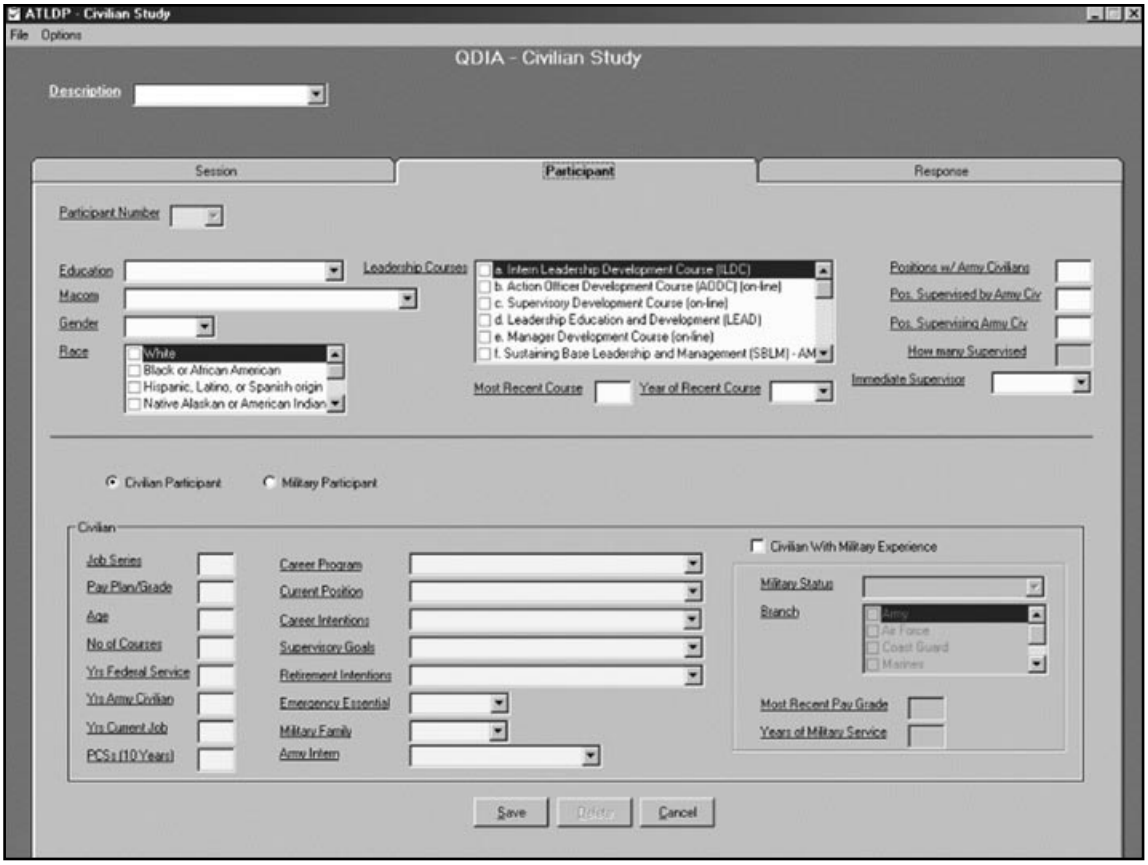

Figure 1. Data entry screen for participant information, with tabs to reach data entry for session and response information.

What QDIA and Q-Code Can Mean for Your Survey Process and Results

As the example above illustrates, this new coding process allows for a degree of coding flexibility, accuracy and time efficiency that has the potential to dramatically improve the value of qualitative data. Often, data from focus groups and interviews are analyzed by simple renderings of transcripts or selected "quotes" exemplifying the nature of the comments. By using QDIA and Q-Code, much more detail and analytic richness can be gained, and results can be reported for different segments of interest to the investigation. So, for the example cited above, the results often differed among managers, employees, and Soldiers.

QDIA and Q-Code are proving to be highly useful and important techniques in the researchers' toolkit for exploring qualitative data from focus groups, in-depth interviews, or survey research efforts that involve large and complex data sets. Survey researchers and program evaluators who in the past were reluctant to ask research participants to respond in their own words, now can process and analyze such results efficiently and in a timely manner. These tools enhance analysts' ability to understand their data and to provide added texture to their analyses and interpretations. QDIA and Q-Code represent a welcome advancement in the research tools and methods available.

For additional information, please contact Dr. Jon Fallesen, ARI—Leader Development Research Unit, ARI_LDRU@ari.army.mil.

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