This PDF document was made available from www.rand.org as a public service of the RAND Corporation.

Jump down to document

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world.

Support RAND

Purchase this document
Browse Books & Publications
Make a charitable contribution

For More Information

Visit RAND at www.rand.org
Explore RAND Arroyo Center
View document details

Limited Electronic Distribution Rights
This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents.
This product is part of the RAND Corporation monograph series. RAND monographs present major research findings that address the challenges facing the public and private sectors. All RAND monographs undergo rigorous peer review to ensure high standards for research quality and objectivity.
Transformation and The Army School System

Michael G. Shanley, James C. Crowley, Matthew W. Lewis, Ralph Masi, Susan G. Straus, Kristin J. Leuschner, Steven Hartman, Sue Stockly

Prepared for the United States Army
Approved for public release; distribution unlimited
The research described in this report was sponsored by the United States Army under Contract No. DASW01-01-C-003

Library of Congress Cataloging-in-Publication Data
Transformation and the Army school system / Michael Shanley ... [et al.].
p. cm.
“MG-328.”
Includes bibliographical references.
ISBN 0-8330-3809-5 (pbk.)

U408.T73 2005
355.5’0973—dc22
2005011814

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND’s publications do not necessarily reflect the opinions of its research clients and sponsors.

RAND® is a registered trademark.

© Copyright 2005 RAND Corporation
All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from RAND.

Published 2005 by the RAND Corporation
1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
201 North Craig Street, Suite 202, Pittsburgh, PA 15213-1516
RAND URL: http://www.rand.org/
To order RAND documents or to obtain additional information, contact
Distribution Services: Telephone: (310) 451-7002;
Fax: (310) 451-6915; Email: order@rand.org
The Army School System (TASS) Must Respond to the Demands of Army Transformation

The Army is currently conducting an extensive set of diverse and demanding operations, and it is likely that such operational challenges will continue. As part of its response to these challenges, the Army is undertaking a process it calls Transformation, which involves reforming its organizations and operational concepts to improve responsiveness and lethality. Army Transformation will involve, among other things, increased use of joint and combined arms capabilities and the leveraging of networked information systems and other technologies. Changes are also underway in roles and missions for both the Active Component (AC) and the Reserve Component (RC), including modernization and conversions to modular Brigade Combat Team (BCT) organizations. All told, these ongoing and future changes will place increasing demands on Army training.

The Army School System (TASS) will play an important role in meeting the Army’s expanded training mission. TASS is responsible for the vast majority of institutional training within the Army; it provides training to soldiers in both the AC and the RC, which includes the Army National Guard (ARNG) and the U.S. Army Reserve (USAR). Each year, TASS provides a total of approximately 75,000 student-years of training to Army personnel at a cost of some $6 billion. TASS is a composite school system comprising the AC, ARNG, and USAR educational training institutions. However, the responsi-
The RAND Arroyo Center was asked to assist TASS in developing policies and options to respond to the needs of Army Transformation and to increase TASS’s contribution to Army readiness. This research also sought to identify ways to improve the integration of the AC and RC training systems within the context of Army Transformation and the corresponding changes required within TASS.

Preparing for the Future Training Environment Requires Solutions to Multiple Challenges

The challenges facing the Army place specific demands on the training system and have implications for TASS’s role, as indicated in Figure S.1. The challenges of current and future operating environments mean that Army training will need to cover increasingly complex skills for leaders and a wider range of conditions and technical skills, as well as more specialized types of training. In addition, training must be rapidly adaptable to meet the needs of changing missions and operations and must support the achievement and maintenance of high readiness in all AC and RC units.

One result of these increased demands is that TASS will need to achieve more in the following areas in order to support the Army’s future training needs:

- **Development.** TASS will need to develop more courses, training support packages (TSPs), and other training products for both the AC and the RC and must be capable of developing and adapting training rapidly.
- **Delivery.** TASS will need the capacity to deliver more types of courses to satisfy the individual training needs of both AC and RC forces and may also need an improved surge capacity to achieve adaptability.
The need for more courses means that TASS, in conjunction with the personnel community and units, will have to manage more information to ensure that the right training is delivered at the right time to the individuals who need it.

In addition to achieving more in these areas, TASS must maintain quality standards while facing constraints of student time and available training manpower.

**Enablers Can Help TASS Achieve Its Future Training Mission**

Our research identified three enablers that will be particularly useful in helping TASS fulfill its role; however, each of the enablers brings its own challenges.
• **Just-in-time/assignment-oriented training (JIT/AOT).** JIT/AOT is training in specialized skills that occurs just before the skills are applied. JIT/AOT provides focused “pieces” of training in the areas that are relevant to the soldier’s next assignment. While JIT/AOT will likely require less time and will reduce the total volume of training that would otherwise be required, it could potentially create a significant forcewide management burden due to the need to coordinate appropriate training with personnel assignments. It could also reduce the flexibility that more wide-ranging but less-focused training affords the personnel assignment process.

• **Training technology.** New training technologies can potentially assist TASS training developers in conducting needs analyses, designing training content, and developing training products. Technology can also be used for course management: For example, the Army’s investment in a learning-management system (LMS) will enable tracking of training required and completed by individual soldiers. Technology can provide the means to store and deliver training content (i.e., provide the “pipes”) and to implement training with a high degree of flexibility (i.e., allowing learners to interact with instructors, other learners, or media). However, the use of technologies to implement training can add to the training-development burden, a burden that would appear inconsistent with the resource constraints facing TASS. Moreover, technology will not be an appropriate delivery vehicle for all kinds of training.

• **A more decentralized capability for TASS.** Decentralized training is individual training that takes place away from a centralized schoolhouse. Such training could be provided by units, distributed learning (DL) supported by technology, or local schools located away from the central schoolhouse (but staffed by TASS personnel and linked to proponent schools). Increased use of decentralized options will allow TASS to expand the number of locations and times at which training can take place, facilitate JIT/AOT, and be more responsive to unit needs in an increasingly diverse force. However, these options must be used selec-
tively if they are to be effective, for several reasons. For example, the training-development burden will increase if more training is conducted by units or through DL. Moreover, technology-supported DL appears suited for only some types of training, and local instruction, if improperly used, could lead to a loss of scale economies. Finally, maintaining training quality and effective resourcing could prove difficult across dispersed training sites.

Our Research Identified Three Key Areas for Change

Our examination of the challenges facing TASS and the potential enablers for meeting those challenges revealed three key areas in which change is required.

**TASS Should Build a More Responsive Training-Development Capacity for Interactive Multimedia Instruction (IMI)**

To meet future training needs, TASS will require a responsive training-development capacity. We focused on one important part of this requirement: how TASS might improve the training-development process associated with IMI. Increased use of training technology is likely to significantly increase TASS’s development burden. Therefore, TASS could benefit from lessons learned by software-development organizations in the private sector. An understanding of these lessons will be useful whether TASS develops training materials in-house or outsources training-development tasks to external contractors. We therefore recommend that the actions outlined below be undertaken.

**Embrace best practices of software-development and software-publishing organizations to meet fast-changing customer needs.**

The commercial sector has established several important requirements for the software-development life cycle, including rigorous quality assurance (QA), high-quality hosting and 24-hour access for Internet training tools, effective customer support, and continuous software maintenance and updates. TASS’s training-development process
could similarly benefit from a focus on the needs of its customers, both individual soldiers and units.

**Adopt an organizational model that ensures quality.** Software companies have developed a model of organizations, technologies, and practices to ensure the efficient development, delivery, and management of their software products (see Figure S.2). This model is designed to support rapid revision and adaptation to customer needs. It includes an expanded software-development team, web programmers, subject-matter experts, and database programmers. A separate activity provides QA, while a software product-support team answers users’ questions about the software. Three distinct databases and database-access tools—bug-tracking systems, a software-support knowledge base, and usage-tracking databases and analyses—improve the quality of the initial software development and help manage customer support thereafter.

**Figure S.2**  
A Model of Proven Organizations, Technologies, and Practices
Adopt new methods and team structures to increase speed and efficiency. TASS will also need to improve the speed and efficiency of the training-development cycle. One method used by the private sector for such purposes is Extreme Programming (XP). XP emphasizes the use of rapid, small cycles of “design, implement, test” throughout the development effort and the development of reusable components of code. XP efforts depend on the use of project-based, multiskilled teams, which are often aggressively managed. The flexibility offered by XP could be incorporated in the TASS training-development process, particularly if training-development tasks are outsourced.

Adopt new technologies to increase speed and efficiency. New supporting technologies promise further improvement in the speed and efficiency of IMI development. The available technologies include instructional-design tools, cost-estimation tools, web-development tools, content-management systems, QA tools, and assessment systems. The eventual convergence of many of these technologies will dramatically increase their overall utility.

TASS Would Benefit from a More Effective Local Training System
Decentralized training—including training conducted by units, by technology-enabled DL, and by TASS manpower in local schools—provides an important set of options for increasing the amount and flexibility of training the Army delivers. Current U.S. Army Training and Doctrine Command (TRADOC) plans focus primarily on the DL option; however, we believe that the local school option also has a critical, as yet undeveloped, role to play in expanding the amount of individual training provided by TASS, as well as that conducted by units. In addition, local schools could play a wide range of other roles in support of the larger training system. By increasing direct contact with units, TASS could become more customer-centric. By making local schools multifunctional, TASS could help ensure their cost-effectiveness.

Local TASS manpower can fill in what technology-supported DL and proponent schools cannot provide. While technologies will continue to advance, it is unlikely that artificial intelligence (AI) capabilities will progress in the 2010–2020 time frame to the point at which
they can be cost-effectively incorporated into a large number of standalone, or near standalone, training modules. The use of IMI training technologies will be further constrained by limited resources to support the costs of development and will not be economically justified for some courses (e.g., specialized courses with small student loads).

Expert trainers and training support personnel will thus retain an important role in conducting individual training, especially for tasks involving complex cognitive skills, which require demonstration of skills and appropriate feedback. Combining a face-to-face local training capability with self-paced learning technologies and collaborative learning environments will better position the Army to coach, mentor, and advise a greater number of soldiers in DL courses and to attend to the needs of those experiencing difficulty with technology.

**Local TASS instruction is the best individual training option in certain situations.** While it is clear that traditionally delivered proponent school and DL training will be key components of the future individual training system, some types of future training can be made more cost-effective through the use of local face-to-face delivery methods within TASS. For example, new digital skills have been found to require frequent sustainment training, which could be offered cost-effectively by local instructors. Local schools would also be a cost-effective option for some short courses, especially those for which travel to a central site is inefficient and the student load in a particular occupation is sufficiently large. Local instruction would also likely be preferable for units with emerging organizational and operational concepts, such as would be expected for the initial set of Future Combat Systems (FCS) Units of Action (UAs), because the content of training for such units is likely to change often.

**Local TASS schools could cost-effectively support expansion of individual training conducted in operational units.** TASS local schools could provide resources to support unit training. For example, local TASS personnel could provide train-the-trainer instruction and research and could adapt proponent-developed training products to specific unit needs. They could also provide direct training support
by conducting classes or other training that is needed by a unit but beyond the unit’s capabilities.

A local TASS capability could assist the Army in accomplishing other training system goals:

- **Collective and leader-training exercises.** Local TASS personnel could help units set up and conduct simulation-supported training exercises, adapt training-support products, develop exercise plans, assess results, and develop remedial training options. TASS instructors could also train and augment observer controllers and support exercise execution and After Action Reviews (AARs).

- **Training development.** Local TASS instructors could serve as links between units and proponent schools by identifying and communicating to proponents the most pressing needs for training-support products and updating units on the latest thinking in both proponent and other schools. Local schools could also share a portion of the development workload.

- **JIT/AOT implementation.** The presence of local instructors would facilitate the process of delivering JIT/AOT to soldiers and leaders after they are assigned to new positions and at the locations of their new assignments.

- **AC/RC integration.** Local AC and RC schools could deliver some required training to AC and RC soldiers simultaneously.

- **“Reachback” support.** Local schools could also be task-organized to provide deployed units with information to help plan and execute ongoing operations (i.e., reachback). Units would benefit from having a local school organization immediately available for specific support rather than having to depend on a “from scratch” effort from the Center for Army Lessons Learned (CALL).

- **Synchronization of unit training cycles.** Local schools could help units improve efficiency by synchronizing individual training with unit training cycles. To the extent that individual training could be conducted locally, unit training programs would expe-
rience fewer disruptions, since there would be less need to send soldiers and leaders to courses at proponent schools.

**Improved Integration of AC and RC Training Institutions Would Increase Available Training Options**

The evolution of training technologies and organizations to satisfy future training requirements suggests greater benefits to training system integration in the future and a wider role for the RC portion of TASS.

A move toward AC/RC institutions would allow the Army to leverage the existing RC school system to inform and support the development of more options for AC training. Since the RC already has an extensive local school system, it makes sense to create one for future Army training that uses those resources and incorporates the lessons learned from the RC operation. For example, RC-sponsored reclassification and transition training for a wide range of occupational specialties could be made available to AC soldiers, providing added flexibility in training choices.

The RC might also be called upon to provide support in meeting specific future training needs. For example, the advent of JIT/AOT training will likely result in the need for more short-duration training events, the type of events that RC school staff could effectively support. RC school subject-matter experts could also effectively support students in technology-based DL courses, by serving either as web-based instructors or facilitators or as on-the-ground trainers.

The RC might also become more involved in QA, training support, and training development, including the conversion of DL courses. For example, RC instructors might serve on training-development teams or might use web-based technologies to contribute to the development or maintenance of DL courses. They could also play a useful role in QA testing. RC instructors could also be made available to provide support to DL-based courses, by either e-mail, Internet chat/Instant Messaging, or phone.

To the extent that the AC joins the RC in providing training at local schools, communication between the components can be im-
proved. In addition, the proximity of AC and RC training staffs would make it easier to coordinate and receive feedback for the cross-component production and maintenance of better training products, such as appropriate RC courseware.

**Spiral Development Can Be Used to Begin the Process of Change**

Because our recommendations call for significant changes and are complicated by many other ongoing Army initiatives, TASS would do well to use a spiral development process to implement change. Under spiral development, an initial version of a product or program is developed as a work in progress. The working prototype is then fielded early, followed by a cycle of evaluation and adjustment in a series of compressed stages (or spirals). This “build a little, test a little” approach is consistent with the DoD Training Transformation Plan and is especially suited to the resource-constrained and rapidly changing environment that TASS faces. Moreover, the spiral development approach provides ongoing opportunities for feedback and revision, a sound argument for resource shifts, and more assurance of ultimate success.

The spiral development process can be supported through implementation research and exploratory pilot studies. We recommend several, focusing on ongoing programs and efforts to minimize costs. For example, one potential pilot could identify opportunities to develop a TASS local school concept by building on existing programs such as the Army’s transition to modular BCTs. Another pilot could examine evolving DL and IMI products to strengthen future products and training-development processes. Another option would be to build and disseminate expertise in rapid training development.

In sum, Army Transformation and wider operational demands will increase the Army’s and TASS’s training requirements and will require a more highly adaptable training system. After a review of the available enablers, we conclude that TASS will need to become more customer-focused, that is, more responsive to unit needs for the
training of individuals and the production of training-support materials. Further, the study findings highlight how TASS could accomplish this objective in two key areas: the development of IMI and the implementation of decentralized training and training development. We also conclude that making the required changes offers the Army an opportunity to further its goal of increasing integration of AC and RC TASS institutions within the larger training system.