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Training

Training and Educational Development in Support of the Institutional Domain

FOR THE COMMANDER:

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History. This is a major revision to U.S. Army Training and Doctrine Command Pamphlet 350-70-14.

Summary. This pamphlet provides guidance and examples for organizations that develop training and education products for primary use within the Army institutional training domain. It contains specific guidance for the development of courses and lessons (based upon tasks or based upon supporting knowledge, skills or attitudes for courses with educational outcomes), with supporting information on analyses, design considerations, implementation, assessment and evaluation, job aids, and graphic training aids, training support packages, and management of training and education products. This guidance incorporates the concepts and paradigms outlined in the U.S. Army Learning Model and supports the development of products that achieve learning outcomes in building overall Army readiness.

Applicability. This pamphlet applies to all Army organizations generating Army learning products used by the Regular Army, U.S. Army National Guard, U.S. Army Reserve, and Department of the Army Civilians.

*This pamphlet supersedes TRADOC Pamphlet 350-70-14, dated 27 March 2015; TRADOC Pamphlet 350-70-4, dated 12 January 2004; TRADOC Pamphlet 350-70-5, dated 20 August 2004, TRADOC Pamphlet 350-70-6, dated 7 September 2004; and TRADOC Pamphlet 350-70-10, dated 29 March 2004.

Proponent and exception authority. The proponent for this pamphlet is the U.S. Combined Arms Center, Army University, Director for Learning Systems. The proponent has the authority to approve exceptions or waivers to this pamphlet that are consistent with controlling law and regulations. Activities may request a waiver to this regulation by providing justification that includes a full analysis of the expected benefits and must include formal review by the activity's senior legal officer. All waiver requests will be endorsed by the commander or senior leader of the requesting activity and forwarded through their higher HQ to the policy proponent.

Suggested improvements. Submit changes for improving this publication on Department of Army Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Directorate of Learning Systems (ATZL-AUL), The Army University, U.S. Army Combined Arms Center, 101 Meade Avenue, Building 102, Leavenworth, KS 66027-1356 or electronically to ArmyU@mail.mil.

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Summary of Changes

Training and Doctrine Command Pamphlet 350-70-14
Training and Education Development in Support of the Institutional Training Domain

This major revision, dated 15 April 2021-

- o Removes 21st Century Soldier Competency language.
- o Supersedes U.S. Army Training and Doctrine Command pamphlets 350-70-4, 350-70-5, 350-70-6, and 350-70-10 to consolidate and incorporate enduring guidance and procedures (throughout).
- o Expands the Analysis, Design, Development, Implementation, and Evaluation Process discussion and the Army University Experiential Learning Model.
- o Synchronizes content on mission analysis and job analysis with U.S. Training and Doctrine Command Pamphlet 350-70-1 (chaps 3 and 4).
- o Explains and provides examples of task selection models (chap 4).
- o Elaborates on how to conduct job analysis surveys and how to conduct target audience analysis surveys (chaps 4 and 5).
- o Adds guidance for design, which addresses module- and course-level terminal learning objectives (chap 6).

- o Clarifies further the use of learning taxonomies in the development of learning objectives (chaps 2 and 7).
- o Includes guidance for developing lessons based on supporting knowledge, skills or attitudes for courses with educational outcomes (chaps 6 and 7).
- o Adds guidance on job aids, graphic training aids, and training circulars (chap 8).
- o Adds a new chapter on implementation (chap 10).
- o Reorganizes assessment and testing content and incorporates enduring content from U.S. Training and Doctrine Command Pamphlet 350-70-5 (chap 11).
- o Reorganizes evaluation, quality and accreditation content (chap 12).
- o Adds synchronization meeting information for critical task and site selection boards, course design reviews, and post-instructional conferences (para 4-11 and app C).
- o Adds course management plan (app H).
- o Updates titles, links and references throughout.

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Chapter 1 Introduction

1-1. Purpose

This pamphlet (Pam) provides detailed guidance for building learning products to support the individual training and education of Soldiers and Department of Army (DA) Civilians. The target audience is the training and education developer (TNGDEV) and others in the Army Learning Enterprise who support the institutional training domain and education programs. This publication is specifically focused to assist all who analyze learning needs and who design, develop, implement, and/or evaluate learning products. See U.S. Army Training and Doctrine Command (TRADOC) Regulation (TR) 350-70.

1-2. References

See [appendix A](#).

1-3. Explanation of abbreviations and terms

See the [glossary](#).

1-4. Scope

This Pam provides guidance for Army training and education proponents to create, revise, and manage learning products for use in the institutional training domain. This Pam provides an overview of Army training and education in relation to the Army Learning Model (ALM) as described in TR 350-70. It describes the procedures necessary to analyze, design, develop, implement, and evaluate training and education that meets Army learning needs. This Pam also provides guidance for quality control (QC) of learning products and processes. This guidance primarily addresses course, module, and lesson revision processes, considerations, and supporting references. Additionally, this publication contains direction for revising or developing individual critical task lists (ICTLs), lesson plans, learning assessments, job aids (JAs), graphic training aids (GTAs), training circulars (TCs), and training support packages (TSPs). Additionally, this guidance addresses quality assurance (QA), and evaluation of institutional learning products, with a focus on formative and summative evaluation. Finally, this Pam briefly discusses resources and essential management processes for institutional learning products.

1-5. Records management requirements

As provided in Army Regulation (AR) 25-400-2, the records management (recordkeeping) requirements for all record numbers, associated forms, and reports are included in the Army's Records Retention Schedule-Army (RRS-A). Detailed information for all related record numbers, forms, and reports associated with AR 25-30 are located in RRS-A at <https://www.arims.army.mil> and referenced in the Training and Education development Toolbox (TED-T) website at <https://cacmdc.army.mil/army/TEDT/Pages/Toolbox.aspx>.

1-6. Army learning policy and systems overview

Army learning policy and systems, detailed in TR 350-70, consolidates policy for Army-wide production, implementation, and evaluation of Army learning products across the operational institutional, and self-development domains. The goal is to support Army readiness with rigorous

training, education, and leader development of Soldiers and DA Civilians that is relevant to units in the operational force.

a. Training is a structured process designed to increase the capability of individuals or units to perform specified tasks or skills in known situations. As defined in AR 350-1, training is the process of providing for and making available to an employee, and placing or enrolling the employee in a planned, prepared, and coordinated program, course, curriculum, subject, system, or routine of instruction or education, in scientific, professional, technical, mechanical, trade, clerical, fiscal, administrative, or other fields which will improve individual and organizational performance and assist in achieving the agency's mission and performance goals.

b. Education is a structured process that imparts knowledge through teaching and learning, predominantly in the institutional and self-development training domains, to enable or enhance an individual's ability to perform in unknown situations. Instruction with increased knowledge, skill, and/or experience is the desired outcome for the learner. This is in contrast to training, where a task or performance basis is used, and specific conditions and standards are used to assess individual and unit proficiency (see AR 350-1). Education also develops an employee's general knowledge, capabilities, and character through exposure to learning theories, concepts, and information. An accredited institution traditionally delivers education, and that education may relate to a current or future mission-related assignment.

c. As viewed through the prism of "psychomotor, cognitive, affective learning," education is largely defined through cognitive learning and fosters breadth of view, diverse perspectives, critical and reflective analysis, abstract reasoning, comfort with ambiguity and uncertainty, and innovative thinking, particularly with respect to complex, ill-structured, or non-linear problems (see TR 350-70).

1-7. Institutional learning processes and products

This Pam describes institutional training domain processes and products. The analysis processes described are used for determining the institutional products needed and/or product design and development requirements. These products include ICTLs, tasks, courses, phases, modules, lessons, lesson plans, learning assessments, supporting products (JAs, GTAs, and TCs), and TSPs. TNGDEVs use the U.S. Army Combined Arms Center (CAC) approved automated development tool, known as training development capability (TDC), for delivering these products to institutions. See TRADOC Pamphlet (TP) 350-70-1 for the method to develop an individual critical task.

a. ICTL. Individual critical tasks are the foundation of Army readiness and are directly linked to mission accomplishment. An ICTL is the list of individual critical tasks that job incumbents must perform to accomplish their missions and duties. Each proponent's critical task and site selection board (CTSSB) selects critical tasks from the total task inventory (TTI) identified during a job analysis to develop the ICTL. The ICTL also includes individual critical tasks linked to one or more collective tasks. The CTSSB supports the operational training domain with current job performance standards and the institutional training domain with current learning product requirements. Conducting CTSSBs every three years or due to an Army learning triggering event such as changes to doctrine, organization, training, materiel, leadership and

education, personnel, facilities, and policy (DOTMLPF-P), supports the maintenance of current learning products. See TR 350-70, TP 350-70-1, and chapter 4 of this publication for job analysis and development of ICTLs.

b. **Course.** A course is a complete series of instructional units (phases, modules, and lessons) identified by common title and number, consisting of curriculum inclusive of critical tasks, educational requirements, or both. A course contains critical learning requirements, such as individual critical tasks and terminal learning objectives (TLOs) derived from analysis of the Army Profession, Army Mission, and specific job or function requirements. A course may also address the elements of critical learning requirements, namely knowledge, skills and attitudes. The results of various analyses determine the overall job and professional requirements needed to design and develop Army learning products. Critical learning requirements qualify a jobholder for a specific Army job or function at a predetermined skill level and/or military education level (MEL). These include initial military training (IMT), professional military education (PME), joint professional military education (JPME), and the civilian education system (CES). These can also include job function, such as an additional skill identifier (ASI), special qualification identifier (SQI), language identifier code (LIC), or skill identifier (SI). A course may consist of phases and modules; however, phases and modules are not mandatory in a course. (See chapter 6 for course design and development information).

c. **Phase.** A phase is a major part of a course taught as a separate instructional unit containing specific learning requirements to accommodate Army needs and/or the availability of certain target audiences, or to address unique resource requirements. Phases divide a course into segments because of time, location, equipment, and/or facility constraints. Additional factors that influence the division of a course into segments are different delivery options such as distributed learning (DL), resident versus nonresident, or any combination thereof. For resourcing purposes, a phase is an instructional unit, identified by a common course title and number, consisting of curriculum inclusive of critical tasks or educational requirements constructed as a portion or segment of a course. Each course phase has a separate program of instruction (POI).

d. **Module.** A module is a group of related lessons and/or learning objectives that promote efficiency in the course structure. In some cases, a module may be comprised of only one lesson based on a single TLO.

e. **Lesson.** A lesson is a segment of instruction that facilitates the accomplishment of learning step activities and enabling learning objectives (ELOs) that lead to a specified learning objective. During a lesson, instructors demonstrate or explain how to perform a particular activity or learn a particular subject. A lesson provides the instructional content for a lesson plan. (See chapter 7 for information on lessons).

f. **Lesson plan.** A lesson plan is the detailed development of information and resources used by instructors/facilitators to execute the instruction prescribed in one lesson within the prescribed time limits using the specified resources. A lesson plan includes the content and supporting information for only one lesson, which supports the learning and assessment of one learning objective. It provides detailed instruction/facilitation notes that orient instructors/facilitators on how to execute particular instructional methods and alternative instructional methods should the

primary/selected instructional method not work. In addition, a lesson plan describes learner behaviors/responses that may occur in the instruction and recommended ways of addressing them, and provides recommendations on how to advance the understanding or performance of specific content based on learner-conveyed understanding. A lesson plan supports one lesson, so proponents can easily share the lesson across the Army to support additional modules, phases, and courses. (See chapter 7 for information on lesson plans.)

g. Learning assessment. A learning assessment is the measurement of an individual learner's performance pre- and post-instruction to verify attainment of the knowledge, skills and attitudes specified in the learning objective(s) and verify attainment of the learning outcome(s) of the lesson and/or course. (See chapter 11 for learning assessments, and chapter 12 for an overview of the QA, QC, and learning products and programs evaluation.)

h. Supporting product. A supporting product can be a JA, GTA, or TC.

(1) A JA is a checklist, procedural guide, decision table, worksheet, algorithm, or other device used as an aid in performing duty position tasks or skills. It gives directions and signals when action is required.

(2) A GTA is a product created to enable trainers to conduct and sustain task-based training in lieu of using extensive printed material or expensive equipment. A GTA may also increase performance during on-the-job training or serve as a JA.

(3) A TC is a paper or electronic publication that provides a means to distribute training information that does not fit standard requirements for other established types of training publications. (See chapter 8 for guidance on these supporting products.)

i. TSP. A TSP is a complete, exportable package integrating instructional products/materials and information necessary to instruct one or more tasks or learning objectives. The contents of the TSP will vary depending on the number of lesson plans included. A TSP consists of a cover sheet, administrative instructions, and complete lesson plans. (See chapter 9 for TSPs.)

1-8. Army learning policy, systems, and Analysis, Design, Development, Implementation, and Evaluation Process

a. The purpose of the Army learning policy and systems is to regulate practices for effective learning management and to specify required enabling systems. It also supports implementation of the ALM through Army-wide standardization of training and education development (TED) practices.

b. The Analysis, Design, Development, Implementation, and Evaluation (ADDIE) Process provides a systematic, cyclic, iterative approach for designing and developing Army courses that meet learning objectives, focus on critical job and/or function requirements, and provide assessment and/or evaluation feedback. The ADDIE process is used to identify all learning methods (to include alternative methods) and to gain efficiencies by providing information to focus resources on critical learning requirements. Figure 1-1 depicts the ADDIE process. The

ADDIE process maintains continuous awareness of the relationships among its five phases, where a change in any phase or output requires review and may prompt adjustments to preceding phases' outputs. Each ADDIE phase is entered as needed for revisions, creating an iterative and cyclic process. TNGDEVs first determine where to enter the process to create a learning product that meets all requirements at the appropriate level while maintaining focus on the learning objectives. Formative evaluations allow for in-progress adjustments maintaining the learning products' alignment with their approved learning objective(s) and learning outcome(s). Key leaders and staff, course managers, TNGDEVs, and instructors/facilitators at all levels must comprehend and apply the ADDIE process.

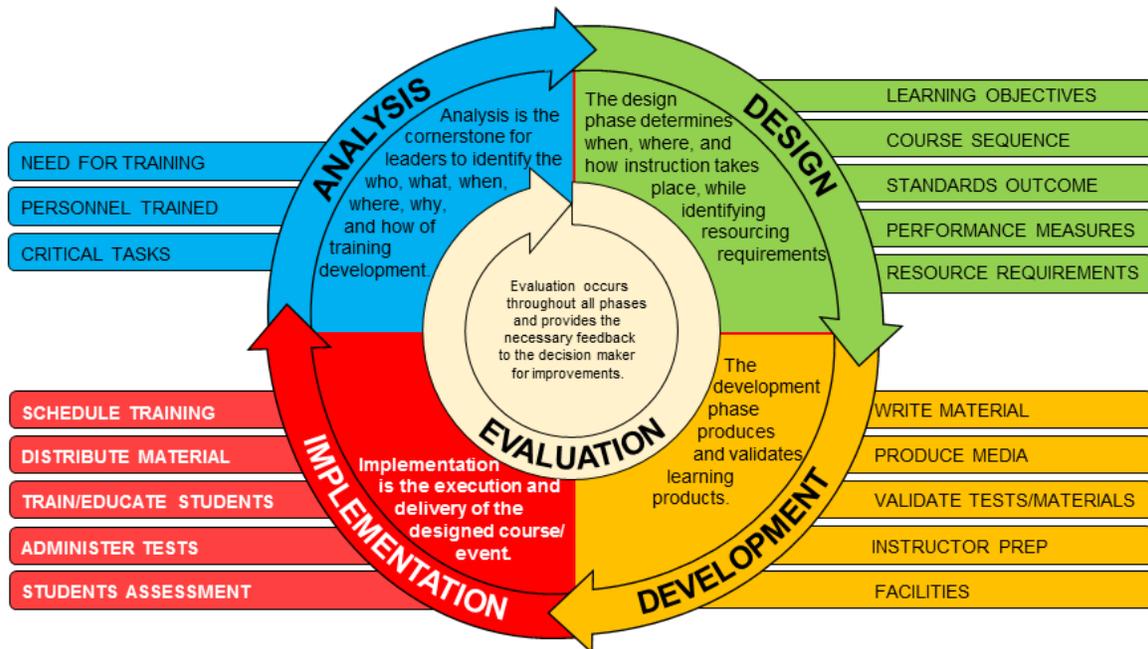


Figure 1-1. Analysis, Design, Development, Implementation, and Evaluation Process

c. The ADDIE process guides the organization and management of course/curriculum and lesson development activities to ensure training and education accomplish their stated purpose. The ADDIE process for a new training or education requirement begins with a needs analysis that identifies and validates a need for training or education; then it proceeds with job and individual task analysis, goal analysis (when appropriate), and target audience analysis. Next, the CTSSB is conducted and, at a minimum, the individual critical task statement is approved. This is followed by the creation of the remainder of the task during the design phase along with draft assessments. The development phase converts the design plans into learning product(s). Implementation is the execution and delivery of the course, module, or lesson. Evaluation takes place in all ADDIE phases. The results of evaluation support decisions to improve the learning product before implementation (formative evaluation), ensuring the training or education will effectively meet learning objectives and efficiently use critical resources. Evaluations, prepared after the completion of a course, will help determine if the course and products produced the desired learning outcomes and support decisions about the continued value and viability of the program.

(1) Analysis. The analysis phase includes analyses for various purposes. The primary analyses used during this phase are needs analysis, mission analysis, doctrine analysis, collective task analysis, job analysis, individual task analysis, goal analysis, target audience analysis, targeted audience analysis, gap analysis, and resource analysis. A thorough analysis defines critical learning requirements. This is essential for making training and education progressive, sequential, and as rigorous and relevant as possible. The learning outcome, perceived gap, or any trigger that identifies a change in learning content will determine the order and amount of detail of the analyses. Some analyses may not be necessary or may be greatly abbreviated because of the nature of the triggering event's scope. Existing analyses may eliminate the need for a particular analysis or provide input to a particular analysis. Many analyses are expansions or continuations of others. The overlapping non-linear nature of the ADDIE process is clearly present in the analysis phase.

(a) Needs. Needs analysis identifies gaps between current and required Army capabilities or performance. The analysis may indicate a required change or modification to training and education learning products. Actual or perceived performance deficiencies may be in any area of DOTMLPF-P. There may be a training solution, an education solution, or a combined solution. A needs analysis may also identify that training and education is not the proper solution. (See chapter 3 for information regarding a needs analysis.)

(b) Mission. Mission analysis is a process to review mission requirements and develop a unit task list (UTL). This process identifies unit, organizational, and functional structure; stated and implied missions; and collective and individual tasks. (See TP 350-70-1 for mission analysis relative to operational tasks and unit training procedures and chapter 3 of this publication for learning product development mission analysis.)

(c) Doctrine. Doctrine analysis aligns collective tasks with Army universal task list (AUTL) tasks and universal joint task list (UJTL) tasks and identifies the mission essential tasks (METs) needed for units to perform their missions. (See TR 350-70 for doctrine analysis.)

(d) Collective task. Collective task analysis is a direct result of a mission analysis and an approved UTL, conducted when the mission analysis process identifies gaps in unit training. The mission analysis team provides results in terms of doctrinal deficiencies in the proponent missions and/or tasks in order to conduct collective task analysis. (See TP 350-70-1 for collective task analysis procedures.)

(e) Job. A job analysis is a type of analysis used to identify individual tasks (including leader tasks) the job incumbent must perform to accomplish the mission and duties of a specific military occupational specialty (MOS)/area of concentration (AOC) or function. The outputs of a job analysis are the TTI, field survey data, individual task performance data, supporting knowledge, skills, and attitudes. After this, the CTSSB team begins to assess the TTI, produce task selection model data, and develop an ICTL. Job analysis also is used to identify staff functions. (See chapter 4 for JA details.)

(f) Individual task. Individual task analysis is the basis for determining the performance specifications (action, condition, and standards) for each individual task. It breaks down a task

into performance steps, if applicable, and identifies the knowledge, skills and attitudes components of the individual task. An individual task analysis provides the basis for translating job performance information into learning objectives. The learning objectives then form the basis for designing and developing lessons and courses. (See TP 350-70-1 for individual task analysis procedures and chapter 4 of this publication for individual critical task analysis relative to learning product design and development procedures.)

(g) Goal. Goal analysis identifies specific performance or action statements from broadly stated course outcomes. Goal analysis determines the domains of knowledge that developers encompass in course outcomes, which may also include a list of subjects the learner must learn. These performance or action statements can then be broken down into knowledge, skill, and attitude components and translated into learning objectives upon which to base the design and development of lessons that comprise the course. (See chapter 4 for goal analysis procedures.)

(h) Target audience. Target audience analysis uses the following elements to inform curriculum design, development, and implementation: job history, skill and knowledge level, reading grade level, previous training received, math skill level, Armed Services Vocational Aptitude Battery (ASVAB) scores required for the job, civilian education level, time in grade/service, time in duty position, workplace conditions, demographics, computer literacy level, maturity, motivation to learn, interests, and attitudes. Target audience analysis accomplishes several different purposes, such as identifying and describing the individuals who perform all the tasks associated with a specific job or function taught. The target audience, in this instance, is the group of people made up of the job incumbents. A common mistake is confusing target audience analysis with pre-assessment targeted audience analysis. (See chapter 5 for target audience analysis.)

(i) Targeted audience. Targeted audience analysis identifies the skills, knowledge, experience, and attitudes of the learners who will be attending or are currently attending a learning event. The targeted audience analysis facilitates collection of data to shape course presentation and to identify potential assistant instructors/facilitators. (See chapter 5 for target audience analysis.)

(j) Gap. Gap analysis compares the desired educational outcome with the learner's pre-instruction skills, knowledge, experience, and attitudes determined in the targeted audience analysis. (See chapter 5 for gap analysis.)

(k) Resource. Resource analysis identifies resources and constraints. Resident and nonresident/DL resource requirements are critical factors in course development. They require consideration during the entire process from initial planning, through instructional development, to course implementation and maintenance. Resource analysis identifies and lists resource requirements in the areas of equipment, facilities, funds, personnel, and time. Early planning of resources will help manage the time involved in securing these resources. Updating resource analysis throughout the ADDIE phases will capture changes in the resources required for the course. (See chapter 2 for resource analysis.)

(2) Design. The design phase begins after the commander/commandant approves individual critical tasks or, at a minimum, the task title, as an output of the CTSSB. The TNGDEV confirms expected outcomes, articulates and verifies TLOs, and generates a draft individual student assessment plan (ISAP) to measure learners' performance.

(a) After the course manager obtains approval of the individual critical tasks he/she then creates a course content outline and delivery methods and develops the learning context. To create a product that meets all requirements at the appropriate level, the course manager must maintain focus on the learning objective(s) for each lesson and keep them aligned with commander/commandant-approved educational outcomes and general learning outcomes (GLOs). (See figure 2-2 for a list of GLOs.)

(b) After the course content outline is complete, the course manager determines lesson sequencing and progression within a course, phase, or module, and determines the learning steps and activities, learner assessment methods, methods of instruction (MOIs), media, and/or other learning resources needed for each lesson.

(3) Development. The development phase involves choosing the structure and methods to translate design plans into learning materials and activities that achieve learning objectives. This includes identifying all support materials, as well as identifying implementation and evaluation plans. Development steps are included in this Pam or external links.

(4) Implementation. The implementation phase is the execution of the phase, module, or course according to the course management plan (CMP). Implementation occurs after the design, development, validation, and formal approval for use of learning products. Each proponent institution develops detailed standard operating procedures (SOPs) to meet instructional needs and resources for implementation. (See chapter 10 for implementation information.)

(5) Evaluation. Evaluation is a continuous quality measurement process that starts during the analysis phase and continues throughout the ADDIE process, to appraise the quality of a process, product, or program. Formative evaluation of learning products enables proponents to adjust and approve the learning products and instruction before implementation. Summative evaluation after implementation will help determine if the course and products produced the desired learning outcomes. Evaluation permeates all ADDIE phases, and the results of the evaluation inform decisions for improvements to ensure training, education, and supporting learning products meet learning objectives and use critical resources efficiently. Evaluation also includes quality measurement at the program level. (See chapter 12 for evaluation information.)

d. Management of the ADDIE process is a leadership function. Army leaders, directors of training and education, course managers, TNGDEVs, and instructor/facilitators at all levels ensure compliance with the ADDIE process to develop learning products and prepare for implementation. All those involved perform the following management functions:

(1) Create and maintain appropriate validation, evaluation, and assessment plans.

(2) Provide supervision of learning product development and provide team assistance when needed to ensure the work at hand flows smoothly and efficiently.

(3) Meet project timelines and milestones while maintaining quality.

(4) Ensure the entire ADDIE process operates within a given set of resources, as determined during the analysis phase of ADDIE.

(5) Establish internal QC throughout the ADDIE process in order to maintain high standards.

1-9. Regulation and pamphlet relationship

a. TR 350-70 consolidates policy for Army-wide production, implementation, and evaluation of Army learning products across the operational, institutional, and self-development (OISD) training domains. This regulation and its associated pamphlets fulfill many of the requirements identified in AR 350-1 for the Commanding General, TRADOC, as the proponent for the Army TED process.

b. The TP 350-70 series of pamphlets provides how-to guidance on TED in the training domains, as well as for various training and education management control processes. This Pam provides guidance for the creation, revision, and management of institutional learning products.

c. The TED-T website contains procedural JAs, product templates, product samples, information papers to assist in completing learning products, and links to various external professional education sources at <https://cacmdc.army.mil/armyu/TEDT/Pages/Toolbox.aspx>.

Chapter 2

Proponent Requirements and Support of Institutional Training and Education Products

2-1. Introduction

a. TRADOC is the Army's proponent for training, education, and the leader development process and is the accreditation authority for Army training and education institutions across all components Regular Army (RA) and Reserve Component (RC), except for the U.S. Military Academy.

b. As the proponent for Army TED, CAC supports and integrates Army training and education across all cohorts in support of Army Sustainable Readiness. See TR 10-5-4 and TR 350-70 for additional CAC command and staff responsibilities.

c. Training proponents:

(1) Develop courses based on established training and education needs, goals, requirements, and objectives, as well as the duties, responsibilities, and functions their graduates will be assigned.

(2) Provide progressive and sequential training and education to Soldiers and DA Civilians.

(3) Use the Training Support System. Coordinate development and proper resourcing of all institutional learning products, courseware, and training systems with CAC to ensure relevant live, virtual, and constructive training enablers have been considered and integrated to facilitate conducting effective and efficient learning courses and/or events.

(4) Analyze, design, develop, implement, and evaluate learning products for Soldiers and DA Civilians.

(5) Choose an appropriate learning taxonomy in the development of learning objectives that best supports the individual learning plan (ILP) and/or PME/CES needs of the Soldiers and DA Civilians trained and educated at the proponent center and/or school. Course design drives the learning taxonomy used. This Pam uses different types of taxonomy for example only and not as a requirement specifying a particular taxonomy's use. Proponents may use these taxonomies or another taxonomy of their choice, provided it is employed consistently throughout the course.

2-2. Training proponent information and identification numbers

Visit the TED-T website for the latest TRADOC training proponent school codes relating to Army training and education functional areas at

<https://cacmdc.army.mil/armyu/TEDT/Pages/Toolbox.aspx>.

2-3. Institutional training and education system

The Army institutional training and education system encompasses Army COEs/schools that provide IMT and subsequent PME/CES and functional training for Soldiers and DA Civilians throughout their careers.

2-4. Mandatory training in institutions

Mandatory training in institutions consists of Headquarters, Department of the Army (HQDA)-selected general subject areas in which individual Soldiers and DA Civilians must be proficient to perform satisfactorily in a military organization, regardless of branch/career field or rank/grade. Mandatory training requirements are limited to those subject areas directed by law and HQDA. The HQDA, Deputy Chief of Staff (DCS), G-3/5/7 maintains centralized control over mandatory training requirements and reviews them biennially. (See AR 350-1 for the current list of mandatory training.)

2-5. Foreign disclosure restriction statements

Appropriate foreign disclosure (FD) restriction statements are on the cover of every Army learning product (and component) that contains classified military information or controlled unclassified information. There must be one FD restriction statement for the learning product as

a whole, one for each lesson, and one for each document used as a resource for the learning product. Learning products that contain publicly releasable information without restrictions still require an FD statement. (See AR 380-5, AR 25-55, AR 380-10 , DA Pam 25-40, and TR 350-70 for information on restriction statements.)

2-6. Intellectual property/copyrighted/proprietary materials

a. Intellectual property is defined as a product of the human mind, protected by law. It includes, but is not limited to patents, inventions, designs, copyrights, works of authorship, trademarks, service marks, technical data, trade secrets, computer software, unsolicited inventive proposals, and technical expertise. (AR 27-60 describes the intangible rights in such property as intellectual property rights.)

b. TNGDEVs and instructors/facilitators:

(1) Ensure proper handling, use, and distribution of intellectual property, including copyrighted material.

(2) Maintain an audit trail of all source data, such as source document page, paragraph, title/number, and date.

c. Absent any statutory or other exception, using intellectual property, such as copyrighted material, without permission of the intellectual property right holder, is a violation of law and Army policy. TNGDEVs must obtain the appropriate written authority/permission from the property owner prior to using a third party's intellectual property in the development and implementation of training programs, products, and materials. (Obtain a legal opinion if needed, and document/maintain all permission documentation.) This applies, but is not limited to written material, graphics, video, development programs, and interactive multimedia instruction (IMI) products. TNGDEVs must perform the following actions prior to using copyrighted material and other intellectual property:

(1) Determine if the material is intellectual property consistent with the above definition. For example, copyright notices are optional for works published on or after 1 March 1989. Therefore, treat all works, particularly those noted above (written material, graphics, video, development programs, and IMI products) as protected intellectual property unless it is determined not to be, or an exception or exemption has been identified and a legal opinion obtained.

(2) Include the servicing Office of the Staff Judge Advocate (OSJA) in staffing procedures prior to purchasing any intellectual property/copyrighted materials for inclusion in training products/materials and consult with them to ensure the following reviews are accomplished:

(a) Review/determine whether the Army or TRADOC has any current rights for the use of existing intellectual property materials for training purposes. The Government may have entered into a funding agreement with a company where it was agreed that any data produced would be with "government purpose rights." A final report with government purpose rights or a portion

thereof could be used in Army training materials, yet many times International Traffic in Arms Regulation restrictions apply to our reports or there may be designation or classification issues which would go back to the obtain approval for use in courseware step.

(b) Have an attorney review the end-user licensing agreement, for any objectionable terms before the purchase of any software license.

Note. You can buy a specific number of software licenses or you can have an enterprise license for a massive organization.

(3) Have a software/IP rights strategy in mind before beginning. Determine what is needed. Consider buying commercial, off-the-shelf software or contracting for a company to make something specific. If paying for the contract, then get unlimited rights as a result of the contract. If software that teaches something is needed and it is available off-the-shelf, then buy it. One should acquire the rights necessary to maximize Army investment in programs and materials developed exclusively at private expense. This includes the following acquisition actions:

(a) Obtaining the royalty-free rights for Government use, duplication, modification, and disclosure of the material.

(b) Obtaining the minimum rights in IMI computer-based instruction necessary to accomplish the requirement.

(c) Ensuring life cycle availability of any authoring program, software that allows for the creation of tutorials, computer based training courseware, websites, compact disc (CD) -ROMs and other interactive programs.

(d) Obtaining access to all associated software libraries and materials necessary to design/revise the training product.

d. Publishing or disseminating copyrighted digital material without proper permission is a violation of copyright law, to include the Digital Millennium Copyright Act. TNGDEVs must review all printed materials to be placed in digitally delivered formats to determine if they contain any copyright protected material. If any copyright protected material is present, TNGDEVs must contact the owner of the material and request permission to use the material in a document or program placed on the Internet or delivered by other digital means (such as CD and digital video disc (DVD)). TNGDEVs must obtain permission for the specific use of the material delivered via the Internet or by other digital means (CD, DVD); any original copyright permission or license granted for printed materials is not sufficient.

(1) If permission is granted, the permission document becomes part of a 150 year record.

(2) If permission is not granted and it is determined that publishing or distributing the copyrighted material digitally would otherwise violate copyright law or any existing permission or license, the material must be removed from the document.

(3) TNGDEVs must maintain a record copy of any document (including the contract or any other document) that grants permission/authority to use any material identified as intellectual property.

e. Consistent with 17 U.S.C. § 107, “fair use” provides the ability to use a copyrighted work under certain conditions without permission of the copyright owner. Fair use requires a fact-based, detailed case-by-case analysis conducted by the servicing OSJA, in concert with copyright attorneys at USALSA, as necessary. Refer to AR 27-60, DA Pam 25-40, DA Pam 25-91, TR 25-36 and TR 350-70 for more information regarding Army copyright policy.

Note. There is no universal “fair use exception” to a copyright holder’s rights simply because the user happens to be a Federal Government employee or because the use involves teaching or training, or the use is intended for not-for-profit purposes.

2-7. Training and education development planning and management

a. A proponent will only revise or develop institutional products to which they are assigned. This does not include U.S. Army Materiel Command and Defense Logistics Agency. The development or revision of non-proponent products will be coordinated with and approved by the designated proponent in order to maintain consistency in institutional products. ArmyU maintains the official training and education proponent listing electronically on the TED-T website, <https://cacmdc.army.mil/armyu/TEDT/Pages/Toolbox.aspx> which identifies authorized COEs/schools that develop all Army learning products within their respective fields of expertise. (See TR 350-70 for functional area and proponency details.)

b. Proponents may choose to outsource training development tasks through contracting measures.

c. Proponents will ensure the development of learning products is synchronized with the budgeting and resourcing processes and systems in order to acquire the necessary resources, on time, and at the right place. Proponents accomplish this by performing an initial resource analysis in the analysis phase and updating the analysis in the other ADDIE phases. Resource analysis includes the following steps:

(1) Determine the resources (equipment, facilities, funds, personnel, and time) needed to support the lesson in a resident and nonresident/DL environment.

(2) Identify available resources. Available resources influence planning for lesson design, development, and implementation.

(3) Identify constraints. Every lesson has constraints, such as maximum length, manpower, budget, and learner load. Ignoring these constraints may lead to an instructional package that is either too large for the time allotted or that requires too large a share of resources compared to the relative importance of the lesson to the course and to the proponent’s mission. If faced with a resource constraint, proponents select an alternative strategy or delivery approach.

(4) Identify alternatives.

d. Proponents plan and manage the development of learning products by creating a milestone plan in the analysis phase and updating the plan in the other ADDIE phases. It is legally imperative that the TNGDEV have proper copyright permissions before releasing the materials. Creating a milestone plan includes the following steps:

(1) Determine the date the materials are due in the classroom.

(2) Identify any specific proponent/department administrative requirements and guidance.

(3) Determine the date the materials must be available in resident distribution.

(4) Contact APD or Defense Logistics Agency Document Services to inquire about printing requisition lead times.

(5) Determine the date for the formative evaluation of the lesson materials to include assessment instruments.

(6) Establish the completion date for all edits of the lesson materials.

(7) Be aware there may be budgetary implications and can take an inordinate amount of time to obtain required copyright permissions.

(8) Set dates for faculty content workshops.

(9) Identify any specific milestones possibly missed.

(10) Review proponent/department supplemental guidelines.

2-8. Interfacing with other Army systems and processes

Learning product managers should have a high level of knowledge of learning product development processes, the automation tools available for learning product development, and how these tools interface with other Army systems. TDC is the primary automated tool used by Army (TRADOC and non-TRADOC) schools and centers to create, edit, and manage all training and education products that support both the institutional and operational forces. TDC is one of several important training and resource-related systems including but not limited to requirements determination and acquisition process, manpower and personnel integration; planning, programming, budgeting, and execution; training requirements analysis system (TRAS); the GTA program; System Training Plan Writing Tool; and the Army Training Management System. Together, these systems provide the capability for ensuring the accomplishment of DOTMLPF-P requirements from identification of a gap to implementation of the training and/or education solution. (See TP 350-70-13 for more information).

2-9. Application of Army Learning Model

The ALM is the operational term for a continuous adaptive learning model described in TP 525-8-2. The ALM establishes a framework that will transform the Army's individual learning methods and processes in support of the U.S. Army Learning Concept for Training and Education 2020-2040 principle of developing adaptable Soldiers and leaders. TRADOC schools are incrementally implementing the ALM, using advancements in learning sciences to change instructional strategies to create more facilitated, collaborative learning events that engage learners, employ digital learning content, use relevant operational environment scenarios, and capitalize on blended learning approaches. TRADOC is also in the process of transforming the skills of faculty and staff personnel by implementing new development programs, adapting curricula development, and beginning analysis of course resource models to align with the ALM. TRADOC will continue to develop and adapt its governance, delivery, development, instruction, knowledge management, QA, planning, and resourcing processes and models to implement the ALM. TNGDEVs should incorporate the instructional guidelines found in TR 350-70 during the ADDIE process to create rigorous, effective, and relevant learning products.

Chapter 3

Operational Force Drivers of Institutional Training Domain Learning Products

3-1. Operational force drivers of institutional training domain learning products introduction

a. This chapter provides information regarding the relationship between the readiness requirements of the operational force and the learning products used primarily by the generating force within the institutional training domain. The chapter introduces the Army Readiness Model and process, needs analysis process, analysis processes for learning products, and mission analysis process for learning product development. It also notes the requirement to include safety, risk management, and environmental protection in all training and training development.

b. Proponents primarily develop individual training and education to support unit readiness based on the force's needs. The needs analysis and mission analysis processes identify the force's needs. The needs analysis checklist JA on the TED-T website, <https://cacmdc.army.mil/army/TEDT/Pages/Toolbox.aspx> provides additional information on needs analysis, and TP 350-70-1 provides more information on mission analysis. The Army must train and educate Soldiers, DA Civilians, and units to perform under realistic and stressful conditions to survive and win in the full range of military operations. This realistic training must ensure the well-being of Soldiers and DA Civilians during training and assure protection of the environment.

3-2. Army Readiness Model

The Army Readiness Model is the Army's current process to man, train, equip, sustain, and assign missions to units in a manner that best maintains readiness.

3-3. Needs analysis

a. Needs analysis description. A needs analysis is a vital process that identifies gaps between current and required Army capabilities or performance. A needs analysis may indicate a required change or modification to training and education learning products. Actual or perceived performance deficiencies may be in any area of DOTMLPF-P domains. DOTMLPF-P changes may require new and/or revised learning (training and education) strategies. Many variables drive changes to Army learning products, including changes to any element of DOTMLPF-P. Other variables include solutions identified from observations, lessons learned and best practices, after action reviews (AARs), and interviews to remedy performance gaps in training and education, and/or solutions directed by the commander and/or commandant and/or higher headquarters (HQ). There may be a training solution, an education solution, or a combined solution. A needs analysis may determine training and/or education are not the proper solutions for performance deficiencies or identify training and/or education that are no longer needed. A complete needs analysis identifies the following problem-related areas:

- (1) A specific performance problem.
- (2) The operational environment triggering the performance problem.
- (3) The root cause of the performance problem.
- (4) Other DOTMLPF-P solutions to mitigate the performance problem.
- (5) Current training and education solutions addressing the performance problem.

b. Needs analysis process. A needs analysis identifies performance shortfalls and identifies training and non-training solutions to those shortfalls. The needs analysis enables the identification of any gaps between desired and actual performance. A gap is the difference between what exists now and what is required. It may identify capabilities required to meet future contingencies that may result in changes in the DOTMLPF-P domains. The needs analysis process includes the following steps:

- (1) Review the literature.
- (2) Identify the true performance deficiencies.
- (3) Collect supporting data for training deficiencies.
- (4) Identify the major causes of performance problems.
- (5) Identify those responsible for correcting the problem.
- (6) Identify and analyze courses of action.
- (7) Recommend the best alternative.

c. Needs analysis outputs. The output of a needs analysis could indicate a requirement for the modification or creation of a learning product, or a change in how to present material. Needs analysis outputs include the following types of solutions and/or requirements:

- (1) Training and education solutions or improvements, as applicable.
- (2) Recommendations for non-training solutions, as applicable.
- (3) Learning product development requirements.

d. Needs analysis data flow. Figure 3-1 depicts the flow of information in the needs analysis process. Deficiencies in one or any combination of the DOTMLPF-P domains may cause unacceptable performance.

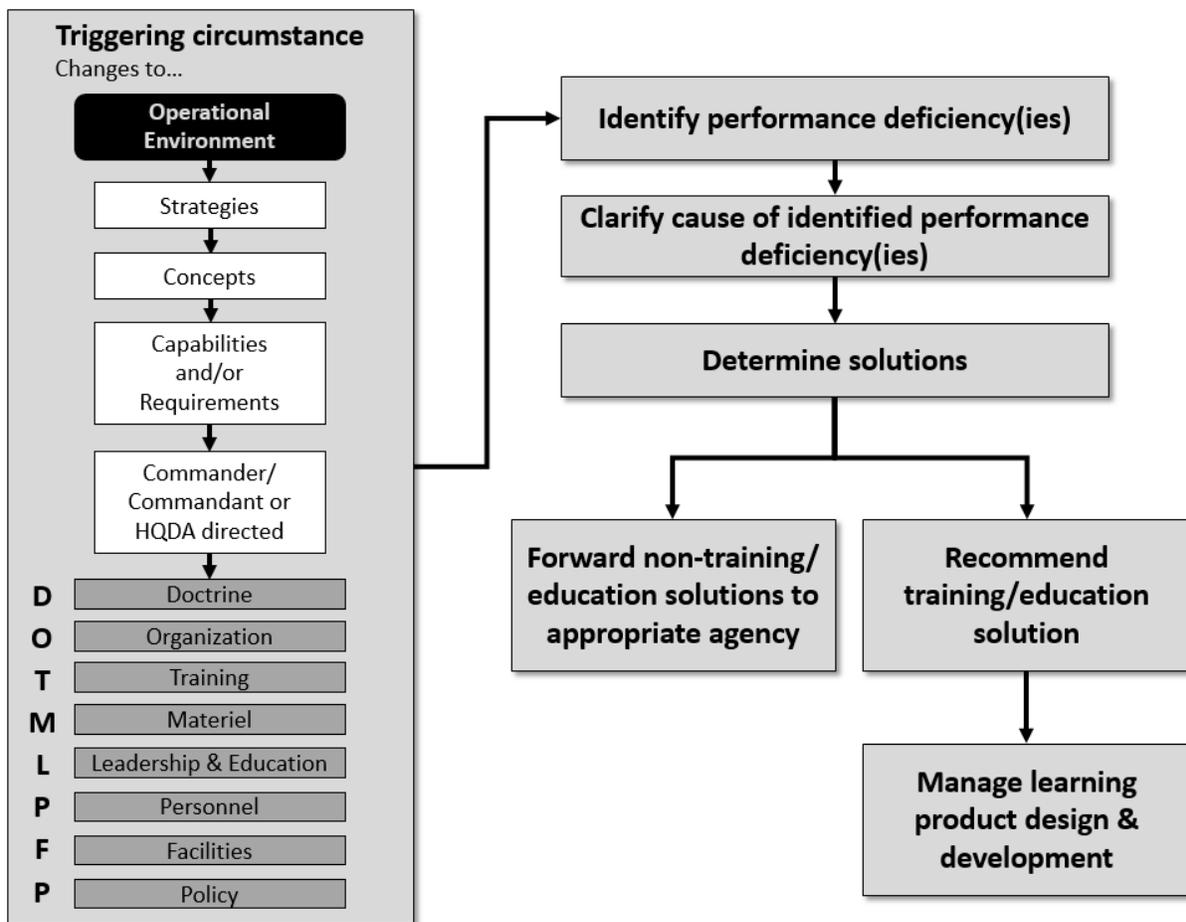


Figure 3-1. Needs analysis data flow

3-4. Needs analysis team roles and duties

The most efficient way to conduct a needs analysis is to establish a needs analysis team, consisting of individual experts with the right combination of skills and knowledge as outlined below. As a whole, the needs analysis team identifies valid training development and training requirements.

a. Proponent. The proponent ensures a thorough, efficient, and effective needs analysis. The proponent is reactive (identifies deficiencies between what exists now and what is required) or proactive (identifies capabilities required to meet future contingencies that may result in changes in the DOTMLPF-P). The needs analysis team completes the following actions:

- (1) Identifies the triggering circumstances.
- (2) Collects supporting performance deficiency data.
- (3) Identifies the performance problem gap between the desired and actual performance.
- (4) Identifies all major causes of performance problems.
- (5) Documents the identified deficiency(ies).
- (6) Identifies those responsible for correcting the identified deficiency(ies).
- (7) Identifies possible solutions to the performance deficiency(ies).
- (8) Analyzes identified courses of action.
- (9) Recommends the best alternative solution(s).

b. TNGDEV. As the subject matter expert (SME) for needs analysis, the TNGDEV performs the following actions:

- (1) Prepares documentation relevant to conduct the needs analysis.
- (2) Provides needs analysis guidance to the SMEs and managers.
- (3) Presents a briefing that details what to do during the needs analysis process.
- (4) Maintains needs analysis documentation.

c. SMEs. SMEs have a role in the conduct of a needs analysis and complete the following actions:

- (1) Provide information relative to technical expertise.
- (2) Provide supporting data for training deficiencies.
- (3) Recommend possible alternatives, including non-training solutions.

d. Commander/commandant or designated representative. The proponent commander/commandant is the approving authority for the needs analysis and signs the prepared document.

e. Evaluator. The evaluator serves as an independent observer, providing QA/QC of the process and work. The evaluator performs the following actions:

(1) Determines if the needs analysis team conducted the analysis properly and makes comments/recommendations appropriate to the needs analysis team and the commander/commandant.

(2) Ensures the needs analysis addresses the Soldier and unit performance in the RA and RC, when appropriate.

3-5. Needs analysis initiation

a. A needs analysis is usually initiated (or triggered) when the proponent receives notification of an actual or perceived performance deficiency. The TNGDEV then determines what initiated the unacceptable performance, or what cue was missing that hindered performance of the required action. Needs analysis triggering circumstances are presented to TNGDEVs in formal or informal reports (See table 3-1), and these triggering circumstances may originate from a wide variety of sources, such as the following:

(1) Evaluation findings. Evaluation is a continuous process to identify training and education efficiencies and deficiencies that feed back into the development cycle.

(2) Field/other input. Feedback from personnel assigned to operating force units is essential to identify training and education needs. Other excellent sources of unit feedback include combat training center (CTC) personnel and threat managers from the Army's centers of excellence (COEs). Additionally, the CAC Center for Army Lessons Learned (CALL) plays a vital role in the identification of potential training deficiencies.

(3) Long-range plans and new capabilities. Inputs to consider during analysis for training or education development requirements are the TRADOC long-range training plan, Army long-range planning guidance, ALM, the Army plan, warfighting concepts and experiments, training and education strategies, advanced concept technology demonstrations, and capability documents provided by the capabilities development and integration directorates.

(4) Directed training. Common core and shared training requirements occur when higher commands, senior officers, laws, and regulations direct training of common military and other subjects. This includes training directed by HQDA and Army commands.

Table 3-1
Needs analysis triggering circumstances for identifying performance problems

<p>Formal Reports</p>	<ul style="list-style-type: none"> • Requirements determination process capability requirements (Army Modernization Plan) • New equipment fielding • Battle lab initiatives • Unit materiel readiness reports • Memorandums/e-mails from units/Soldiers • Audits, inspections, and evaluations (internal and external) • Safety reports • Lessons learned reports (CTC/CALL reports) • Introduction or restructuring of MOS/AOC • Training effectiveness analysis reports
<p>Informal Reports</p>	<ul style="list-style-type: none"> • Commander’s verbal comments • Personal observations • Learner comments • Telephonic comments followed up with documentation • AAR
<p><i>Note.</i> Consider all factors, particularly the reliability of the information, when assessing formal and informal performance reports.</p>	

b. To ensure the Army provides the right education/training to its Soldiers, the TNGDEV conducts a new—or updates an existing—needs analysis before the development of individual education/training products.

3-6. Needs analysis advance preparation

Before performing a needs analysis, the needs analysis team must gain a thorough knowledge of all factors that impact the performance problem, or that the solution of the performance deficiency could affect. The needs analysis team executes the following actions before performing a needs analysis:

- a. Acquires and thoroughly analyzes the existing literature and performance data, which should provide the needs analysis team the knowledge required to isolate the real problem(s) from the apparent or assumed problem(s).
- b. Locates and obtains any additional copies of documentation that provide information or data useful in the definition/clarification of the performance deficiency(ies).
- c. Collates the information into a logical order or grouping before continuing the analysis and verifies all references are current. (See figure 3-2, examples of needs analysis documentation and data sources).

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Task analysis • Operational concepts • Capability issues • Threat • Doctrine • Material acquisition • Table of organization and equipment • Subject matter expert interview | <ul style="list-style-type: none"> • Observations • Center for Army Lessons Learned data • Regulations and pamphlets • Evaluation reports • Related reports and/or interview data • Command directives and documents • Table of distribution and allowances • Learning products |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Figure 3-2. Examples of needs analysis documentation and data sources

d. Determines the requirements by performing the following actions:

(1) Analyzes documentation and data to identify requirements such as task standards and legal or regulatory requirements. For example, Soldiers must be able to don a protective mask in less than nine seconds.

(2) Documents whether a cue triggers the required performance (documents the nature of the cue) or whether or not there is a required sequence of performance. For example, the cue to don the protective mask is either a verbal order or another sign indicating the presence of chemical contaminants.

3-7. Identify performance problem

The needs analysis team identifies and describes the problem(s) in exact terms to determine a solution. The needs analysis team describes the problem without assigning a cause or identifying a solution domain DOTMLPF-P. (See table 3-2 for performance problem statement examples.)

**Table 3-2
Performance problem statement examples**

Acceptable	Unacceptable
Soldiers do not install the radio frequency antenna correctly.	Soldiers do not know how to install the radio frequency antenna correctly. Discussion: Implied cause is a training deficiency.
Soldiers could not repair the equipment.	Soldiers lacked test equipment needed to perform the repairs. Discussion: Identified cause of the performance deficiency.
Units cannot successfully engage enemy armored vehicles in excess of 5,000 meters.	We need a new tank. Discussion: Implied cause is a solution domain.

a. The needs analysis team defines the required performance in order to identify the performance problem. The required performance forms the baseline for determining the accuracy and/or extent of the identified deficiency. The needs analysis team follows these steps:

(1) Describes the required performance in terms of task standards, learning objectives, and legal or regulatory requirements.

(2) Documents the performance requirement if any of the following conditions exist:

(a) A cue triggers the required performance. (The needs analysis team documents that cue and the nature of the cue.)

(b) The performance requirement takes place regardless of whether a sequence of performance is or is not required.

b. The needs analysis team states the problem and performance deficiencies in the following formats:

(1) In terms of collective tasks and/or learning objectives that create problems in units.

(2) In terms of task standard deficiencies in performance of a task that Soldiers cannot meet.

(3) In terms of desired performance of future required capabilities that Soldiers, or units must attain.

c. The needs analysis team identifies specifically who or what organization is not performing to the required standard. The team identifies the issues in terms of the following items:

(1) Enlisted/warrant MOS/ASI/SQL.

(2) Officer AOC/functional area/SI.

(3) Skill level/rank.

(4) Common Soldier tasks, common skill level tasks, and shared tasks.

(5) Unit (table of organization and equipment/table of distribution and allowances number, unit identification code, and name).

3-8. Identify problem in terms of learning outcomes

A learning outcome is a statement that indicates the level and type of competence a learner will have at the end of a course. Furthermore, it specifies what a learner should learn as the result of a period of specified and supported study. The needs analysis team executes the following actions:

a. Documents the problem in terms of how learning products or programs address these outcomes.

b. Documents the problem in terms of collective and/or individual tasks, and documents problems in terms of any task standard or learning objective(s) that Soldiers cannot meet. Identifies who or which organization is not meeting the requirement.

c. Describes the current situation with the same descriptors used to describe the requirement. For example, Soldiers in MOS 11B, 11C skill levels 2-4, and officers in AOC 11A (all levels) take 22 seconds to don a protective mask.

d. Identifies the problem by describing the difference between the requirement and the current situation. For example, Soldiers are taking more than twice the required time to don their masks: 22 seconds (current situation) – 9 seconds (requirement) = a gap of 13 seconds.

e. Follows up immediately on all safety, security, or environmental problems.

3-9. Establish scope

The needs analysis team establishes the scope of the performance problem to determining the extent and gravity of the problem in order to establish the priority. (See table 3-3 for the scope of performance problem factors.) To help establish the scope for the performance deficiencies, the needs analysis team performs the following actions:

a. Applies the knowledge gained when conducting the literature search.

b. Communicates with individuals directly involved in the performance.

c. Communicates with observer/controllers from training centers about their observations of performance.

Table 3-3
Scope of performance problem factors

Extent	Identify whether the problem is isolated or widespread among units throughout the Army.
Gravity	Identify the safety, environmental, or security impact of the problem.
Impact	Identify the specific impact on individual and unit performance. Check to see if there are mission consequences. If no mission consequences, it may not be necessary to pursue the matter further.

3-10. Clarify cause of identified performance deficiency(ies)

The needs analysis team identifies the actual cause (or combination of causes) of the identified performance deficiency(ies). It is essential to precisely define and clarify the identified problem in order to develop ideas for solutions and courses of action. The needs analysis team can use the sample root cause checklist JA, located on the TED-T website, to identify root causes. (See table 3-4 for several possible sources for problems related to environmental and individual issues.) To

identify the cause of the gap, the needs analysis team must collect supporting data and conduct the following actions:

- a. Compiles the required and actual performance data.
- b. Collates and displays the required and actual performance data in a manner that enhances the capability to identify the real cause of the deficiency.
- c. Compares that data to reveal the true cause(s) of the performance deficiency(ies) and other influences on that performance.

Table 3-4
Potential sources of problems related to environmental and individual issues

Environmental	Individual
<ul style="list-style-type: none"> • Tools/resources • Incentives/rewards • Policies/procedures • Information/feedback • Management 	<ul style="list-style-type: none"> • Skills • Knowledge • Motivation (confidence, value) • Capability

3-11. Identify solutions to performance deficiency(ies)

The needs analysis team completes the following actions to identify solutions to the performance deficiency(ies):

- a. Identifies the responsible DOTMLPF-P domain for correcting the problem. (See table 3-5 for DOTMLPF-P problem example.)

**Table 3-5
 Doctrine, organization, training, materiel, leadership and education, personnel, facilities,
 and policy problem example**

Problem	DOTMLPF-P domain	Possible causal area
A brigade has a requirement to deploy within 24 hours after receiving the deployment order. Exercises have shown the average time to execute the deployment is 36 hours (a 12-hour performance gap)	Doctrine	Soldiers are following doctrinal loading procedures that take significantly longer to complete than other updated methods that are not in doctrine.
	Organization	The sustainment battalion is at 50 percent strength.
	Training	75 percent of the pallets do not pass inspection the first time they are loaded. Soldiers do not know how to load equipment and material onto pallets correctly.
	Materiel	The unit does not have forklifts to load heavier equipment onto trucks for movement to the loading facility. Groups of Soldiers load this equipment manually and require significant time to load the equipment safely.
	Leadership and education	Leadership did not take action to correct the personnel issue or space limitations.
	Personnel	Soldiers wait for pallets to be inspected, causing delays. Is it lack of Soldier initiative, or is it a workforce deficiency issue causing the delays?
	Facilities	Space limits in the pallet loading facility prevent multiple companies from simultaneously loading pallets.
	Policy	Unit SOP has not captured best practices and lessons learned to improve proficiency.

b. Defines and clarifies the identified performance deficiency(ies) in order to develop ideas for solutions and courses of action. Implementing non-training solutions may provide more cost benefit than a training solution. Incorrectly applying a training solution to a deficiency may not correct the deficiency and may waste time and money.

c. Identifies non-training or policy solutions as well as training development/training solutions. Non-training solutions are in the doctrine, organization, materiel, leadership and education, personnel, facilities, and policy areas of the DOTMLPF-P. Although the non-training solutions may not be in the needs analysis team’s areas of expertise, a thorough analysis of the problem will reveal deficiencies in these areas.

(1) The needs analysis team provides recommendation(s) for non-training solution(s) for the performance deficiency to the appropriate office or agency. Although others develop non-training solutions, the needs analysis team documents, justifies the determination, and provides the information to the appropriate command authority.

(2) Non-training solutions are tentative solutions until the appropriate command organization resolves the issue. The needs analysis team should consider involving capability developers in the needs analysis process from the beginning if the deficiency appears to cross DOTMLPF-P domains. The following are examples of non-training solutions:

- (a) Providing spare parts needed to conduct the repairs.
- (b) Assigning personnel trained to perform the required ASI to the unit.
- (c) Revising doctrine.
- (d) Having command leadership motivate subordinates to perform tasks to prescribed standard.
- (e) Restructuring an organization to improve workflow.

d. Combines solutions to resolve a performance deficiency. For example, it may require a combination of actions such as a leadership and a materiel solution to solve the deficiency. A solution consists of one or more training solutions (for example, Soldier and unit), multiple non-training solution(s) (for example, leadership and materiel), or a combination of the two solution categories.

(1) The needs analysis team must consider that a non-training solution to a performance deficiency may create a new performance deficiency and result in a need for education/training. For example, the requirement to change doctrine to correct a deficiency will result in a requirement to provide education/training on the new doctrine. Where the cause of the performance deficiency is Soldier motivation, training may not be required.

(2) The needs analysis team identifies partial training solution(s) to the deficiency(ies).

3-12. Recommend solution(s) to performance deficiency(ies)

a. The needs analysis team recommends the most effective or best solutions and alternatives to correct the performance deficiency and provides justification for the determination(s) to the appropriate command authority. All potential solutions and alternatives are tentative solutions until the appropriate command authority works to resolve the issue(s). The recommendation process involves the following actions:

(1) Recommends solutions and alternatives for both non-training/education problems and training and education deficiencies. Resolving the problem may require a combination of actions, or a partial training and education solution.

(2) Submits courses of action and recommended solutions (including integration of critical operational lessons learned) to the command authority for approval. Writes documents (such as decision papers and command briefings) that concisely convey the scope and nature of the solutions related to the problem.

(3) Outlines the training and/or education solution where the command authority can readily see the impact if it is not implemented. Depicts the cost of failing to correct the problem.

(4) Articulates the strengths and weaknesses of each possible solution.

b. The needs analysis team communicates or articulates how a solution might be implemented to prevent continued performance deficiencies. To facilitate the solution implementation, the needs analysis team communicates that solution to the appropriate command authority through the following actions:

(1) Creates documents to outline training solutions where the viewer can readily see the effect of a solution not implemented.

(2) Obtaining appropriate command authority approving the recommended training solution(s) and/or training development requirement(s).

(3) Determining which office has the authority and responsibility for implementing the non-training performance deficiency(ies) solution(s) and provides the recommendation to that office or agency. The recommended solution should be comprehensive and complete, or it may only provide a partial solution.

3-13. Needs analysis documentation

a. After identifying training and education needs (whole or partial), the needs analysis team documents the specific learning products and components required to implement the solution. This documentation includes identifying the product's name and number (See table 3-6 to determine if a specific product exists), specifying what to accomplish, and determining the processes to employ or revise.

Table 3-6
Learning product search procedure

Step	Actions
1	<p>Select sources. Consult all possible sources to determine which are appropriate. Most proponent libraries have research librarians who can assist. Below are some possible sources.</p> <ul style="list-style-type: none"> • Existing course materials • Instructors/facilitators and TNGDEVs of previous versions of the course • External and internal evaluation reports of previous versions of the course, such as learner evaluations • Central Army Registry (CAR) • Publications and personnel from other federal agencies, industry and commercial sources, and colleges and universities • Libraries, World Wide Web, and the Internet
2	<p>Identify possible learning products and the learning objective(s) they support. Ask the following questions:</p> <ul style="list-style-type: none"> • Do the learning products match the learning objective? • Is the content at the appropriate level of difficulty and complexity for the target audience? • Are the learning products accurate, current, and free of error? • Are the learning products copyrighted? • Do the learning products address motivational factors and encourage active learning? • Are the learning products well organized? • Are the learning products properly sequenced? • Will the learning products be meaningful and appealing to the learners? • Is the reading level appropriate? • Can the available learning products be used in part, be modified, or combined with other learning products to accomplish the desired goal? • Are the learning products cleared for international officer or contractor use?
3	<p>Evaluate and select initial learning products.</p> <ul style="list-style-type: none"> • If using copyrighted material, coordinate with the library to obtain permission from the publisher before using. Permission may involve a user fee. Determine if the fee is within the school's budget and if the material provides adequate benefit to justify the cost. Coordinate with the servicing OSJA, as required. • If the learning product being evaluated for possible use is labeled "limited to U.S. learners only," "no foreign," or "no contractors," or if it is unclassified information from a classified source, its use must be cleared with the local security office. Coordinate to clear all learning products (including unclassified material) through local security office before distribution.
4	<ul style="list-style-type: none"> • Document the research. Be sure to include classification, FD, and copyright information for any existing products selected. Coordinate with the servicing OSJA, as required.

b. The specific requirement could involve simply modifying a lesson or course, or it may involve conducting or revising a job analysis, updating an ICTL and/or revising the individual critical task analysis, and/or redesigning a course. These requirements form the basis for determining development workload. Having requirements for training or education does not ensure the procurement of resources for development. The needs analysis team conducts the following actions to complete the documentation and ensure the team has the basis for any refinement of a TED requirement:

(1) Submits workload requirements for approval to the proponent's approval authority prior to proceeding beyond the needs analysis.

(2) Provides the approved requirement(s) documentation to the appropriate proponent responsible for the training or education solution.

c. The proponent, in coordination with the team evaluator, retains a copy of the needs analysis documentation to verify any TED/training or education requirements and for future reference. See the Needs Analysis Checklist JA on the TED website for additional information on needs analysis.

3-14. Establish training and education development/training or education requirement

The TED/training or education requirement forms the basis for accomplishing the proponent's TED workload. After identification and approval of a training/education or partial training/education solution to a performance deficiency, the commander/commandant or their designated representative establishes the specific TED requirement(s) to achieve.

a. The proponent commander/commandant's designated representative(s), with needs analysis evaluator support, identifies and documents the TED training and education requirement. The proponent determines the actual products and materials to create or update to implement the approved training/education or partial training/education solution to the performance deficiency. This includes identifying the name and number of the product (if it exists), specifying what to accomplish, and the processes to employ or modify. The specific requirement could involve simply modifying a lesson, or it may involve conducting a job analysis, updating individual tasks analyses, and redesigning a course.

b. The commander/commandant's designated representative provides the approved TED requirement to the proponent agency responsible for the products and materials that need to be updated or created to implement the approved training/partial training solution to the performance deficiency.

3-15. Improve education/training efficiency and effectiveness

A commonly overlooked aspect of needs analysis is the continuing requirement to improve development and implementation of education and training. The proponent remains constantly alert to identify means of improving the training efficiency and cost effectiveness due to new/improved training or TED technologies, processes, procedures, or TED management techniques. Technology, process application, procedures, and education/training/TED

management techniques have the capability to improve education/training efficiency and effectiveness when applied to education/training.

3-16. Needs analysis quality control

To maintain the quality of the needs analysis products, it is essential to apply QC procedures continuously. All TNGDEVs involved in the conduct of the needs analysis exercise QC over the process and products produced. The proponent conducts a thorough, efficient, and effective needs analysis. The proponent, with team evaluator input, keeps appropriate leaders and managers apprised of needs analysis status and provides assurance that the needs analysis outputs are valid.

3-17. Learning product analysis process overview

The ADDIE process is applicable to individual learning products. The ADDIE process begins when a needs analysis identifies a performance gap or deficiency due to a lack of knowledge, skills or attitudes, where training, education, or a combined solution will meet the identified need. If a needs analysis indicates a need for a new learning requirement, such as the creation of a new MOS or ASI, the next step is to perform a job analysis and generate a TTI for that job, or function. If a needs analysis indicates a requirement to modify an existing learning product or program, the ADDIE process is used. The intent is that each analysis phase results in a product, and each product goes through its own iteration of ADDIE. The various sub-processes and products constitute the Army's instructional design system when taken as a whole. (See chapter 4 for a discussion on job analysis.)

3-18. Mission analysis for learning product development

Mission analysis is conducted in response to a needs analysis or a change of a unit's mission, capabilities, tasks, performance requirements, equipment, and/or personnel. (See TP 350-70-1 for additional information on mission analysis.)

a. Mission analysis establishes unit/organization missions and identifies those collective tasks required for mission accomplishment. The outcome of mission analysis is the UTL. The proponent commander and/or commandant, or designated representative, approves the UTL. UTLs serve to increase Army readiness and mission accomplishment.

b. TNGDEVs use the UTL and job analysis information to identify individual tasks that are critical to accomplishing a collective task. This aspect of analysis informs the nomination of individual tasks for consideration and designation as an individual critical task, placement on the ICTL, and subsequent learning product development or maintenance. A mission analysis includes the following steps:

- (1) Identify the specific type unit to analyze.
- (2) Conduct detailed unit research.
- (3) Conduct additional research.
- (4) Identify the unit mission.

(5) Identify type unit capabilities and functions.

(6) Identify the collective tasks for the UTL.

(7) Assign collective task numbers to critical collective tasks.

(8) Identify supporting individual tasks.

(9) Identify supported UJTL/AUTL tasks.

(10) Identify and document any safety hazards the unit may encounter when performing the mission and collective tasks.

(11) Identify and document all environmental factors the unit may encounter while performing the mission and collective tasks.

3-19. Safety, risk management, and environmental protection

a. This section provides guidance for including safety, risk management, and environmental protection in training development products.

(1) TNGDEVs and trainers must design and develop training and education products to support learning plans that enable leaders to enhance safety by integrating and conducting risk management. Leaders must be able to identify and manage/mitigate risk while providing realistic mission training and exercises that prepare Soldiers and units to win in a decisive action training environment.

(2) Risk management is the process of identifying, assessing, and controlling risks arising from operational factors and making decisions that balance risk costs with mission benefits (Joint Publication 3-0). Institutions will manage risks without degrading essential learning requirements. Rigorous, realistic learning exercises implemented under stressful conditions are critical to preparing Soldiers to fight and win in military operations.

(3) TNGDEVs and trainers must plan, initiate, and carry out actions and programs in a manner that minimizes adverse effects on the environment. (See AR 200-1 and Army Techniques Publication (ATP) 3-34.5 for more information on environmental responsibilities.)

b. TR 350-70 provides specific safety/risk management responsibilities of trainers and TNGDEVs, writers, and contractors assigned to training development or curriculum development roles. The proponent for risk management integration into Army training is the TRADOC Safety Office.

(1) Safety/risk management, environmental protection, and compliance are the responsibilities of commanders, commandants, managers, and individuals. Primary references for safety information are found in ATP 5-19, DD Form 2977 (Deliberate Risk Assessment

Worksheet), TR 385-2, and DA Pam 385-30. The primary references for environmental-related risk information are located in ATP 3-34.5.

(2) TRADOC training proponents, TNGDEVs, trainers, and other subordinate personnel must design, develop, and implement realistic, viable training that accomplishes the following conditions:

- (a) Negates risk to lives and equipment.
- (b) Eliminates or minimizes the risks involved in relation to the training benefits.
- (c) Employs controls to eliminate/reduce risks/hazards.
- (d) Prevents, eliminates, or minimizes environmental damage through personal or military action.
- (e) Conserves and preserves resources.
- (f) Complies with federal, state, and local environmental laws, regulations, and restrictions (for example, endangered species protection; oil and hazardous waste disposal).

(3) TRADOC training proponents, TNGDEVs, trainers, and other subordinate personnel must also integrate safety, risk management, and environmental protection considerations into training and training materials (see TR 385-2). Specifically, the proponent conducts the following actions:

- (a) Include appropriate safety/risk/environmental protection statements, cautions, notes, and warnings in all training products.
- (b) Identify the risk and assign a risk assessment code to every proponent lesson (resident and nonresident/DL).
- (c) Coordinate with and obtain approval from the appropriate branch safety manager for lesson plans and other training products that have safety and risk management issues, except training conducted wholly in a classroom environment and with a residual risk level of “low.”
- (d) Following approval from the senior commanding general officer in the chain of command, forward a copy of the acceptance letter of extremely high residual risk assessments to Commander, U.S. Army Training and Doctrine Command, 950 Jefferson Avenue (ATCS-S), Fort Eustis, VA 23604-5700 or via email at usarmy.jble.tradoc.mbx.hq-tradoc-g-1-4-safety-office@mail.mil.
- (e) Foster safe training and environmental protection by recognizing unsafe behavior and attitudes, making risk-related decisions, properly counseling individuals, and developing countermeasures to control, mitigate, or eliminate hazards during training.

- (f) Participate on the environmental QC committee in accordance with AR 200-1.
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Chapter 4

Job Analysis

4-1. Job analysis introduction

Proponents perform job analysis to determine what the jobholder must know or do on the job. The job analysis objectively identifies individual tasks performed by job incumbents for each job analyzed. Job analysis is the process used to identify individual critical tasks to be trained/taught in order for jobholders to accomplish their duties. Job analysis also provides information about what knowledge, skills or attitudes need to be trained or learned, under what conditions they are performed and used, as well as the standard of performance that needs to be achieved. For training development and training purposes, a job is a MOS by branch code and skill level; officer AOC by rank and/or functional area; warrant officer and enlisted MOS by ASI; SQI; SI; language identifier code; or other special category. Special categories include but are not limited to common tasks (for a specific skill level), additional duty assignments, and civilian jobs which the Army is required to train. A minimum essential requirement before the development of individual learning products is to conduct a job analysis on all new and existing jobs in the Army. The outcome of a job analysis is to identify the knowledge, skills, attitudes, duties and responsibilities, education, and/or experience required for the jobs (skill levels), as well as the criticality of each task, to determine what the jobholder should know or do on the job. Job analysis outputs are the TTI and, if applicable, an enumeration of knowledge, skills and attitudes required in order to do the job. Additional products produced are the field survey data, and individual task performance data. The CTSSB output is a recommended ICTL, and the CTSSB produces task selection model data.

4-2. Job analysis process

a. Proponents conduct a job analysis whenever mission and collective task analysis, needs analysis, MOS consolidation, changes in weapons systems, new equipment requirements, technology updates, or other sources indicate major changes have occurred in the structure or content of the job or skill. A proponent may conduct a job analysis as part of its maintenance cycle to ensure operational performance requirements and institutional learning requirements are current. Proponents perform a job analysis on all new and existing jobs (MOS/AOC) or skills (ASIs) that are under their proponents. The first output of the job analysis process is the TTI. The job analysis team develops the TTI for a specific job or skill, and the CTSSB uses the TTI to create an ICTL for command approval. The ICTL identifies all the individual critical tasks for a specific job or duty position to include task titles and task numbers. During the CTSSB process, the board selects the initial training or education site. This ensures individual training and education that supports the accomplishment of unit wartime missions, METLs, and the full range of military operations.

b. When the CTSSB process identifies the individual critical tasks and the training proponent commandant/commander approves them, the job analysis process is complete. The job analysis team maintains all CTSSB documents to include the audit trail for tasks not selected for the

ICTL. (See figure 4-1 which depicts the process and activities involved in conducting the job analysis process.) A job analysis checklist is available on the TED-T website.

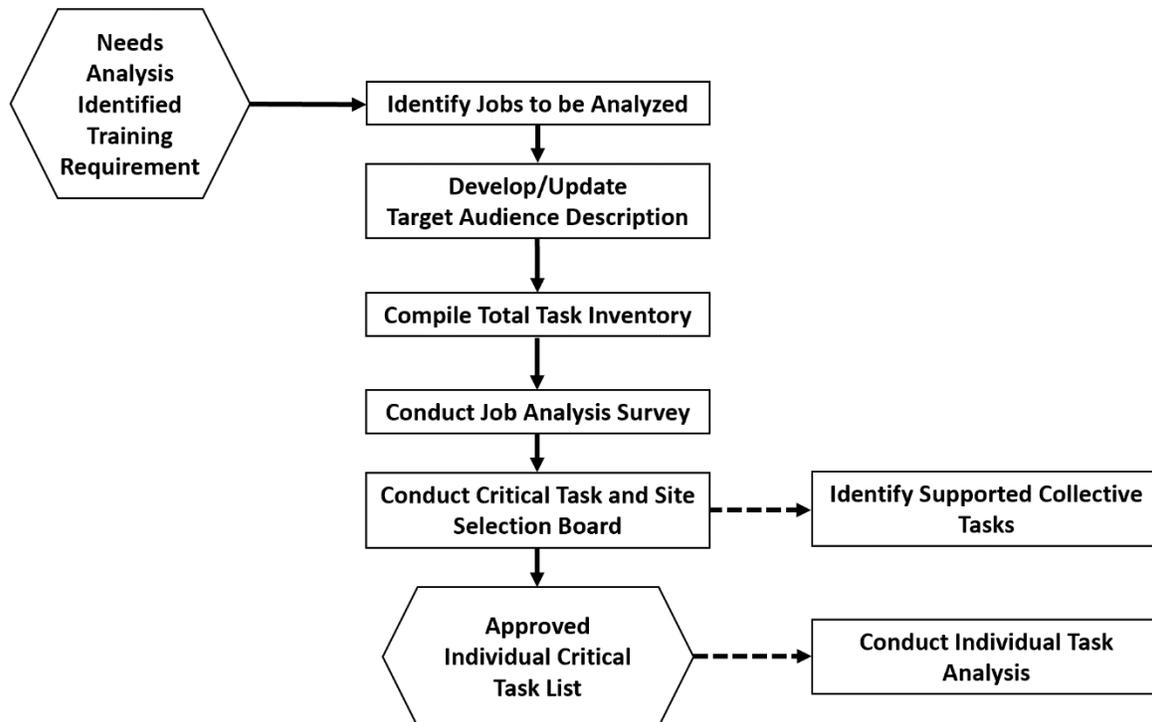


Figure 4-1. Job analysis process

c. The job analysis team identifies valid individual critical tasks for a specific job or identifies a group of critical tasks, such as for an entire MOS/AOC. (See table 4-1 for the typical roles and duties for job analysis team members.)

d. The job analysis team should collect and document the following information:

(1) The expectation of what and how the job incumbent will perform once training is complete.

(2) The circumstances or conditions in which the job incumbent performs the job.

(3) The tools the job incumbent will have to facilitate performance of the job.

(4) How to judge the job incumbent as having successfully completed the job.

(5) The prerequisite knowledge, skills, and attitudes that a job incumbent must have prior to starting tasks associated with the job.

(6) The knowledge, skills, and attitude requirements that must be taught for the successful accomplishment of the job which may also be derived during an individual task analysis.

Table 4-1
Job analysis team members

Regular members	Duties
<p>Training development manager: The training development manager has the overall management responsibility to ensure the analysis team conducts a thorough, efficient, and effective job analysis and identifies valid critical tasks as well as the knowledge, skills, and attitudes necessary for the successful accomplishment of the job.</p>	<ul style="list-style-type: none"> • Establish and select the analysis team. • Issue/explain the job analysis mission and process to the team. • Prepare/update the job analysis project management plan. • Ensure the team accomplishes their work efficiently and effectively and produces quality results. • Keep command informed on job analysis status. • Support the conduct of the CTSSB. • Provide assurance to the command that the analysis outputs are valid.
<p>TNGDEV: The TNGDEV is the job analysis SME and provides job analysis guidance to the SMEs.</p>	<ul style="list-style-type: none"> • Prepare all documentation required to conduct the job analysis. • Train the SMEs in writing tasks and knowledge, skill, or attitude elements, if applicable. • Establish the critical task selection criteria. • Present a briefing explaining the job analysis project. • Construct, administer, and analyze job analysis surveys. • Establish, select, and organize the CTSSB. • Obtain command approval of the critical tasks. • Ensure the quality of the application of the job analysis process and the products produced.
<p>SMEs: SMEs come from both RA and RC and have three major roles in the conduct of a job analysis. Different individuals normally fulfill these roles, but in a few rare instances, the same SMEs may perform all three roles.</p>	<ul style="list-style-type: none"> • Identify all tasks (critical learning requirements) and associated knowledge, skills and attitudes (learning elements) that are performed to accomplish the job/duty position. • Provide input to the job analysis survey. • Serve as a voting member or chair of the CTSSB, provided the SME comes from a unit performing the tasks and has an understanding of the knowledge, skills and attitudes needed to execute the job being reviewed. • Ensure the quality of the technical (subject matter) content of the job analysis products.

Table 4-1
Job analysis team members, cont.

<p>Commander/commandant: The commander/ commandant is the approving authority for individual critical tasks.</p>	<ul style="list-style-type: none"> • Approve and sign the document identifying the critical tasks for the job/jobs being analyzed.
<p>Evaluator: The evaluator serves as an independent observer, providing QA/QC of the process and work.</p>	<ul style="list-style-type: none"> • Determine if team members properly conducted job analysis and make comments/recommendations, as appropriate, to the team and the commander/commandant. • Ensure the surveyed target audience included appropriate representation from the RA and RC. • Ensure the CTSSB included appropriate representation from the RA and RC. • Serve as a nonvoting member of the CTSSB.

e. The job analysis team should follow the process listed below when conducting their work. The level of detail will vary, depending whether the team conducts a new job analysis, or the team updates an existing ICTL.

(1) Identify/select the job to analyze.

(2) Develop/update the target audience description.

(3) Conduct job familiarization/research.

(4) Compile the TTI.

(5) Conduct the job analysis survey (collect task performance data).

(6) Identify the associated knowledge, skills and attitudes (learning elements) that are performed to accomplish the job/duty position.

(7) Conduct CTSSB (nominate individual critical tasks).

(8) Advise the board on educational analysis and procedural matters.

(9) Obtain ICTL approval.

(10) Distribute the approved ICTL.

(11) Prepare the list of the task that the CTSSB did not recommend as critical task.

(12) Update the task list based on individual task findings.

4-3. Identify/select job to analyze

Starting points for new and revised job analysis are as follows:

a. New. Proponents must conduct a new job analysis when a needs analysis identifies a requirement to create a new job, merge or consolidate jobs, realign a career field, or divide a job into two or more jobs. New/updated mission or collective analysis data, new/updated contractor-produced analysis data, a new job initiated by reorganization or consolidation, evaluation feedback, and other sources of data also trigger common learning requirements. The associated product/project manager provides new individual tasks associated with new materiel systems to support the job and individual task analysis processes (to include software-enabled tasks). (See TP 350-70-13 for specific guidance on TED for new systems).

b. Revision. Proponents must conduct a job analysis revision when there are major changes in the job and the tasks performed as part of the job. Major changes may be a result of unit feedback, new doctrine, new or improved systems/equipment, evaluation feedback, and/or lessons learned.

4-4. Individual task identification

The matrix in table 4-2 shows an example of how to identify tasks during job analysis. When complete, the matrix will depict all tasks required to perform a job.

Table 4-2
Sample task identification chart

Task	Jobs		
	88M1O	88M2O	88M3O
pppp-xxx-nnn1		X	
pppp-xxx-nnn2	X	X	X
pppp-xxx-nnn3			X
pppp-xxx-nnn4	X	X	
pppp-xxx-nnn5		X	
Key: pppp* (proponent code) – xxx (task type) – nnnn (unique number assigned by proponent)			
*Proponent code can be three or four digits.			

4-5. Develop/update target audience description

Upon receipt of an approved requirement to conduct a job analysis, the target audience description is developed/updated by the job analysis team. In this instance, the job incumbents make up the target audience. (See chapter 5 for target audience analysis procedures.)

a. The target audience description characterizes the jobholders—the individuals that perform all the tasks associated with the specific job analyzed. It identifies the number and qualifications of the personnel that operate, maintain, and support a system of equipment. It describes the range of individual qualification and all relevant physical, mental, physiological, biographical, and motivational dimensions.

b. In the target audience description, the job analysis team should be as comprehensive as possible to describe jobholders from across the ability spectrum. This information will assist in the collection of data when compiling the TTI and assist in the education/training design process. The job analysis team identifies the following information in the target audience description:

(1) Skill and knowledge level. A skill is the ability to perform a job-related activity, which contributes to the effective performance of a task performance step. Knowledge is information or facts required to perform skills or supported tasks. The level of skills and knowledge directly influences whether a jobholder can perform the specified work. Skills and knowledge can be derived from a job analysis but are more likely to be derived from an individual task analysis.

(2) Attitude. Attitude is a way of thinking about a person, place, thing or event and the behavior displayed that reflects the Soldier's and DA Civilian's way of thinking. Attitude can affect whether a jobholder wants to perform specified work.

(3) Reading grade level. The job analysis team uses information from the target audience analysis to establish the average reading grade level for the job incumbents.

(4) Previous training received. This is the determination of what previous education/training the average job incumbent received. An understanding of previous and/or prerequisite training received provides further insight into a jobholder's level of understanding and expertise needed to perform the mission.

(5) Math skill level. This establishes the minimal math skill a job incumbent must possess to perform the job. Some occupations require more quantitative (numeric-based) knowledge and skill than others do, hence the need for a minimum math skill level requirement. See chapter 12 for definition of quantitative. Having knowledge of what the average job incumbent possesses at the next lowest skill level is valuable for designing follow-on education/training.

(6) ASVAB scores required for the job. This test evaluates and measures a Soldier's skill and vocational aptitude. The test scores are compared to the skill levels required for a job to determine qualifications, as well as strengths and weaknesses for peer alignment. Data are quantitative.

(7) Time in grade/service. This is an indicator of depth of experience and knowledge learned as well as a key indicator that the learner has potential to be a contributor for team and group learning. Data are quantitative.

(8) Time in duty position. This is an indirect indicator of a learner's/jobholder's ability to master multiple tasks to standard in a job or position over a specified period. It indicates depth of knowledge for the position correlated to time in position. Data are quantitative.

(9) Civilian education level. The level of civilian education is an indicator of cognitive and/or psychomotor learning ability and desire to complete a course of study. Data are quantitative.

(10) Job history. This identifies where the learner or jobholder is along his/her career continuum. The analyst identifies what jobs a learner has had, how long he or she held each job, and what skills were required. Other information to consider is if the learner or jobholder completed a full preparation and application cycle in each job position, indicating willingness to learn, master, and complete subject material and job duties to a specified standard. Data can be quantitative or qualitative.

(11) Workplace conditions. These are the expected working conditions in which the learner/jobholder studies course material or performs the job. It includes an assessment of the mental demands and physical conditions that exist in the workplace. This information indicates if the learner/jobholder has the resources to engage in learning activities to do the job. Data are quantitative.

(12) Demographics. This information identifies additional characteristics of the target audience, such as gender, age, ethnicity, size of the population, and location of the population. Data are quantitative. This is part of the Target Audience Analysis. This information is gathered using a survey, whose participation is optional, and anonymous.

(13) Computer literacy level. This is the establishment of the minimal computer skills a learner must possess to achieve the learning objective, or a jobholder must possess to perform the job. Some learning objectives or occupations require more computer software knowledge and digital skills than other occupations. Data are quantitative and qualitative.

(14) Maturity. This is a psychosocial element based on observation and experience. Maturity is a subjective measurement of how close a learner/jobholder is to full development of the capability to learn and master the course material and achieve the course objectives. Age is not the only indicator of maturity. Data are qualitative.

(15) Motivation to learn. This indicates the level to which the learner/jobholder wishes to attend the course or wishes to attend, learn, and master the course material and meet the course objectives. The analysis identifies whether course attendance is voluntary or mandatory. Data are qualitative.

(16) Interests. This indicates whether a learner's stated interests may be complementary with course subject matter and objectives or a job's critical tasks. Data are quantitative and qualitative.

4-6. Conduct job familiarization/research

The job analysis team learns as much as possible about the job/duty position in order to determine the tasks required for job performance. The job analysis team researches all available resources to determine the tasks of a job. Research includes locating and studying literature, viewing equipment, and interviewing knowledgeable people. To study required literature, the team identifies, collects, and studies all available information to analyze a job/duty position. To review equipment, the team analyzes equipment the job incumbent used, maintained, or repaired. After this preliminary information gathering, the job analysis team should compile the TTI.

4-7. Compile total task inventory

a. List of tasks. A TTI is a complete list of tasks associated with a job at each skill level. Steps to identify tasks in a TTI include conducting a job familiarization, interviewing SMEs, and extracting tasks from references, mission analysis, and collective task analysis. Figure 4-2 lists some possible references to use for gathering tasks to compile the TTI. After conducting a job familiarization and identifying tasks from SME interviews, the job analysis team compiles the actual inventory. There is no decision made concerning whether or not the task is critical; the inventory simply lists all tasks the incumbent may perform on the job or while serving in the duty position that the job analysis covers. The job analysis team provides as much task detail as needed to make tasks clear to the operational field (survey) and CTSSB members, because the CTSSB members vote using the spreadsheet data. The TTI is the starting point when conducting a CTSSB meeting. A TTI revision should be a relatively rare occurrence, because the job analysis team keeps this list current.

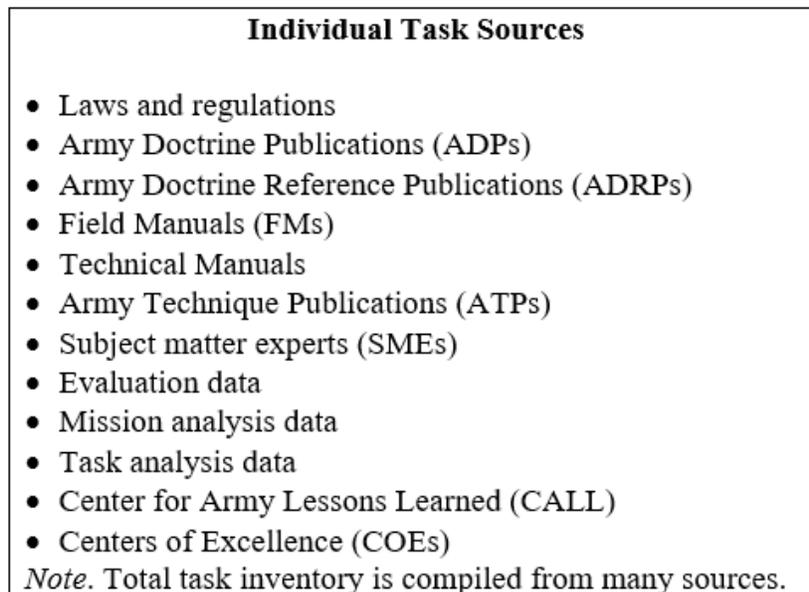


Figure 4-2. References for compiling a total task inventory

b. Task title. On the TTI, only task titles written to the task title standard per TR 350-70 should be listed. See a lists of common verbs titled Standard Verbs for Task Titles that conform to the task title criteria on the TED-T website.

c. Task identification number. The job analysis team enters each task into a spreadsheet and assigns a unique, four-digit, temporary identification number (not a critical task number) to each task. These numbers identify each task item on the survey and provide the capability to track and associate collected task performance data. A reason that may not be apparent for use of identification numbers is the subliminal effect of using a critical task number on the survey and on the individuals building the TTI. If survey takers see a task with a critical task number listed, they may assume the task is critical and mark the survey accordingly, thus giving undetectable, invalid input. With nondescript numbers assigned, the survey takers do not readily make the

assumption the survey data collected have increased validity. The temporary identification numbers make it easier to locate the tasks on the spreadsheet.

d. SME interviews. When conducting interviews, the job analysis team conducts a detailed review of all available information prior to performing the interview, in an effort to frame questions. The interviews may be performed via electronic media (video teleconference or internet), telephonically, or in person if resources allow. The job analysis team should include these possible sources of information and obtain job performance data from the following individuals that are currently, or have recently, served in the job or duty analyzed:

- (1) RA and RC Soldiers.
- (2) DA Civilian job incumbents.
- (3) Job incumbent supervisors.

e. SME input. SMEs are crucial to the compilation of the TTI. A SME is an individual who has a thorough knowledge of a job, to include the duties and the tasks of the job. This knowledge makes the SME a vital participant in the analysis process as it relates to consultation, review, and providing an extensive understanding of all primary and associated functions of that job. The level of knowledge and expertise possessed determines whether a SME is a journeyman or at a master level. When making task selection decisions, if master-level SMEs are not available, the job analysis team should seek out SMEs with the highest level of expertise.

4-8. Conduct job analysis survey

Individual tasks are considered critical tasks when the individual must perform them to accomplish their mission and duties and to survive in the full range of Army operations. Conducting a job analysis survey and collecting task performance data from actual task performers provides an objective means for determining the critical tasks individuals perform in jobs and duty positions across the Army. The job analysis survey may also identify knowledge, skills or attitudes that are required in order for individuals to perform the job. Knowledge, skills and attitudes must begin with a verb. These knowledge, skills and attitudes may become the basis for TLOs that are taught in courses with educational outcomes. Selecting critical tasks is a judgment process that requires guidance criteria.

a. Establish the criteria for critical task selection. The first step in conducting the job analysis survey is for a proponent to establish the criteria used to help make this vital decision. The criteria essentially dictate what data are collected and which task selection models are used. A critical task selection model is selected to apply statistically valid task selection data to identify individual critical tasks. A task selection model is a conceptual model in which statistically valid task selection criteria identify individual tasks critical to the performance of a specific job. Various task selection models are available. They require deliberate decisions to customize and/or to meet user needs. Proper use of any task selection model requires training on each specific model in order to select and adapt the one that best suits the proponent and supported operational needs. The TED-T website provides best practices for using the different task selection models. Some examples of task selection models are the following:

(1) The Difficulty-Importance-Frequency (DIF) Model is a three stage-sorting model that evaluates each task in each area of task performance difficulty, importance, and frequency. Tasks are sorted by difficulty (sometimes by yes/no, sometimes by low, medium, and high). Next, the tasks are sorted by importance (very, moderate, and not important categories). Finally, each task is sorted by frequency (frequent, moderate, and infrequent). How those tasks are branched through the three filters results in the prioritization of the tasks for training as high, moderate, low, and none. (See figure 4-3 for an example of the DIF Model.)

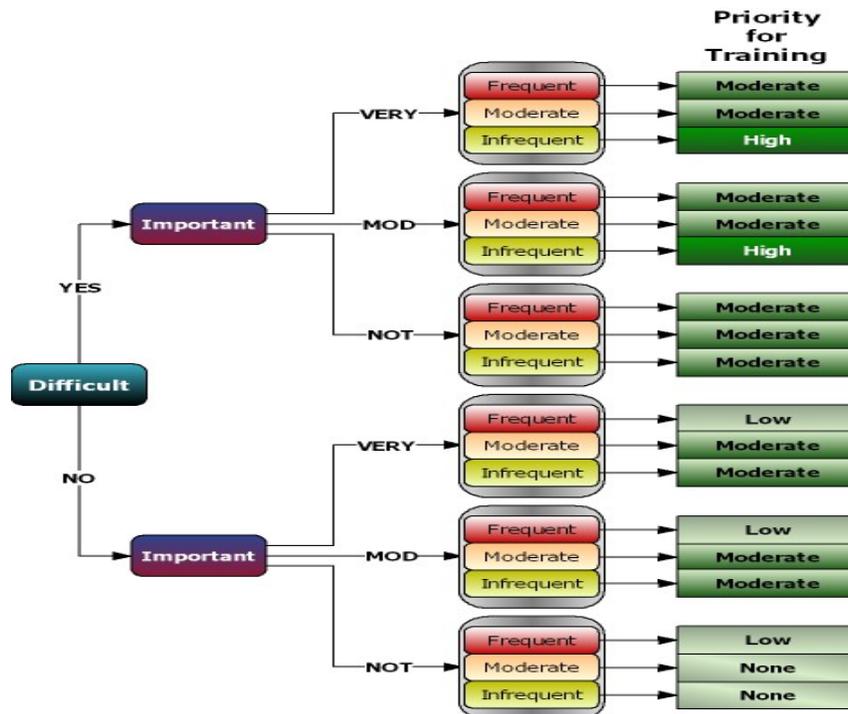


Figure 4-3. Difficulty-Importance-Frequency Model

(2) The Criticality-Difficulty-Frequency (CDF) Model is a three-stage model that evaluates each task in each area of criticality, difficulty, and frequency. Tasks are sorted by difficulty of performance into low, average, and high. Then each task is sorted by criticality of performance into yes or no. Finally, each task is sorted by frequency of performance into low, average, and high. Based on how those tasks are branched through the three filters, the results classify the tasks as no training, training, or over training. (See figure 4-4 for an example of the CDF model).

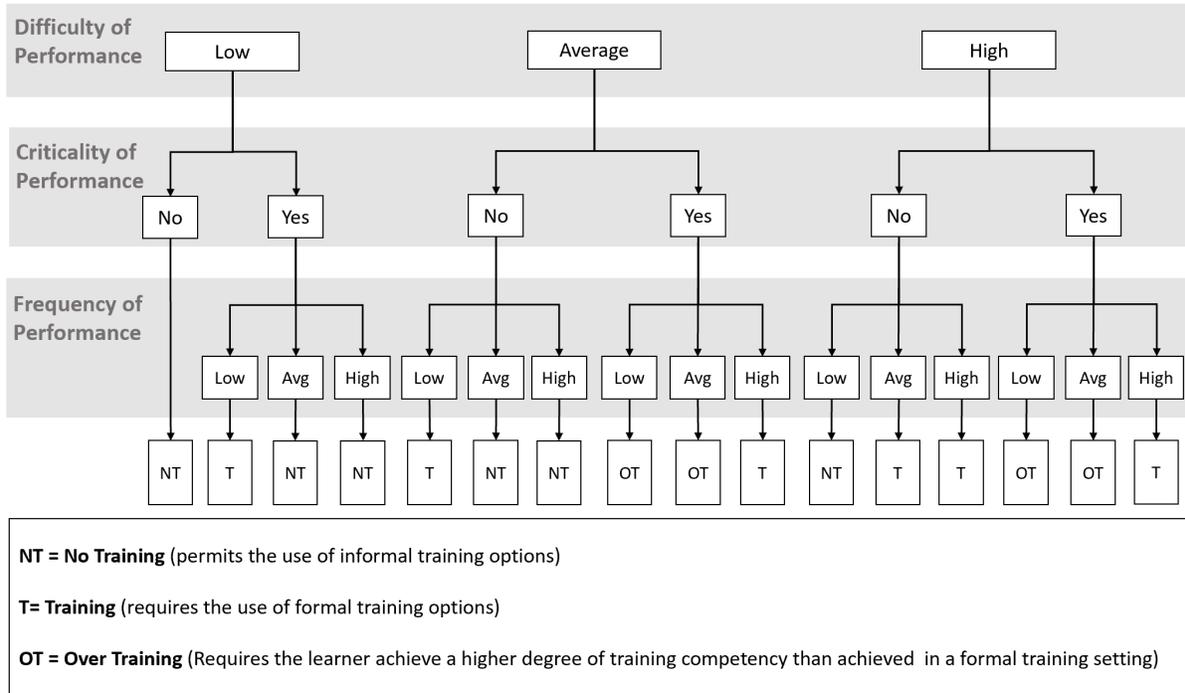


Figure 4-4. Criticality-Difficulty-Frequency Model

(3) The All Critical Learning Model is similar to a decision matrix in that both the matrix and the All Critical Learning Model use selection factors/criteria and both allow for weighting of said factors/criteria. A decision matrix is used during the course of action comparison step of the military decision making process (MDMP) to determine which course of action best solves the problem based on the selection criteria. The All Critical Learning Model is used to evaluate each task item for the following factors: immediacy of performance, safety hazard severity, criticality of performance, frequency of performance, probability of performance, difficulty of performance, task delay tolerance, percent performing, and percent of time spent performing. Each factor has a definition and scale (which may change with different proponents and respective jobs). The values are totaled to yield a data-supported scale of criticality of tasks. (See figure 4-5 for an example of an All Critical Learning Model.)

		Selection Criteria									
		Final Rating	% of Time Spent Performing (I)	Percent Performing (H)	Task Delay Tolerance (G)	Difficulty of Performance (F)	Probability of Performance (E)	Frequency of Performance (D)	Criticality of Performance (C)	Safety Hazard Severity (B)	Immediacy of Performance (A)
Task Number											
Task 1											
Task 2											
Task 3											

Figure 4-5. All Critical Learning Model

(4) The Four-Factor Model relies on four variables to evaluate each task. Two of the variables are percent performance and task learning difficulty, and the proponent determines the other two variables. Typically, it is a mathematical model and the resultant value provides the basis of the criticality in relation to the other tasks evaluated in the four variables. The mathematical equation varies dependent on the task selection variables used. The Four-Factor Model begins like other models, with values assigned in each factor for every task prior to calculation. There are no current examples of this model as each one is unique.

(5) The Training Emphasis Model is a selection model that uses a training emphasis factor to determine if a task is critical or not. Supervisors and/or jobholders provide a rating on a sliding scale as described in the survey (generally 1 to 10, with 10 being most critical and 1 being not critical at all). The survey usually consists of a few questions, which are designed specifically to contribute to the common training emphasis score. The survey results (totaled or averaged) are converted to a training emphasis score (see figure 4-6). Next, the proponent selects values to identify which training tasks need further discussion to refine their priority. Those tasks above the top value (nn = probably is a critical task) are automatically included as critical tasks and those below the selected bottom value (n = probably not a critical task) are automatically removed (see figure 4-7). Tasks located between the top value (nn) and the bottom value (n) are discussed at the CTSSB review.

Task Item:	Task title	TE Total
50	Supervise Camouflaging of Fighting Positions	4.09
35	Review Unit Standing Operating Procedure (SOP)	4.09
167	Administer First Aid for Heat Injuries	4.09
570	Report Enemy Information	4.07
96	Report Unit Status	4.07
37	Supervise Unit Key Control Procedures	4.07
	(items omitted)	
859	Maintain a M4 Carbine	3.14
320	Install M18A1 Antipersonnel Mines	3.12
120	React to an Approaching Noncommissioned Officer (NCO)	3.12
	(items omitted)	
53	Bury Remains (After Receiving Authorization)	2.39
9	Distribute Mail in the Field	2.29
14	Formulate Input for a Unit Historical Report	1.89
	(items omitted)	
278	Conduct Equipment Replacement Operations	0.00
279	Conduct Personnel Replacement Operations	0.00
280	Conduct Service Station Resupply	0.00
281	Conduct Supply Operations	0.00

Figure 4-6. Example of task list with training emphasis score

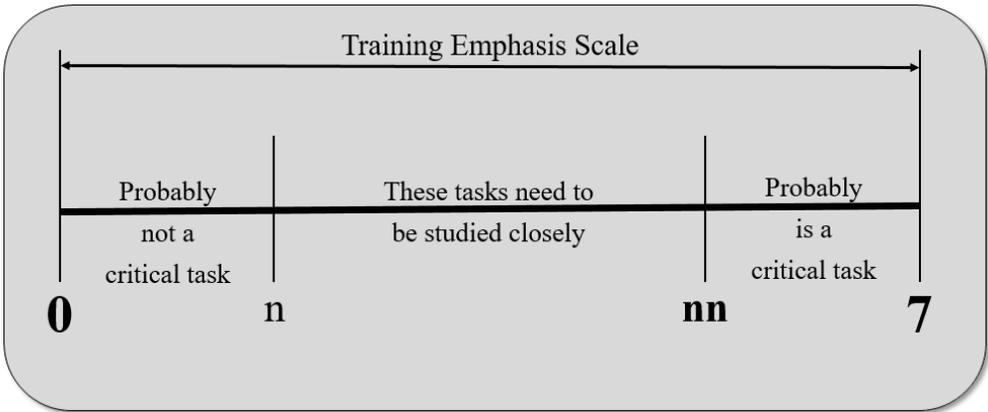


Figure 4-7. Example of training emphasis scale

(6) The Current, Similar, Subtask Model is a three-phase decision tree to filter tasks into critical tasks and non-critical tasks. Proponents further analyze and develop tasks to integrate the tasks into existing training. Current, Similar, Subtask models require the task hierarchy to be complete before each task is assessed. The task hierarchy can be included as part of a survey or as guiding questions performed by task selection board members.

b. Plan the job analysis survey. The job analysis survey plan identifies the following elements:

(1) Those responsible for constructing the survey, conducting the survey (proponent or contractor), taking the survey, and analyzing the results.

(2) The method of conducting the survey, to include how the surveys are distributed (online versus in person), how the surveys are returned, and how the returned data are consolidated.

(3) The optimum survey site(s), where the team can gather the most representative data identifying what the jobholder's job/duty position entails. Sites selected should represent a cross-section of the specified jobholders in the RA and RC units, helping to ensure accurate representation and analysis. Multiple sites provide a better cross-section of information, leading to increased data validity.

c. Select the type of survey to conduct. The job analysis team determines which type of survey to conduct. Survey types are described below:

(1) Field survey. This is a school- or agency-prepared survey conducted to collect task performance data to identify critical tasks. Field surveys assist in validating task lists and/or obtaining additional data for job and task analysis. U.S. Army Research Institute (ARI) approves the survey and assigns a survey control number. Survey leads are encouraged to contact ARI to confirm whether a review and license is required for their survey. The 360-degree survey is an example of a field survey.

(2) Local survey. This is a school- or agency-prepared and -conducted survey. This type of survey may need a license number depending on the type and number of participants.

d. Identify and comply with survey requirements. COEs/schools that use survey instruments and that propose to collect information from Army personnel will follow the requirements and processes for survey approval, licensing, and tracking in accordance with Department of Defense Instruction (DODI) 8910.01 and AR 25-98.

(1) Consult the U.S. Army Records Management and Declassification Agency Army Internal Clearance Office and the information management control officer (IMCO) of jurisdiction for information management control submission requirements resulting in the DA Form 7799 (Request for Approval of Information Management Requirement).

(2) Surveys will meet three separate requirements: approval or exemption from a licensing authority, Army sponsorship, and approval or exemption from the U.S. Army Records Management and Declassification Agency Army Internal Clearance Office.

(3) The job analysis team will coordinate and submit requirements in accordance with AR 25-98.

(4) COEs/schools will maintain a current listing of all data collections and provide this information to Army and/or Department of Defense (DOD) upon request, regardless of whether IMCO/ARI review or licensure is required.

e. Construct the job analysis survey. Constructing a job analysis survey is a critical part of the process. The purpose is to collect statistically valid data on tasks a jobholder performs in order to determine which tasks are critical to Army readiness. This information helps determine whether a task is critical to a job. The job analysis survey is a relatively simple survey that requires the respondent to answer questions only directly related to performance of the tasks listed in the TTI for the job surveyed; any other questions would distract from the purpose of the job analysis survey. Survey administration instructions are crucial to the respondents knowing what they are to do. Survey administration instructions should be concise, clear, and easy to understand, since a person is not there to clarify any information. Point of contact (POC) information should be provided in case the respondent has any questions. The survey should indicate confidentiality/anonymity of information so that respondents understand their responses are not attributable to them.

f. Conduct the job analysis survey. A job analysis survey is key to the identification of individual critical tasks and knowledge, skills or attitudes. First, the job analysis team decides how the job analysis survey will be administered if a field or local survey is conducted. Task performance data are collected from RA and RC Soldiers in operational/field units for a specific job or for an entire MOS/AOC. In many cases, a budget will dictate how to conduct the survey. Administering a survey involves distributing the survey (mailing, email, or website), conducting interviews, collecting the completed surveys, and managing the process. It is critical that all respondents to surveys are treated fairly and equally.

g. Compile the job analysis survey data. A critical step in the job analysis process is analyzing the job analysis survey data and preparing reports that management and especially members of the CTSSB can readily decipher. The analyst performs the following tasks:

- (1) Reviews all task survey data received (both field and local survey results).
- (2) Compiles and consolidates task survey data obtained from the surveys.
- (3) Calculates and analyzes the job analysis survey data and determines the validity of the data.
- (4) Prepares an updated TTI for members of the CTSSB by:
 - (a) Organizing the survey results to provide clear, concise guidance and information, well in advance of the CTSSB review. For example, group tasks initially by subject area so that all related tasks are together. Otherwise, the CTSSB members would have to sort through the entire list of tasks in the TTI to see if all of the required tasks for that subject area are there. Grouping tasks like this significantly reduces the time the board must actually meet.

(b) Dividing the results into three major groupings to expedite the work of the CTSSB. The three major groups are: (1) probably not a critical task, (2) should be studied closely, and (3) probably is a critical task.

(c) Annotating the TTI with the source of the task (existing TDC task list, new equipment or doctrine, recommended addition by SME).

(d) Annotating the TTI with the percent performing the task.

(5) Prepares a list of tasks the survey respondents suggested. The board must consider these tasks.

(6) Prepares documentation explaining data collection and achievement of validity. For example, the 2020 U.S. Army Sergeants Major Academy (USASMA) common task survey collected data from over 19,000 RA and RC Soldiers.”

(7) Prepares a crosswalk between supported collective and individual tasks. This is optional, depending on whether the board requires clarification.

4-9. Conduct a critical task and site selection board

A CTSSB meeting is a management device that serves a QC function in the selection of critical tasks. The board—composed mainly of SMEs—reviews the TTI, field survey data, and job performance data; recommends tasks for approval, revision, or deletion; assigns a criticality rating to each task; and recommends an initial training location. The CTSSB recommends additions, changes, and deletions to the TTI. The CTSSB members determine the critical tasks for their MOS based upon their expertise and the job analysis survey data. Table 4-3 lists typical CTSSB membership roles and duties. Proponents that teach inter-service lessons must include a SME on a CTSSB that addresses the AUTL- and UJTL-supported tasks. Proponents develop the list of individual critical tasks, including inter-service tasks for each branch/MOS. Ensure that all CTSSBs meetings comply with the requirements addressed in AR 1-50, paras 1-8 and 1-9.

Table 4-3
Critical task and site selection board members

Regular members	Duties
Chair/president (Is a SME. Casts tie breaking vote only)	<ul style="list-style-type: none"> • Convenes the individual board. • Ensures adequate RA and RC representation. • Selects board members (approximately 5 to 7 SMEs). • Leads the discussions on critical task selection. • Advises board on procedural matters.
Commander/ commandant	<ul style="list-style-type: none"> • Receives the ICTL, other documentation (TTI, list of tasks rejected by the board, minutes), and approval memorandum. • Approves, adds, or deletes tasks from the ICTL. • Signs the memo signifying approval of critical tasks. •
TNGDEVs (non-voting members)	<ul style="list-style-type: none"> • Coordinate/prepare site. • Advise board on educational, analysis, and procedural matters, to include the following matters: <ul style="list-style-type: none"> ○ Learning product development process. ○ Job analysis. ○ Individual task analysis definitions for an individual critical task, task performance data, and task selection models. ○ A list of current doctrinal references in relationship to individual task and task performance data. • Ensure inter-service tasks are included in institutional training and education as appropriate.
SMEs (voting members, except inter-service personnel)	<ul style="list-style-type: none"> • Possess at least one skill level higher than the job for the recommended tasks. • Recommend changes, such as rewording, combining, additions, or deletions of tasks, to the TTI. • Provide technical information and advice to the board on task content. • Determine criticality of each task based on the task selection model. • Recommend each task as critical or non-critical. • Recommend new tasks, as appropriate. • Make initial recommendations where to teach the task (OISD training domain), and the frequency of instruction. This includes making initial recommendations as to whether the task is a viable candidate for DL. The SMEs must inform the CTSSB of any task not appropriate for DL. • Recommend task conditions, equipment required to complete the task, performance steps and measures, task evaluation methods/techniques, and safety and environmental concerns/considerations.

**Table 4-3
Critical task and site selection board members, cont.**

Regular members	Duties
Recorder/ administrative assistant (non-voting member)	<ul style="list-style-type: none"> • Records voting and discussion comments. • Prepares minutes of the meeting and distributes results to Commandant/Commander’s office and quality assurance office (QAO). • Prepares memorandum for Commandant/Commander’s signature. • Archives all CTSSB documentation in accordance with AR 25-400-2.
Evaluator (non-voting member)	<ul style="list-style-type: none"> • Ensures recommendation of tasks as critical/non-critical based on an appropriate task selection model. • Ensures task title meets the regulation requirements (see TP 350-70-1 for task title requirements).
RC representative(s) (voting member(s))	<ul style="list-style-type: none"> • Ensures RC requirements are included in the decision. • Functions as a SME.
Industry representative(s) (optional, non- voting member(s))	<ul style="list-style-type: none"> • Aids in certification and credentialing efforts for Soldiers to align the job with industry. To ensure that there isn’t any improper influence or the appearance of influence, have such proposed activity first be reviewed by the servicing OSJA to ensure this participation complies with law and policy.

a. Plan for the CTSSB. Proponents plan for the CTSSB by completing the following actions:

- (1) Project the dates for the CTSSB in the appropriate submission timeline.
- (2) Develop the draft HQDA Execution Order/Tasking Order for the CTSSB. Staff through U.S. Army Forces Command to send out the tasking to units for CTSSB members.
- (3) Prepare the draft operations order for the conduct of the CTSSB.
- (4) Determine the cost estimate/budget for the CTSSB.
- (5) Conduct an initial meeting to review the process and identify key personnel.
- (6) Develop a milestone chart for the CTSSB.
- (7) Conduct the initial in-progress review.

b. Prepare for the CTSSB. The efficiency achieved in the conduct of the CTSSB directly relates to the effort and quality of the preparation. The difference between the board being brief/short and efficient, or time-consuming and work intensive, is the result of advance

preparation and organization of the board proceedings. The following steps describe an efficient way to prepare for a CTSSB:

(1) Prepare the job analysis survey results.

(2) Select board members (see table 4-3 for CTSSB members). Voting members come from RA and RC units out of both the operational (preferred) and generating forces.

(3) Prepare the administrative documents for the CTSSB (such as agenda, board assignment letters, welcome packets, read ahead materials).

(4) Provide a board guidance SOP to the members.

(5) Coordinate resources for conducting the CTSSB (such as site, billets/lodging, and temporary duty (TDY) funds).

c. Prepare the job analysis survey results. When available, use automated analysis to present the task survey data to the board members so they can understand the data quickly. This minimizes the amount of studying the members have to accomplish while the board is in actual attendance and can save hours of time.

d. Select board members. It is important to assemble the board with master performers of the tasks under consideration, as their recommendations determine whether the tasks are critical. The following process assists in creating a robust board membership:

(1) Select board members from across the RA and RC units in which job incumbents serve.

(2) Select board members that are at least one rank/pay grade higher than the job incumbents are.

(3) Use Soldiers from operational units as the primary choice.

(4) Use instructors as a last resort. Experience shows instructors want to teach the task. This skews the board results.

(5) Create a document to capture information on personnel nominated to be members of the CTSSB.

(6) Create a scoring rubric to rate CTSSB member nominees and select the most qualified applicants.

e. Prepare the board assignment letters. Each board member receives a memorandum signed by the proponent commandant or other appropriate official. This memorandum emphasizes the importance of the board, and contains the following information and instructions:

- (1) Assigns individuals to the board and explains their duties.
- (2) Provides guidance and identifies responsibilities for board members.
- (3) Identifies all board members and their duties to other board members.
- (4) Identifies dates, times, and location the board will convene and adjourn. An option is to hold the meeting via electronic means, such as a video teleconference.
- (5) Provides the annotated TTI documents.
- (6) Includes general instructions, such as the daily agenda, travel and lodging instructions (if applicable), a map or driving directions, and the prescribed uniform for members.

f. Provide a board guidance SOP. A board functions more efficiently if it establishes a set of rules and procedures at the onset and follows those rules and procedures. The proponent responsible for conducting the CTSSB or similar synchronization meeting prepares and distributes a board guidance SOP that addresses board composition, preparation procedures, team actions prior to the board meeting, onsite board procedures (voting procedures), and post-board actions.

g. Coordinate/acquire site. The proponent acquires the use of a location or facility to hold the CTSSB meetings. The following factors should be considered when selecting a site:

- (1) A location convenient to conduct the board.
- (2) A room large enough to hold all the required attendees at the same time.
- (3) Availability of facilities, bachelor officer/enlisted quarters, dining facilities, and restrooms.
- (4) Technological support, computers, large screens, and/or a video projector.
- (5) Administrative support.

h. Prepare for the CTSSB. Prior to the CTSSB, the proponent should complete the following tasks:

- (1) Review existing tasks and annotate all issues for discussion during the CTSSB meeting.
- (2) Set up meetings with doctrine writers, combat developers, and/or new equipment personnel to ensure they are aware of all impending changes, so they can incorporate the changes into the CTSSB and individual task revisions.

(3) If the proponent has a DL team, discuss with them which tasks are good candidates for selection to DL.

(4) Interview associated course instructors to determine if they have identified any issues with tasks or the task list.

(5) Review the information in chapter 5 that describes the target audience to ensure board members have a clear understanding of its makeup.

(6) Ensure all individual tasks are available for review during the CTSSB meeting. Frequently, the title alone will not be enough to allow board members to decide on an issue. The board may require a review of the task to determine whether to change the title or if the task is critical.

(7) Meet with board chairman/president to discuss operating procedures for the CTSSB.

(8) Identify a guest speaker to provide a short introduction on the importance of the CTSSB. The guest speaker can also brief the CTSSB members on imminent changes to ensure all board members are aware before making decisions that require this knowledge.

(9) Prepare strip maps to assist in finding the CTSSB site.

(10) Conduct final in-progress review.

i. Conduct the CTSSB. The conduct of a CTSSB involves more than just conducting a meeting. There are steps to take to speed up the process, as well as to help obtain valid results. Many of these steps occur before the board meets, but there are actions all members can do during the meeting to improve efficiency, as follows.

(1) The chairperson/president convenes and adjourns the meeting on time. The chairperson/president calls for a vote by voting members on each task. The chairperson/president leads discussion and debate, when necessary. The chairperson/president limits discussion to time available.

(2) The TNGDEV explains the TTI at the start of the first meeting.

(3) Board members (RA and RC SMEs) concentrate on issues. They provide appropriate, definitive comments. They vote on each task listed. They prepare votes in advance of the meeting and bring the votes to expedite the process. They nominate new tasks that are missing from the TTI before or at the board meeting. They recommend changes to task titles and/or task content. They assign a rating to each task. Finally, the board members recommend an initial training location for each task.

(4) The recorder, administrative assistant, or other designated individual maintains notes concerning board decisions, discussion notes concerning areas of potential contention, and documentation of required follow-up actions, and also prepares CTSSB meeting minutes.

(5) The evaluator attends all meetings to confirm the board follows a procedure to ensure that valid individual critical task nominations will result from the board's actions.

4-10. Obtain individual critical task list approval

Individual critical tasks are extremely important to the Army's overall readiness and mission accomplishment. An individual critical task is a task that a Soldier and/or DA Civilian performs to accomplish their mission and duties, and to survive in battle and during other military operations. Therefore, the proponent commander or commandant approves all individual critical tasks. The TNGDEV prepares the approval memorandum and attachments for signature, and distributes the approved lists, as appropriate. Prior to seeking approval, the TNGDEV prepares the ICTL so the approval authority may easily discern what they are reviewing for approval. In addition, the TNGDEV and/or recorder prepares other documents for record, to include the following items.

- a. A list of tasks the CTSSB recommended for approval as critical tasks. The TNGDEV should consider grouping the tasks by categories to increase the coherence of the list. Additionally, he/she will forward the list to the commander/commandant for approval.
- b. A list of tasks the CTSSB did not recommend as critical tasks. The TNGDEV will forward the list to the commander/commandant as a reference.
- c. The minutes taken during the CTSSB meeting. The TNGDEV/recorder will capture the reason(s) for any controversial issues or decisions and record issues that may surface as potential problems in the future.
- d. Prepare a memorandum for the commander/commandant's signature that addresses the task list the CTSSB recommended for approval as individual critical tasks. It will also include appropriate guidance for conducting the follow-on individual task analysis. The commander/commandant's signature signifies approval of the individual critical tasks memorandum.

4-11. Individual critical task list

An ICTL is the list of individual critical tasks that job incumbents must perform to accomplish their mission and duties. Each proponent's CTSSB selects critical tasks from the TTI identified during job analysis to develop the ICTL. The ICTL includes information that directs in which OISD training domain to teach or learn the individual task, the task's skill level, and the task's frequency of instruction. The ICTL also includes individual tasks linked to one or more collective tasks. The proponent conducts a review of ICTLs every three years to ensure that the critical tasks are relevant to the force. Steps to prepare the ICTL are as follows:

- a. Conduct a CTSSB. A CTSSB is a synchronization meeting. Other synchronization meetings include the course design review (CDR) and post-instructional conferences (PICs). Appendix C provides details on ways to conduct synchronization meetings. It is not necessary to reconvene a CTSSB for minor changes to the ICTL (for example, rewording or combining individual tasks). Ensure that all PICs comply with the requirements addressed in AR 1-50, paras 1-8 and 1-9.

b. Provide new or deleted task recommendations to the approving authority with justification for major changes or updates to the ICTL.

c. Enter the approved ICTL into TDC, including links for the frequency and training location. In TDC, a TNGDEV can create a new ICTL from scratch or from a template. The TDC Electronic Performance Support System (EPSS) provides systematic instructions for both methods of creating a new ICTL. (See figure D-1 for an example ICTL with institutional and supporting products.)

d. Provide the complete recommended ICTL to the proponent commandant/commander for approval. Include a copy of the recommendations and justification for major changes or updates to the ICTL, as requested.

e. Modify and obtain approval of a revised ICTL from the approving authority and distribute the revision when the follow-on task analysis determines, for example, that a task is in fact two tasks, the approved critical task is not a task, or a task is missing.

f. Post approved ICTLs to the CAR, which supports Total Army Learning Enterprise requirements where the centers/schools link or load all approved and validated products and grant access to their material to include DL products.

4-12. Distribute approved critical task list

Once the commander/commandant approves the ICTL, the TNGDEV or designated board support personnel distribute the list to all leaders and organizations responsible for the conduct of individual task analysis. Distribution actions include the following steps:

a. Provide a copy of the approved critical individual tasks to the organization responsible for the conduct of the individual task analysis.

b. Provide a copy to the collective training analysis office or equivalent.

c. Notify offices responsible for producing training materials and products based on the ICTL of its approval.

d. Provide a copy to the proponent's office for update of applicable AR 611-series publications on Personnel Selection and Classification.

e. Coordinate with the training and education proponent for task analysis data and Soldier training publications (STPs). An STP is a training publication that contains individual critical tasks and other information used to train all Army Soldiers to the same standard. STPs provide guidance on the conduct of individual Soldier training in the unit and aid all Soldiers in the training of individual critical tasks. The proponent commander/commandant has discretionary authority whether or not to prepare and publish an STP. (See TP 350-70-1 for more information on STPs.)

4-13. Job analysis quality control

To maintain the quality of the job analysis products, it is essential to apply QC procedures continuously when applying the job analysis process. A Job Analysis Checklist JA is available on the TED-T website.

4-14. Individual task analysis

A TNGDEV performs an individual task analysis to determine the job performance requirements of each task performed on the job. Job performance requirements include task title, conditions, standard, performance steps and performance measures, administrative instructions, and references. Job performance requirements define the measures used in diagnosing individual performance and evaluation of instruction. Individual task analysis provides the detail to design and develop individual learning products and support collective training. An Individual Task Analysis Checklist JA is available on the TED-T website.

a. The approved ICTL is the starting point for analyzing each individual critical task to derive detailed performance data. The data are translated into learning objectives driving the design and development of necessary learning products.

b. Individual task analysis identifies how to perform the task correctly, under what conditions to perform the task on the job, and how well the individual must perform the task. The individual task analysis process provides a breakdown of the performance steps and performance measures, knowledge, skills, attitudes, and activities that constitute the individual task. Current, complete, and comprehensive individual task analysis is essential as it provides the detail needed to design and develop individual learning products. It is the responsibility of the proponent TNGDEV to keep individual task analysis data current including information concerning knowledge, skills and attitudes.

c. The TNGDEV performs analysis and identification of knowledge, skills, and attitudes in coordination with course managers and SMEs. This is the critical, detailed analysis step or activity that ensures the learner possesses the requisite knowledge, skills, and attitudes needed to perform the task. If not, there will be a need to develop the learner's attributes or abilities. The TNGDEV identifies knowledge, skills, and attitudes early in the analysis phase, and addresses environmental considerations, and safety considerations with each task performance step. Knowledge, skills, and attitudes must also have a description or standard and a doctrinal or regulatory reference.

(1) A skill is one's ability to perform a job-related activity that contributes to the effective performance of a step or learning activity. The three types of skills are physical (psychomotor), mental (cognitive), and emotional (affective). A skill description consists of an action verb and a direct object.

(2) Knowledge is job-related information analyzed to provide meaning, value, and understanding to perform skills, activities, or job functions. Knowledge is comprehension gained by deliberate, systematic, sustained effort through study, experience, practice, and human interaction that provides the basis for expertise and skilled judgment. A knowledge description consists of a verb and a direct object. Classifying knowledge into four different types can assist

the TNGDEV in articulating effective learning objectives. The following are the four types of knowledge:

- (a) Factual knowledge (terminology, specific details, and elements).
 - (b) Conceptual knowledge (classifications, categories, principles, generalizations, theories, models, and structures).
 - (c) Procedural knowledge (subject-specific skills and algorithms, subject-specific techniques and methods, and criteria for determining when to use appropriate procedures).
 - (d) Metacognitive knowledge (strategic knowledge, knowledge about cognitive tasks including appropriate contextual and conditional knowledge, and self-knowledge).
- (3) An attitude is a way of thinking about a person, place, thing or event and the behavior displayed that reflects the Soldier's and Army Civilian's way of thinking and is largely defined through affective learning.

4-15. Individual critical task list-to-lesson crosswalk

When developing a new lesson, the TNGDEV identifies the individual critical tasks that need to be taught. TNGDEVs should use the ICTL-to-lesson-crosswalk in figure D-1 to ensure all individual critical tasks are in a lesson. TNGDEVs often use the ICTL-to-lesson crosswalk for functional courses. Chapter 7 describes lesson design and development.

4-16. Terminal learning objective supporting educational outcome-to-lesson crosswalk

TNGDEVs should use the TLO-to-lesson crosswalk sample in appendix D, figure D-2 to ensure all of the ELOs from TLOs, in courses with approved educational outcomes at the course/module level, are in a lesson. (See chapter 7 for lesson design and development.) (See table 4-4 for goal analysis procedures.)

Table 4-4
Goal analysis procedures

Step	Action
1	Write down the commandant/commander-approved broadly stated course outcomes or educational outcomes. This is the goal (desired result) of the course, module, or lesson.
2	Classify the goal into a learning domain (cognitive, affective, or psychomotor). Paragraph 7-3.d. describes each learning domain.
3	Determine the level of learning required to achieve the goal. Figure 7-1 learning levels for the Revised Bloom's Cognitive Domain
4	Write down the performances that, if observed, demonstrate achievement of the goal. Do this without regard for duplication or abstract language.
5	Sort out the list. Delete duplications and unwanted items. Retain the items stated in terms of performance. Revise the remaining items, stating them in terms of performance.
6	Write a complete statement for each performance, describing the nature, quality, or amount of performance considered acceptable. Each statement includes a verb that describes observable behavior. The verb should be appropriate for the learning level of the goal. Each statement should have an observable outcome.
7	Sequence the performance statements to describe step-by-step exactly what learners are doing when they perform the goal. A method to accomplish this is to map the performances in a diagram.
8	Validate the performance statements and sequence. Does the achievement or demonstration of each of these performance statements in the recommended sequence achieve the goal? Revise the performance statements and/or sequence, as necessary, to achieve a yes answer to the question.

Chapter 5

Target and Targeted Audience Analysis

5-1. Target and targeted audience analysis introduction

a. The target audience must be defined before learning product development can begin. Target audience analysis identifies and describes the individuals (learners/jobholders) who perform all the requirements associated with the specific job or function analyzed or taught. Additionally, targeted audience analysis is used to identify the skills, knowledge, experiences, and attitudes of learners who are currently or will be attending a learning event.

b. Target audience analysis produces various data depending on the nature and scope of the analysis. Analysts use this data to create or modify the target audience description. The target audience description describes the range of individual qualifications, and all relevant physical, mental, physiological, biographical, and motivational dimensions. Additionally, a target audience description for a job analysis identifies the number and qualifications of personnel that operate,

maintain, and support a system or equipment. Analysts should be as comprehensive as possible when describing the target audience and include jobholders from across the ability spectrum. This information will assist in the collection of data when compiling the TTI, as well as assist in the design process. For the target audience description information, the analyst identifies and selects from the 16 elements described below. Each element is selected based on the element's application to the potential target audience. The information gathering tools are proponent schools, surveys, questionnaires, interviews, and may even include pre-selection exams.

c. Triggering circumstances are events or decisions that initiate follow-on actions. A job analysis acts as the triggering circumstance for a target audience analysis to identify and verify the target audience.

(1) Job history. This identifies where the learner or jobholder is along his/her career continuum. The analyst identifies what jobs a learner has had, how long he or she held each job, and what skills were required. Other information to consider is if the learner or jobholder completed a full preparation and application cycle in each job position, indicating willingness to learn, master, and complete subject material and job duties to a specified standard. Data are quantitative and qualitative.

(2) Skill and knowledge level. The level of skills and knowledge directly affects whether a learner can achieve the learning objective or jobholder can perform the specified work. Data are quantitative and qualitative.

(3) Attitude. Attitude can affect whether a learner wants to achieve the learning objective or the jobholder wants to perform the specified work. Data are qualitative.

(4) Reading grade level. This is the establishment of the average reading grade level for the learners or jobholders. It is an indicator of a level of vocabulary mastery, writing, and learning ability. Data are quantitative.

(5) Previous training received. This is the determination of what previous training/education the average learner or jobholder received. An understanding of previous and/or prerequisite training received provides further insight into a learner's/jobholder's level of understanding, and expertise required to perform the mission. Data are quantitative.

(6) Math skill level. This is the establishment of the minimal math skill a learner must possess to achieve the learning objective, or a jobholder must possess to perform the job. Some learning objectives or occupations require more quantitative (numerical-based) knowledge and skills than others do, hence the desire for a math skill level description. Having knowledge of what the average learner or jobholder possesses at the next lowest skill level is valuable for designing follow-on education/training. Data are quantitative.

(7) ASVAB scores required for the job. This test evaluates and measures a Soldier's skill and vocational aptitude. The test scores are compared to the skills levels required for a job to

determine qualifications, as well as strengths and weaknesses for peer alignment. Data are quantitative.

(8) Civilian education level. The level of civilian education is an indicator of cognitive and/or psychomotor learning ability and desire to complete a course of study. Data are quantitative.

(9) Time in grade/service. This is an indicator of depth of experience and knowledge learned as well as a key indicator that the learner has potential to be a contributor for team and group learning. Data are quantitative.

(10) Time in duty position. This is an indirect indicator of a learner's/jobholder's ability to master multiple tasks to standard in a job or position over a specified period. It indicates depth of knowledge for the position correlated to time in position. Data are quantitative.

(11) Workplace conditions. These are the expected working conditions in which the learner/jobholder studies course material or performs the job. It includes an assessment of the mental demands and physical conditions that exist in the workplace. This information indicates if the learner/jobholder has the resources to engage in learning activities to do the job. Data are quantitative.

(12) Demographics. This information identifies additional characteristics of the target audience such as gender, age, ethnicity, size of the population, and location of the population. Data are quantitative.

(13) Computer literacy level. This is the establishment of the minimal computer skills a learner must possess to achieve the learning objective, or a jobholder must possess to perform the job. Some learning objectives or occupations require more computer software knowledge and digital skills than other occupations. Data are quantitative and qualitative.

(14) Maturity. This is a psychosocial element based on observation and experience. Maturity is a subjective measurement of how close a learner/jobholder is to full development of the capability to learn and master the course material and achieve the course objectives. Age is not the only indicator of maturity. Data are qualitative.

(15) Motivation to learn. This indicates the level to which the learner/jobholder wishes to attend the course or wishes to attend, learn, and master the course material and meet the course objectives. The analysis identifies whether course attendance is voluntary or mandatory. Data are qualitative.

(16) Interests. This indicates whether a learner's stated interests may be complementary with course subject matter and objectives or a job's critical tasks. Data are quantitative and qualitative.

d. Instructors/facilitators and jobholders at the next higher skill level should review the existing target audience description to determine the scope of the analysis. The description may

be accurate as is or may only need minor revision. The remainder of this chapter addresses two types of pre-assessment analysis (targeted audience analysis) The chapter then focuses on conducting a new target audience analysis, and what to do if there are major changes in an existing target audience analysis. The target audience description is used when determining the learning product's content, length of instruction, needed equipment/materials, MOIs, instructional strategies, and media. Target audience analysis should consider the ALM to ensure compliance with the latest guidance.

5-2. Targeted audience analysis for learners enrolled in a learning event

The targeted audience analysis focuses on the learners about to be enrolled in a learning event or course nearing implementation. The targeted audience is the selected student body about to be enrolled in the event or course (as opposed to the demographic as a whole). The targeted audience analysis is not an alternative form of target audience analysis. This targeted audience analysis is used when it is critical to identify the skills, knowledge, experiences, and attitudes of the learners scheduled for or in attendance at a learning event to understand learner strengths, weaknesses, and breadth of experiences. For example, the targeted audience analysis results may facilitate placement of learners into small groups or seminar groups or may identify potential leadership structure of a class. The triggering circumstance for initiation of a targeted audience analysis is anticipated new learner arrivals. During an event or course, verification of learner expectations can initiate a targeted audience analysis. This analysis may not need to use all 16 elements identified during the more comprehensive target audience analysis. The targeted audience analysis facilitates collection of data to shape course presentation and identify potential learner leaders. The targeted audience analysis may be supported by data obtained through a pre-assessment of knowledge, skills, and attitudes. The following two types of pre-assessments for targeted audience analysis may be used:

- a. One type of pre-assessment determines whether learners possess the knowledge, skills, and attitudes required to learn the course's objectives successfully. This pre-assessment addresses the prerequisite knowledge, skills, and attitudes required for entry into the course, but not the learning objectives of the course.
- b. A second type of pre-assessment assists the instructor to tailor training and the instructor's approach to training based on the learners' experiences and knowledge levels. This type of assessment may also allow the instructor to organize groups of learners more effectively by ensuring a capable peer coach is in each learning group or dividing a large number of learners into regular learner groups and accelerated learner groups.

5-3. Determine population size, location, and availability

School proponent offices supporting the tasks or learning objectives to analyze or teach know the population density of projected learners by MOS or required skill. They also know the units with those specific MOS or skill requirements, and this identifies the locations of the specific population. This information assists in determining effective sampling procedures and appropriate data collection methods. It also helps determine how to deliver the instruction. Several factors to consider are described below:

a. Population size. If the target audience is large, then development of DL may be sensible if the task can be trained using DL. However, if the target audience is small, then DL may not be cost effective.

b. Population location. If the target audience is widely dispersed, it may not be practical to bring learners to a central location for instruction. If this is the case, a resident course may not be the appropriate method.

c. Population availability. If workload requirements will not allow Soldiers to be away from the unit for long periods, it is not likely that a resident course will be appropriate.

d. Additional factors. Other considerations include but are not limited to population demographics, experience, and education level.

5-4. Data collection planning

Data collection is a systematic process for aggregating data in a logical sequence, so the developer can more effectively analyze the information. Data collection considerations include accuracy, validity, bias, stability, and relevance. Planning ensures that the sample size is sufficient to represent the population while also ensuring the appropriate use of resources. Planning improves the development team’s ability to create data collection instruments and to collect data. Target audience data collection goals and objectives are listed in figure 5-1.

<ul style="list-style-type: none"> • Briefly describe data collection project • Identify specific data required • Identify data sources • Interact with people knowledgeable of the target audience demographics • Select method to collect data (how and who) and include rationale • Identify method to analyze data • Identify historical data (if applicable) to compare with current and/or future collection 	<ul style="list-style-type: none"> • Define insights that data will provide • Define the collection timeframe • Define expected outcome of collection (how will data improve learning product development) • Identify method of reporting findings and recommendations
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Figure 5-1. Target audience data collection goals and objectives

5-5. Develop data collection instruments

a. Sampling. A sample is a representative segment of a target audience. The sample must be a true representation of the target audience population to ensure the data collected are accurate.

b. Sample size. It is essential to provide senior leadership with accurate data, and critical to assure leadership that the information collected represents the target audience. Sample size is determined by how many completed surveys, interviews, or observations are required to produce a reliable report. The following are some of the variables related to sample size calculation:

(1) Number of participants in the target audience: the percentage of participants needed for validity of results.

(2) Margin of error in the results: the acceptable margin of error.

(3) Results confidence level: the probability the survey results are representative of the population.

(4) The expected standard deviation of responses: level of variation expected in responses.

(5) Percentage of usable survey or interview responses or observations.

(6) Expected rate of return of responses.

c. Sample size determination procedure. Table 5-1 contains the sample size determination procedure. For additional information, see the Guidelines for Determining Sample Size JA on the TED-T website.

d. Sampling techniques. Relevant data are derived from multiple sources using the same collection method. Two commonly used sampling techniques are defined below:

(1) Simple random sampling. This sampling technique chooses each individual of a sample population by chance, and each member of the population has an equal chance of being included. The group of subjects (the sample) is selected from a larger group (the population).

Table 5-1
Sample size determination procedure

Step	Action
1	Use the information regarding the target audience in the data collection plan to ensure the clear identification of the target audience demographic.
2	Estimate how many individuals are in the demographic.
3	Select a confidence level that produces representative results.
4	Determine the estimated rate of usable surveys to use, the number of individuals/groups to interview, or the location and number of individuals to observe.
5	Determine the amount of data to collect and the number of evaluators required to collect it.

(2) Stratified random sampling. This sampling technique divides the population into categories (strata) and then collects data from the strata by simple random sampling. The basis for these categories is certain characteristics relevant to the survey (such as age, training and education level, grade, or gender).

e. Instrument design and development. Currently, available data collection instruments (surveys, interviews, observations, and forums) are reviewed to determine if they meet the project’s needs. If existing instruments are inadequate, instruments should be designed and

developed to meet the project's goals and objectives (such as questions and observation methods). Centers/schools may conduct occupational surveys, as well as attitudinal surveys, pertaining to training and education. See the Army Survey Request Instructions and Supporting Statement document on the TED-T website for more information.

f. Data collection items (questions). Data collection depends on properly designed and sequenced questions. Guidelines for question development are described below.

(1) Ensure questions are appropriate to the type of instrument, target audience demographic, and evaluation purpose. Questions may take varied forms but must remain relevant to the purpose of the evaluation.

(2) Design questions using a systematic, highly-defined approach to obtain consistent data for comparison, summarization, and, if the data are quantitative, subjection to statistical analysis. Consistently apply the following criteria because they can limit the instrument's validity if applied sporadically or inconsistently:

(a) Write questions in a way that does not bias respondents to show themselves in a favorable light.

(b) Design questions in a way that does not influence respondents to be unduly helpful by anticipating what the evaluator wants to hear or find out.

(c) Design questions in a way to minimize the chance that they ask for information which respondents are not certain, and perhaps not likely, to know, and give the option to say that they do not know.

g. Instrument validation. Instruments should be validated on a small scale and revised based on feedback, if necessary. However, if using existing measures, a pilot test would be more relevant.

5-6. Data collection

a. Data collection team actions:

(1) The team leader ensures team members follow a plan.

(2) The team leader ensures team members clearly comprehend the project's goals and objectives.

(3) The team collects data using the agreed-upon collection method and process.

b. Two technical approaches for collecting data are quantitative and qualitative. See chapter 12 for definition of qualitative. Table 5-2 depicts the differences between these two methods.

Table 5-2
Quantitative and qualitative data comparison

Quantitative data	Qualitative data
<ul style="list-style-type: none"> • Numerical values and measurements • Reliable and measurable 	<ul style="list-style-type: none"> • Associated with constructs such as cognitive behaviors, feelings, and perceptions • Concerned with descriptions • Data can be measured but sometimes are difficult to quantify

(1) Quantitative data. Quantitative data are numeric and require statistical interpretation to represent findings. They allow measurement of an amount (how much or how many) on a numeric scale. The most frequent use of this method is in observations, surveys, and interviews. Quantitative data express the results of measurements of a sample of an organization, group, or individual and normally are used as a basis to determine final courses of action for learning product development.

(2) Qualitative data. Qualitative data allow the assessment of concepts such as feelings, behaviors, and perceptions. Qualitative data collection methodology includes observations, interviews, and open-ended questions. Use of this method produces comprehension of behaviors, motivation, and/or reasons for actions to provide insight into a scenario or problem situation. The goal of qualitative data is a detailed description of the concept measured. Qualitative data are usually in the form of words, not numbers. Qualitative data either labels sampling units or places them into categories. In general terms, such data identified or named by some quality, category, or characteristic are nominal scales. Analysis of qualitative data often features the proportion that lies in a given category.

c. A third data collection approach, mixed methodology, may work best where the strengths of both quantitative and qualitative data could be beneficial.

d. Proponents should obtain data from appropriate sources and provide pertinent, reliable, and valid information. For target audience analysis, data sources include the target audience sample, supervisors of the target audience, the school proponent office, SMEs, and instructors/facilitators. (See table 5-3 for possible data sources.)

Table 5-3
Proponent list of possible data sources (not in particular order)

Joint Lessons Learned Information System/Center for Army Lessons Learned
Combat training center rotation feedback
Critical operations lessons learned collectors
Learning product evaluation reports
External evaluation reports
Instructor/facilitator feedback
Learner performance measurements and assessment results
SMEs
Learning product, doctrine, and capability developers
Observations
Interviews/focus groups
Conferences and seminars
Record reviews

5-7. Data analysis procedure

Analysts must know how to review, summarize, and analyze raw data as well as interpret the analysis results. (See table 5-4 which contains the data analysis procedure.)

Table 5-4
Data analysis procedure

Step	Action
1	Review data collection plan goals and objectives.
2	Determine reliability and validity of raw data.
3	Prepare analysis data. Summarize the data to avoid searching through individual responses. Count every reply.
4	Conduct data analysis and triangulation for qualitative data. Triangulation is a method used in qualitative research that involves crosschecking multiple data sources and collection procedures to evaluate the extent to which all evidence converges.
5	Interpret the analysis findings.

5-8. Review goals and objectives

To stay organized and focused, analysts should review goals and objectives for the data collection plan to put the data into perspective. This will help them categorize and compare results with the expected outcome.

5-9. Determine reliability and validity of raw data

Analysts ensure raw data are valid and reliable by conducting the following checks:

- a. Collect adequate data samples to ensure the validity and reliability of the findings. Sample size (per strata, if stratified) should be a predetermined goal established in the planning phase of the analysis.

b. Verify responses are consistent. Inconsistent responses may not invalidate the data unless the questions allowed for this. For example, examine responses about the same subject on the same instrument (the same question was asked in two different ways) to see if the same answer was obtained.

c. Look for indications that the participants did not answer the questions seriously. If a scale was used to rate a list of items, look for the social desirability effect (rating of all items positively) and central tendency (indiscriminate rating of items in the center of the scale). View these responses with caution.

d. Follow standardized procedures for collecting and recording data when using different analysts for interviews and observations. Ensure there are no systematic differences caused by those administering the survey.

e. Verify if responses were inappropriate, illegible, or confusing. To maintain data integrity, discard any irrelevant responses and those with discrepancies that cannot be resolved (that is, clean the data).

f. Check for the use of triangulation. This method, used in qualitative research, involves cross-checking multiple data sources and collection procedures to evaluate the extent to which all evidence converges. It can corroborate evidence from multiple sources of data and increase validity, especially for qualitative findings. There are three types of triangulations: investigator, theory, and methodological.

(1) Investigator triangulation involves using investigators in the analysis process. Each investigator examines the program with the same qualitative method (interview, observation, case study, or focus groups).

(2) Theory triangulation involves using more than one theoretical scheme in the interpretation of the phenomenon.

(3) Methodological triangulation involves using more than one option to gather data, such as interviews, observations, questionnaires, and documents.

g. Confirm if the analysts who did not conduct the observation interpret recorded notes differently than the analyst who did conduct the observation. This indicates faulty triangulation and the notes may be imprecise. View this data with caution.

h. Review the response rate. Low response rates can yield data that are not representative of the population.

i. Consider other factors that can affect data validity and reliability. Data reviewers must consider many factors in determining data are valid and reliable.

j. Check data for integrity. Unanswered questions could indicate the participant did not know the answer or refused to answer or that the question did not apply.

k. Consult a statistician or evaluator experienced in statistics when using unfamiliar analysis. Proponents or schools may have SOPs that include statistical measurement for the validity and reliability of data.

5-10. Prepare analysis data

Analysts condense the data for analysis by entering quantitative data into a statistical data analysis program and summarizing and condensing all qualitative data into categories. It may be difficult to summarize qualitative data accurately and effectively, which is why evaluators should continually review the data collection’s goals and objectives.

5-11. Analyze data

a. Data collected are qualitative data (expressed in narratives or words) or quantitative data (expressed in numbers). Table 5-5 provides guidance for analyzing both types of data.

Table 5-5
Qualitative and quantitative data analysis

Quantitative data	Qualitative data
<ul style="list-style-type: none"> • Make a copy of data and store master for historical use • Use copies for edits or revisions • Tabulate the raw data and measurements • Assemble data into rankings and ranges using statistical analysis 	<ul style="list-style-type: none"> • Examine all of the raw data • Organize comments into similar categories or themes including experiences, recommendations, outputs/outcomes, concerns, strengths, and weaknesses • Identify patterns, associations, and trends • Maintain records (for example, databases or spreadsheets) of this data for future reference
<p><i>Note.</i> Pay special attention to participants’ notes, comments, and answers to supplemental questions on surveys (or other data collection instruments). Develop additional questions if the results suggest the need for additional data.</p>	

b. Analyzing quantitative data requires statistical analysis. Statistical analysis involves the collection, analysis, interpretation, and presentation of data. There are two types of statistics, descriptive and inferential, as defined in the lists below. Not all types of statistics will need to be calculated for every survey. This Pam does not address how to use these methods; if the survey plan requires using unfamiliar statistical analysis methodologies, the TNGDEV should obtain the assistance of a more experienced analyst or statistician for guidance.

(1) Descriptive statistics are measurements that describe the data, including the following measures:

(a) Mean. This identifies the average value.

(b) Mode. This is the most common value.

(c) Median. This is the number separating the lower half from the higher half of a sample.

(d) Range. This identifies extreme values.

(e) Standard deviation. This identifies the degree of dispersion of values.

(2) Inferential statistics infer something about the total population from which the data were collected, usually through random sampling methods. They include the following analyses:

(a) Correlation. This statistical analysis is used to infer a relationship between two different populations based on data collected from a sample of each population.

(b) Chi-square. This statistical test compares observed or actual frequency with predicted or hypothesized frequencies.

(c) Analysis of variance. This statistical analysis determines whether there are any statistically significant differences between the means of two or more groups, one or more variables, or factors.

5-12. Interpret findings

Interpreting analysis is one of the most difficult parts of evaluation. To interpret findings, analysts perform the following actions:

a. Determine what the data reveal regarding the questions. Interpret the findings in common sense terms and be able to explain the results.

b. Identify trends. Annotate all trends and include them in the final report. (Qualitative data are often considered less objective than quantitative data. Despite the non-statistical nature of qualitative data, they can render more detailed, useful information.) Follow procedures developed by the proponent and outlined in the survey plan, especially when coding information, and look at themes and relationships at the case level.

c. Use appropriate statistical procedures or qualitative methodologies to interpret results. Obtain the assistance of a statistician or more experienced analyst when using unfamiliar quantitative or qualitative methods.

5-13. Gap analysis in relation to targeted audience analysis

Gap analysis compares the desired educational outcome with the learner's pre-instruction foundational knowledge determined by the targeted audience analysis. This analysis determines not only what to teach, but also how much to teach in a given lesson. Without this analysis, the TNGDEV risks producing a lesson that neither advances learning nor sustains learner interest in the learning experience or is beyond the learner's capability. The following is a technique for conducting gap analysis:

a. Analyze the targeted audience profile with respect to the educational outcome to provide the TNGDEV with an understanding of what the instructor needs to teach.

b. Refine the data from the previous step. The result of this analysis (what should they know and what do they already know) provides the information necessary to write the learning objectives addressed in the design phase.

c. Analyze the list of lessons with respect to the TLO. Determine if the lessons support the TLO, and if the lessons are critical for accomplishing the TLO.

Chapter 6

Course Design and Development

6-1. Course design and development introduction

a. A course is a complete series of instructional units (phases, modules, and/or lessons) identified by common title and number. A course contains critical learning requirements consisting of individual critical task and TLOs, along with elements of critical learning requirements, namely knowledge, skills and attitudes. Knowledge, skills and attitudes may be taught in courses that have educational outcomes for qualifying a jobholder for a specific Army job or function at a predetermined skill level or for career progression as specified in the proponent training strategy and the individual training plan (ITP). Examples of courses include those for IMT; award of an MOS; civilian intern programs; career progression, PME, or for a job function such as an ASI, SQI, LIC, and SI. Proponents document courses in TDC with a POI and course administrative data (CAD).

b. The course structure (phases, modules, and/or lessons) and supporting media emphasize the importance of articulating effective learning objectives that ensure alignment of training or education with critical learning requirements.

c. Course titles are specific and reflect the primary subject or purpose of the course. For example, an MOS-producing course title reflects the corresponding DA Pam 611-21 job title. A career progression course title reflects some association with the function or main subject taught by the course. The TDC POI course title and Army Training Requirements and Resources System (ATRRS) course title should match. ATRRS is the Army's database of record for all Army courses and houses course data by school, proponent, and fiscal year (FY). Use of the database maintains the integrity and currency of course data. TRADOC DCS G-3/5/7, Training Operations Management Activity (TOMA), assigns the course number based on numbering conventions outlined in DODI 1312.1-I.

d. The majority of course development work consists of changes to existing courses. Proponents will occasionally develop new courses in response to major DOTMLPF-P changes (such as a new MOS) or a training or education deficiency identified by the operational forces. Operational forces or civilian career program functional chiefs may also propose development of a course. New course development should begin no longer than three years prior to the implementation date. This is the minimum time required to develop the course materials and program, acquire the necessary resources, train cadre, and schedule facilities. However, a changing operational environment or training gap may require a more condensed timeline.

Courses that must be implemented within this compressed timeline require resource trade-offs that must be approved by the TRADOC DCS, G-3/5/7 (not applicable to non-TRADOC schools).

e. The Institutional Training Mission Management Tool (ITMMT), a module of ATRRS, is an integrated visualization tool that synchronizes training and resource management data from systems of record that support the institutional training and education enterprise. ITMMT interfaces with the TDC to capture and analyze the training resource requirements within the POI. ITMMT interfaces with resource management systems to provide visibility of resources in light of POI requirements, providing training developers, analysts, and managers the situational awareness necessary to make resource informed plans and decisions. Training developers can utilize the "What-If" analysis feature that enables users to explore changes in resource needs, given user-specified changes in training requirements.

6-2. Course design imperatives

a. Centers/schools will produce courses linked to and/or directly supporting critical learning requirements. Critical learning requirements justify the creation and management of Army learning products across the Learning Enterprise.

b. Centers/schools will produce courses with identified learning objectives and learner assessment criteria that support Army learning outcomes, and where possible, support credentialing, certification, and licensing requirements.

c. The applicable training and education proponent commandant/commander approves each course developed and/or reviewed/revised for implementation. Approval of a new course for development or an existing course for continued implementation constitutes an approval of each TLO associated with the course.

6-3. Course design considerations

a. Course design is flexible and allows centers/schools to incorporate instructional strategies and design methods that best achieve the learning outcomes for the course. In addition, flexibility in both course and curriculum design provide latitude for COE/school commandants and commanders to meet their training and education missions.

b. Course design translates analysis information into sequential, progressive instruction. Designing a course includes all aspects of planning and organizing what the course will look like, how the course will achieve the desired learning outcomes, and what materials and resources will be required to support course implementation. Design determines the purpose of the course, and then focuses on building a structure and sequence of lessons that best align learning objectives, learning assessments, instructional activities, and learning strategies with course outcomes. Course structure and lesson sequencing along with examples of course mapping, are discussed later in this chapter.

c. Course design may be based upon individual tasks. Centers/schools may design and develop courses in which the commandant/commander-approved ICTL comprises the majority of what the course must teach. All individual critical tasks on the ICTL will be taught to standard within the course. Lessons based strictly on knowledge, skills or attitudes might be included in the same course.

d. Course design may be based upon knowledge, skills or attitudes in courses with educational outcomes. Centers/schools may design and develop courses in which the commandant/commander approves the TLOs in support of educational outcomes. When the course manager or designated proponent authority is determining whether the TLOs will be at course, module, or lesson plan level, one of the criteria that should lead him or her to design the course with TLOs at the higher level (course/module) is the terminal aspect of the learning activities for the TLOs. For example, if the completion of learning activities terminates at the module or course level, such as when threading ELOs from different TLOs into multiple lesson plans, then the learning activities terminate at the module or course level. Figure 6-1 illustrates this design flow. As stated earlier, the hierarchy of subordinate knowledge, skills and attitudes (intellectual/cognitive skills), and any performance steps and measures, that support the educational outcome(s) is determined by using the analysis information or conducting an appropriate analysis. The TNGDEV uses this information to build and sequence the lessons, modules, and/or phases within the course. Course-level TLOs identified from this analysis must be included for new or revised courses. Course-level TLOs must meet the action/condition/standard criteria.

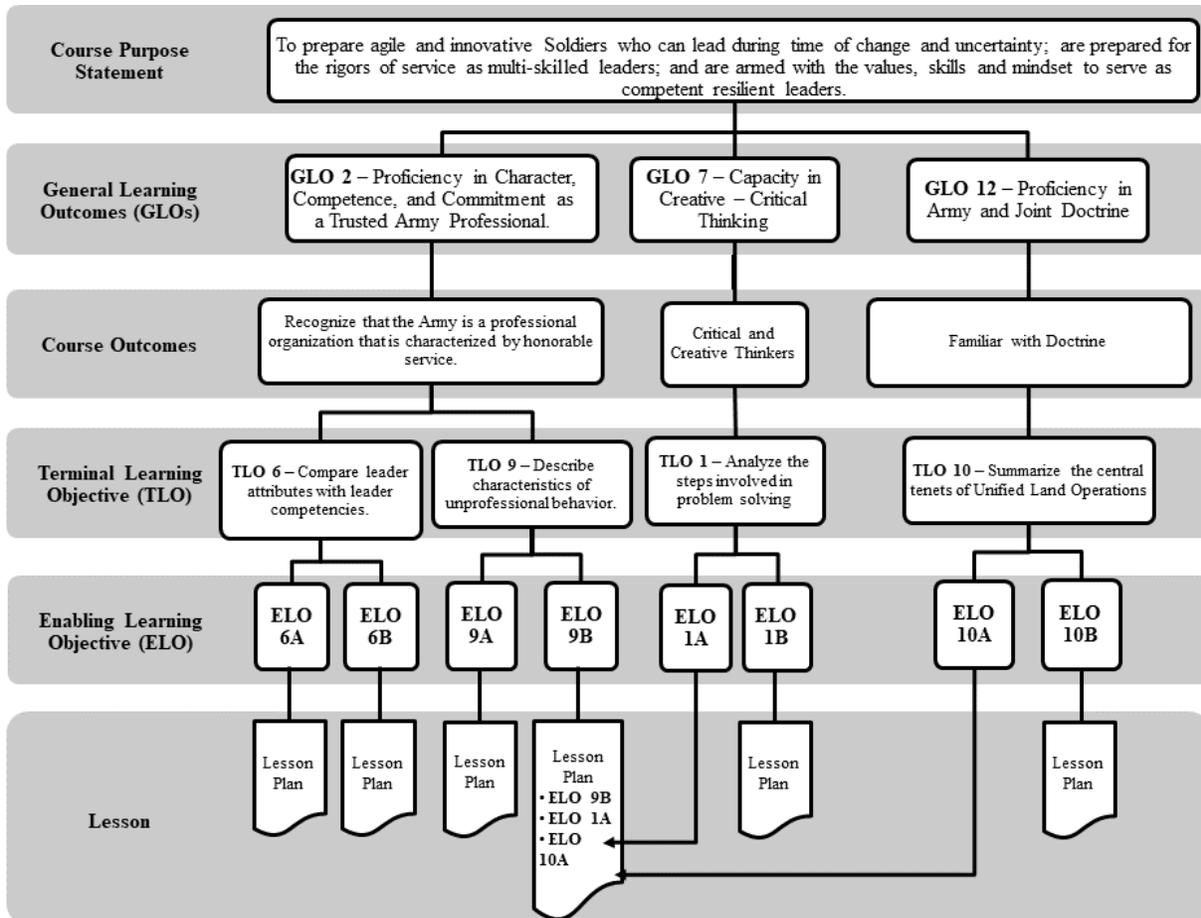


Figure 6-1. Course-level terminal learning objective design example

e. During course design, the following considerations should be applied:

(1) Avoid redundant training. The repeated training of a task at subsequent skill levels is redundant training. Training proponents should ensure that each course initially trains only those critical tasks for the skill level.

(2) Use refresher training to reinforce previous training and/or sustain/regain previously acquired skills and knowledge. A higher skill level course may reinforce lower skill level tasks and supporting skills and knowledge.

(3) Design courses so they are adaptable for MOS reclassification training. Separate modules allow for reclassification training of branch-specific as well as new shared-task training. Reclassification courses train Soldiers to perform a different job within a given career management field (CMF) (from one MOS/AOC to another) and across CMFs (one CMF to another).

(a) Design courses into modules to allow for training of those tasks needed for job reclassification only (usually required branch-specific as well as shared-task training). Properly

developed modules will lend themselves to reclassification training within a given CMF as well as across CMFs.

(b) Design a reclassification course by first preparing a task list specific for the Soldier(s) being reclassified in order to identify the actual tasks to train. (See figure 6-2 to prepare this task list.)

1. Compare critical task lists for the Soldier's current job and the job to be trained.
2. Eliminate the tasks the Soldier has been trained to perform from the new job task list. This includes –
 - (a) Common Soldier tasks.
 - (b) Common skill level tasks.
 - (c) Shared Combat Arms, Combat Support, Sustainment.
 - (d) Shared branch tasks.
3. Design training to train the remaining tasks (basically MOS/AOC-specific and shared tasks as needed).
 - (a) Consider DL for reclassification training. If interactive multimedia instruction (IMI) is used in resident initial entry training (IET), these lessons should be designed so they may be useable for distance learning of reclassification training.
 - (b) If desired, further define training requirements by comparing the skills and knowledge for the remaining tasks and eliminating the skill/knowledge training on which the Soldier has already received training. Individual self-paced training using computer-based instruction (CBI) has the capability to provide this training.

Figure 6-2. Reclassification training design considerations

(4) For decisive action–related learning objectives, identify the necessary Decisive Action Training Environment elements created by TRADOC G-2 to create conditions that challenge learning objective(s). If other than DATE conditions are desired, consistent with the staffing requirements contained in TRADOC Regulation 1-11, request a waiver using a TRADOC Form 5 through ArmyU, CAC, and TRADOC G-2. Submit the waiver request to the TRADOC Deputy Commanding General for approval.

(5) Refer to the Army Training Network (ATN) website at <https://atn.army.mil> for additional information.

6-4. Course design requirements

a. Course design establishes how (media/method), when, and where to conduct training or education; its structure (courses, phases, modules, and lessons); sequence requirements as

applicable; assessment plan; and graduation requirements. These course design procedures are for an initial course design effort. Not all of the steps may be needed for a revision effort. A revised ITP is required for a revised course. The required course design outputs should be captured in the course master in TDC to populate select fields in the CAD and POI. The required design fields consist of the following:

(1) Course purpose and scope. Include the approved course outcomes in the scope.

(2) Course prerequisites.

(3) Structure and sequence. Establish the method(s) of delivery for each phase or module and consider any recommendations from the CTSSB; this is the method of delivery that will be used to present instruction. Ensure method(s) of delivery per module are conducive for DL management when designing courses into modules for DL.

b. A course master checklist JA is available on the TED-T website.

6-5. Course purpose and scope

a. A course purpose statement describes how the learning content contributes to Army Readiness. It should be concise and clearly state the intended target student audience for the course, and how the learned content contributes to Army Readiness (individual or unit), the Army Mission, or the Army Learning Strategy.

b. A course scope statement is a description of the extent to which the subject matter is taught and assessed. It provides a concise description of the outcomes and objectives, how the learning objectives will be assessed, and any prerequisites for the course. A course scope statement describes how the course integrates with other related training and education the Soldier will complete. It identifies the credentials, licenses, and certifications it provides or supports. A phase scope statement describes how the phase integrates with the other phases toward the completion of a course. A module scope statement describes how the module integrates with the other modules in a course. The lesson scope statement describes how an individual lesson integrates with the other lessons in the module or course. A scope statement is analogous to an abstract, executive summary (EXSUM), or a syllabus.

c. The Special Information section of the POI should contain information as directed by higher HQ, or information specific to the POI not stated in the purpose, scope, or prerequisites. Special information documentation should be directed by proponents to identify unique course or student management requirements. (See table 6-1 for examples of special information.)

Table 6-1
Special information examples

Type of Information	Example
Higher HQ–mandated Special Information: Physical Demand Requirements	<ul style="list-style-type: none"> • Pass the Army fitness test (AFT) • Frequently lifts/lowers aviation equipment (~50 lb.) waist high or shoulder carry position (~3–5 ft.). • Carries (~300 ft.) to and from the aircraft. • Frequently climbs 15 ft. from ground to top of the aircraft using footholds and grip bars on equipment. • Frequently wears 40 lb. of aviation equipment to include: Aviation Life Support Equipment vest and 3 lb. of night vision goggles (NVG) equipment attached to flight helmet for an extended period of time. • Occasionally extracts incapacitated crewmember weighing up to 250 lbs., then drags/pulls 50 ft. to emergency egress from the aircraft while wearing aviation combat equipment.
Proponent-driven Special Information: Graduation Standards Proponent-approved lesson plans establish consistent standards used during all evaluations.	<ul style="list-style-type: none"> • Pass AFT • M4 qualification (back-up iron sight and optic). • Hand grenade live employment (throw two live grenades). • The Forge (must earn the right to enter/holistic leader review). • Complete Land Navigation practical exercise. • Complete CBRN Two (2) Chamber. • Complete Buddy Team Live Fire. • Complete Buddy Team Fire and Movement Force on Force. • Complete the Anvil FTX; hasty fighting position evaluation. • Attempt to negotiate Confidence Obstacle Course and Confidence Tower, (Complete 70% of all obstacles). • Pass the Initial External Evaluation. • Pass the Final External Evaluation. • Final Inspection and in-ranks inspection (ASU); Company level drill and ceremony competition.

6-6. Course prerequisites

a. Course prerequisites identify the minimum requirements (knowledge, supporting skills, and tasks) the target audience must possess or be able to perform to attend the course. Prerequisites exist for courses, phases, modules, lessons, objectives, and learning steps. Prerequisites might include certain administrative requirements, such as Army component, a specific MOS, or additional/collateral duty assignment; a minimum or maximum rank; a specific height or size; or a security clearance. An example prerequisite is as follows: RA, Army National Guard (ARNG), or U.S. Army Reserve (USAR) enlisted personnel qualified in MOS 13B in the rank of private (E-1) through sergeant (E-5).

b. The prerequisites serve the following purposes:

- (1) Establish entry-level requirements so courses have a common start point.
- (2) Limit courses to personnel who require training/education for job performance.
- (3) Support development of sequential, progressive training and eliminate or prevent development and implementation of unplanned or unnecessary duplicate training/education.

c. Examining course prerequisites helps to decide if diagnostic assessments, pre-assessments, post-assessments, or remedial or supplemental materials are required for successful course completion. (See table 6-2 which lists the steps to identify course prerequisites.)

Table 6-2
Course prerequisite determination

Step	Action
1	Review analysis data (target audience and individual task).
2	Crosswalk the required skills and knowledge with the skills and knowledge acquired from previous courses or job experience.
3	Review the DA 611-series publications for specific MOS/AOC requirements. Examine physical profile, civilian education level, aptitude scores, and occupational specialty enlistment requirements.
4	Examine other sources of relevant data, such as: <ul style="list-style-type: none"> • Manpower and personnel integration plan for the likely characteristics of personnel for new material or equipment, and the range of individual qualifications and dimensions for proposed operators and maintainers • Available studies or ARI data • Human Resources Command reports and databases
5	Enter course prerequisites in TDC.

d. For QC, individuals involved in writing and reviewing learning design must ensure the prerequisite skills and knowledge identified are included in lower level training which is prerequisite to the new/revised training. The prerequisites should not be included in the new/revised training except as planned reinforcement (sustainment or refresher learning).

6-7. Course structure and sequence

a. A course can be comprised of phases, modules, and/or lessons. Courses can have one or more phases and usually have several modules. Course design translates lessons into sequential, progressive learning phases and modules. This ensures the overall efficiency and effectiveness of the total course, including identification of all resource requirements.

(1) Phases divide a course into complete blocks that allow for providing the instruction via different delivery options. For example, phase I may be a resident phase, and phase II may be a nonresident/DL phase. Each phase has its own distinct CAD and POI in order to capture complete resource requirements by phase and allow for rapid response to changes as they occur.

(2) Grouping TLOs into modules promotes efficiency in the course structure (discussion of TLOs appears in chapter 7). Using modules allow appropriate amounts of time between instructing dependent objectives. In TDC, when grouping lessons into modules, the lesson plan supporting administrative information and resource data can be pulled into the POI.

(3) Figure 6-3 depicts how the course structure generally organizes and sequences the phases, modules, and lessons.

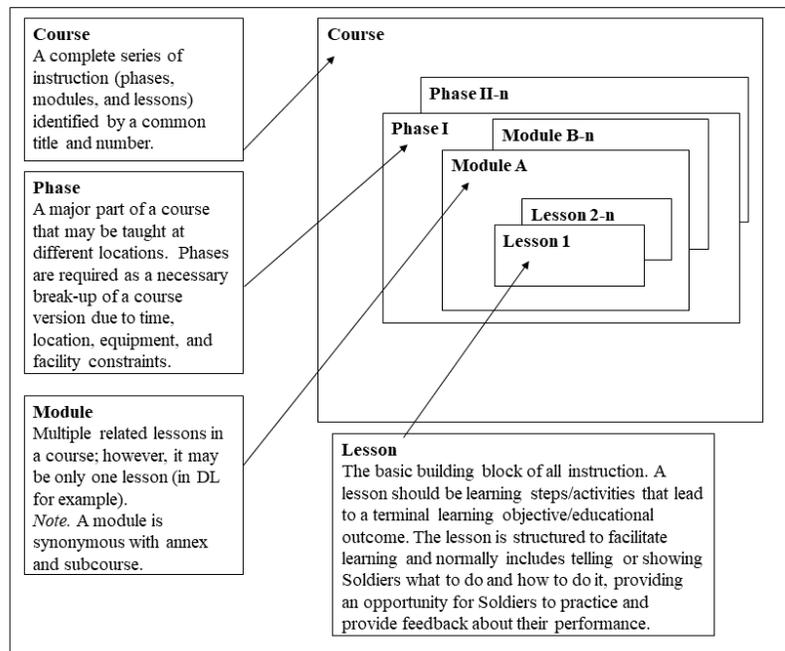


Figure 6-3. Course structure and sequencing sample

b. Developers must consider continuity and retention factors when designing course structure and sequencing. The process steps to promote continuity and retention during course design are described below.

(1) Portray the initial course structure in an outline. The outline serves as a working document, allowing flexibility to modify lessons and learning materials or products as needed.

(2) Identify and sequence the phases and modules. An optional supporting product is a matrix showing dependent relationships among tasks, skills and knowledge, and learning objectives to identify and sequence the modules.

c. The course structure may include phases, modules, and lessons using different media for various modes of course delivery (resident, nonresident/DL, or blended). Table 6-3 defines course delivery modes.

Table 6-3
Course delivery modes

Delivery mode	Definition
Resident Training	Training presented, managed, and controlled by an on-site instructor or facilitator, small group leader or otherwise designated trainer.
Nonresident Training	Individual training distributed to students for completion without the presence of an on-site instructor/facilitator, or small group leader or otherwise designated trainer.
DL Asynchronous	Asynchronous interaction occurs when students have delayed communications with their instructors (for example, email, recorded video, online Asynchronous discussions, and submissions of studies and papers) or when students are engaged in self-paced instructions without the benefit of access to an instructor (for example, CD-ROM, based courseware, web-based courseware, or correspondence courses).
DL Synchronous	Synchronous interaction occurs when students have near real-time communication with their instructor (for example, video tele-training, Internet chat rooms, or virtual environments).
Blended	Blended learning is a mix of synchronous and asynchronous media methodologies to best meet the instructional goals. It combines face-to-face classroom methods with technologies - delivered instruction that can be delivered in a resident or non-resident to form integrated instructional approach.

6-8. Course design components

Design produces the details of when, where, and how to meet the learning outcomes. If the results of analysis represent a need for learning, then the design process begins. During this phase, TNGDEVs generate learning outcomes; sequence content; design assessments and strategies; determine instructional methods, media types, and delivery systems; and develop evaluation plans. During course design, TNGDEVs perform the procedures described below.

a. Acquire and use the analysis information.

(1) Use approved ICTLs and individual task analysis information as the primary basis for most IMT courses (those producing an enlisted MOS, warrant officer MOS, or officer AOC), for many intermediate level career progression courses, and for most ASIs, SQIs, and SIs. Revisit the job analysis, if necessary. Complete or review/revise the individual task analysis for tasks on the approved ICTL. The individual task analysis enables a less complex approach for course design, because the knowledge, skills, attitudes, and performance steps will be determined in that individual task analysis. This enables a straightforward translation of the action verb in the task to an action verb for the learning objective.

(2) Use approved knowledge, skills or attitudes, derived from either job analysis and/or individual task analysis, as the basis for PME courses. Courses generally have a broadly stated purpose, educational outcomes, and establish TLOs derived from knowledge, skills or attitudes. This design allows for a straightforward translation of the verb in the knowledge, skills or attitudes to the verb in the learning objective.

(3) Review the applicable regulations and directives that govern the function(s) for functional courses. Establish individual tasks performed by the function (a job analysis may be required). Conduct an individual task analysis to identify the knowledge, skills, and attitudes involved. See TP 350-70-1 for how to develop individual tasks.

(4) Conduct or review/revise the appropriate analysis from which to base effective learning objectives for courses with both task-related and education-related outcomes.

(5) Use the most current analysis information or conduct new analyses, as appropriate, when conducting the periodic maintenance review of an existing course.

b. Complete the development of learning objectives. A learning objective is a statement that indicates the level and type of proficiency a learner will have at the end of a course or lesson. One of the most important steps to course design and development is developing and writing learning objectives. Learning objectives serve as the foundation for instructional design, provide the basics for instructional strategy decisions, establish clear and concise learner goals, determine content of the instruction, and serve as a basis for learner assessment. Use the task, knowledge, skill or attitude learning objective action statements developed during the analysis phase to complete the development of all learning objectives.

(1) A learning objective consists of three components (action, condition, and standard) that describe expected learner performance under specific conditions to a measurable standard. Write the components of learning objectives (action, condition, and standard) as statements. The learning level and domain (cognitive, affective, and psychomotor) are optional components to the learning objective statement except when there is a specific accreditation standard that requires them.

(2) The TLOs and ELOs are the two types of learning objectives in course or lesson design. TLOs are the main objective of a lesson or an objective within a module or course identified during analysis. The learning level of at least one of the ELOs has to be equal to the learning level of the TLO. ELOs are the prerequisites required to achieve the TLOs. These are the standards identified in the TLOs, written in action verb form. (Adding an action verb to the TLO standard provides the action statement for the ELO.)

c. Review design guidance. Conduct preliminary research for possible course or lesson materials. Identify information (resources, methodology, current and emerging doctrine, publications, and guidance) available to assist in meeting the objectives.

d. Design instructional strategies. Determine the optimum training and/or educational and instructional/facilitation strategies for each learning objective. This includes learning activities, pre-instructional activities, presentation of content, learner participation strategies, and learner and instructor support materials.

e. Design assessment strategies. Plan how to measure whether learners met the stated objectives, identify any learner assessment criteria (tests), and determine how to assess the

accomplishment of each learning objective. Strategies that may be used to accomplish this include:

(1) Analyze each learning objective to determine what assessment methods are appropriate and determine how to measure the objective.

(2) Design the course assessment criteria. Assessment criteria specifically identify what process or product to use to assess learners. This must match the learning objectives and the learning level identified in the objectives. For example, if the learning level is analysis and the assessment plan identifies a written test as part of the assessment, write the assessment at the analysis level.

(3) Design sample assessments and rubrics to measure the learning objective. Assessments may be in multiple formats to include briefings, plans, papers, skits, role-play exercises, tasks, products, and other instruments.

(4) Use analysis documents, instructional strategy guidance, and requirements to meet the learning objectives to design appropriate assessment strategies. This process feeds into the ISAP and the design of assessment tools. Assessment strategies form the assessment and make up the reliability and validity of an assessment instrument.

f. Design assessment plan and sample assessment tools. Plan how to measure whether learners met the stated objectives, and design assessment tools to measure learner achievement. All assessments require rubrics or score sheets to provide learners with feedback and faculty with tools to assess learning. These tools help identify how the learning objectives are assessed and designed based on the test blueprint designed in the assessment strategies process. Prepare samples of any tools used and ensure the tools will collect the data to measure the program's success. Additionally, measure assessment tools for reliability and validity.

g. Establish the preliminary design of the course and create the course map. The course map frames the development process, sequences events, and identifies design flow. It is the learning product blueprint. Design a course map by placing learning objectives in instructional sequence; order content progressively and sequentially; place lower-level learning objectives up front; introduce broad concepts and technical terms early; provide practice and review of concepts and knowledge that are essential parts of later lessons; and introduce a concept in the lesson where it is most frequently used.

h. Develop preliminary design (course level). Identify how the media, MOI, and other design components will come together to make up the design of the learning product (course level or lesson level). In this phase, one of the first and most important actions is selecting the MOI for the course or lesson—in effect, selecting the procedures used to attain the objective. An instructional program may require different methods at different times. The importance of a MOI lies in how well it accomplishes the course or lesson objectives.

i. Establish graduation requirements (these include the knowledge, skills and attitudes required to graduate and are reflective of job performance capabilities). Decide whether the

learning product will include course growth based on the preliminary course design specifications.

j. Design validation and evaluation plans. Begin designing/developing the evaluation plan after completing all analyses. The evaluation plan is a document that describes the context, purpose, tools, implementation plan, and final report for the program evaluation. The evaluation plan determines potential evaluation processes to measure course success. (See chapter 12 for the steps to create an evaluation plan).

k. Create a lesson outline. See chapter 7 for more information.

l. Use course/module-level TLOs. This course design is often used when developing courses with educational outcomes. Use this course design approach as an option when there is a broad educational outcome that is based on knowledge, skills or attitudes. TNGDEVs perform the following process steps for designing course/module-level TLOs:

(1) Conduct job and/or individual task analysis to identify the knowledge, skills and attitudes that support the educational outcomes in order to determine the TLOs. Given every TLO requires an assessment, use this analysis information to derive the TLO statement that meets the action, condition, and standard criteria. (See figure 6-1 for a course-level TLO design example.)

(2) Group similar knowledge, cognitive skills, and attitudes for efficiency when developing a course map. Different components of an ELO may be supporting a knowledge, skill or attitude of a different ELO knowledge, skill or attitude. This is similar to teaching multiple knowledge, skills or attitudes in a lesson that teaches an individual critical task. The name of this process is threading. (See figure 6-1 for an ELO threading example). In this example, lessons may be ELOs and/or learning step activities (LSAs) that progress toward attainment of the course/module TLO(s). The verb in the learning objective action statement reflects the domain (cognitive, affective, or psychomotor) and the level of learning; the condition(s) reflect the learning environment or conditions related to the learning setting; and the standard statement establishes criteria for successful performance of the action. (See chapter 7 for lesson design.)

m. Design modules. A module is a group of related lessons that promotes efficiency in the course structure. In rare cases, a module may be comprised of only one lesson based on a single TLO. Use modules to allow appropriate amounts of time between instructing dependent objectives. In TDC, group lessons into modules to facilitate pulling the supporting administrative information and resource data from the lesson plans into the POI and TSP.

n. Create a course map. Incorporate all of the design documents and specifications to create a course map that graphically includes the mandatory training sequence of the phases, modules, and/or lessons; the sequence of prerequisite lessons aligned with the follow-on lessons, the learning outcomes to meet; and the learning gaps. (See figure 6-4.)

o. Create the ISAP. See chapter 11 for the steps to create the ISAP.

p. Update resource analysis. Resource needs may change throughout the ADDIE process. Review the resource estimate and make any necessary changes.

q. Update milestone plan. Review and update the milestone plan created in the analysis phase. This is a critical step because the milestone plan guides the course building process.

6-9. Course development

The development phase of ADDIE refers to developing the details of the product. Course development is a matter of providing the learning products and supporting products that comprise the details of the course. These include an updated CMP, ISAP (including test designs and test items), and course map, as well as lessons, course schedule, student guide, and instructor/facilitator guide (optional). Other factors that contribute to course development include course length, resource requirements, course updates/revisions, and the POI approval process itself. For some schools, the learner and instructor/facilitator guide may provide some influence on course design. The appropriate proponent command authority approves the developed course, while TOMA validates resources.

a. Compare the analysis and design phases to ensure consideration of all aspects of the course or lesson. Before developing any materials, review the goals and learning objectives to ensure the course or lesson meets the learning outcomes. Continue to gather references and supporting materials and select or develop media and MOIs that support accomplishing the learning objectives. At the end of development, the course or lesson will be ready for implementation and the instructional materials ready for use.

b. Complete the following actions during course development:

(1) Select the instructional media. Almost without exception, every MOI needs some type of media support. No single media is the most appropriate choice for every instructional situation. Select media that support learning. The media used in a course must support the MOI selected and uphold the supported learning objective. See paragraph 7-18 for more information on media.

(2) Select or develop instructional material. Each media requires selection or development of appropriate material. Ensure that the materials are appropriate for the media selected. Review the selected material and determine its relevance and usefulness in supporting the learning objectives.

(3) Develop evaluation tools. Finalize all evaluation tools identified in the evaluation plan. Demonstrate validity and reliability for each evaluation tool and include this information in the program evaluation report.

(4) Update the resource analysis. Identify resource needs. Return to the design phase if changes are necessary. Change the methodology and media when required resources are not available to support the course as designed.

(5) Develop lesson plans and advance sheets. Base the lesson plan and advance sheet on lesson level TLOs or the ELOs from module/course level TLOs; lessons are the primary products that support the desired outcomes of a course. The lesson plan captures the resource needs that the lesson design drives. Organize what the lesson presents as well as when and how it presents the content; it is the way to communicate course intent to the instructor. The lesson plan tells the instructor how to implement each lesson in the course via instructor notes. Write the lesson plan from the instructor's viewpoint. Complete the lessons and lesson plan development prior to completing course development (See chapter 7 for lessons and lesson plans). Advance sheets are optional. They provide the learner with key information about the lesson scope, learning objectives, and study requirements. There are module advance sheets and lesson advance sheets; each has specific components. Complete the advance sheet in conjunction with the lesson plan and write advance sheets from the learner's perspective.

(6) Complete assessment instruments. Revise draft assessment instruments to create final products. Develop assessment instruments that match the learning objectives and learning levels. Develop assessment instruments to determine how well the learner accomplishes the objective, not how well the learner performs compared to other learners. (See chapter 11 for guidance on developing assessments/assessment items.)

(7) Update the milestone plan. Review and update the milestone plan developed during the analysis phase.

(8) Update the CMP. The CMP tells the course manager and instructors/facilitators how to manage/conduct the course. The CMP supports structure, sequence, and course design requirements. It lists all lessons that lead to a TLO. Prepare a CMP for courses (including The Army School System (TASS) courses, courses designed specifically for the RC, and courses taught by multiple proponents). Document any differences between the RA and RC instructor and/or learner implementation guidance. Address, at a minimum, the course structure, the course map, the training sequence, instructor certification requirements, and assessment administration guidance. Ensure the CMP is available wherever the learning product is used. Begin CMP development upon the approval of the course design and complete the CMP before submission of the POI. Use one CMP for phased courses as an option, instead of developing a separate CMP for each phase of a single course. (See appendix I for the CMP mandatory requirements).

(9) Update the course map created during the design phase of ADDIE and create the schedule.

(a) Update the course map as a compilation of the course structure, based on the course content outline previously developed, with lessons sequenced as necessary or appropriate. When the lesson plans are completed, detail the final establishment and sequence of the lessons in the course map, which is a graphic portrayal of the overall course's presentation. The course map ensures horizontal and vertical alignment of the phases, modules, and/or lessons to support the learning outcomes. The mapping process involves identifying where in the course to introduce, develop, and master each learning outcome. Publish the course map in the CMP.

- The course map shows the mandatory training sequence for the course. It is imperative to teach each lesson identified as a prerequisite for another lesson before presenting the follow-on lesson. This mandatory training sequence cannot be violated. Failure to follow this sequence means learners will receive training for which they have not received the prerequisite training. Course mapping involves developing a master chart that indicates which outcomes to meet, to what extent, and how often.
- The course map visually and substantively reveals any learning gaps in the program that could cause difficulty in meeting the program’s measurement targets for its learning outcomes.
- Course maps provided in TRAS documents should display the generic course map elements as shown in figure 6-4. The generic course map depicts a course divided into phases with estimated hours, and modules with delivery mode, estimated hours, and lessons per module identified.

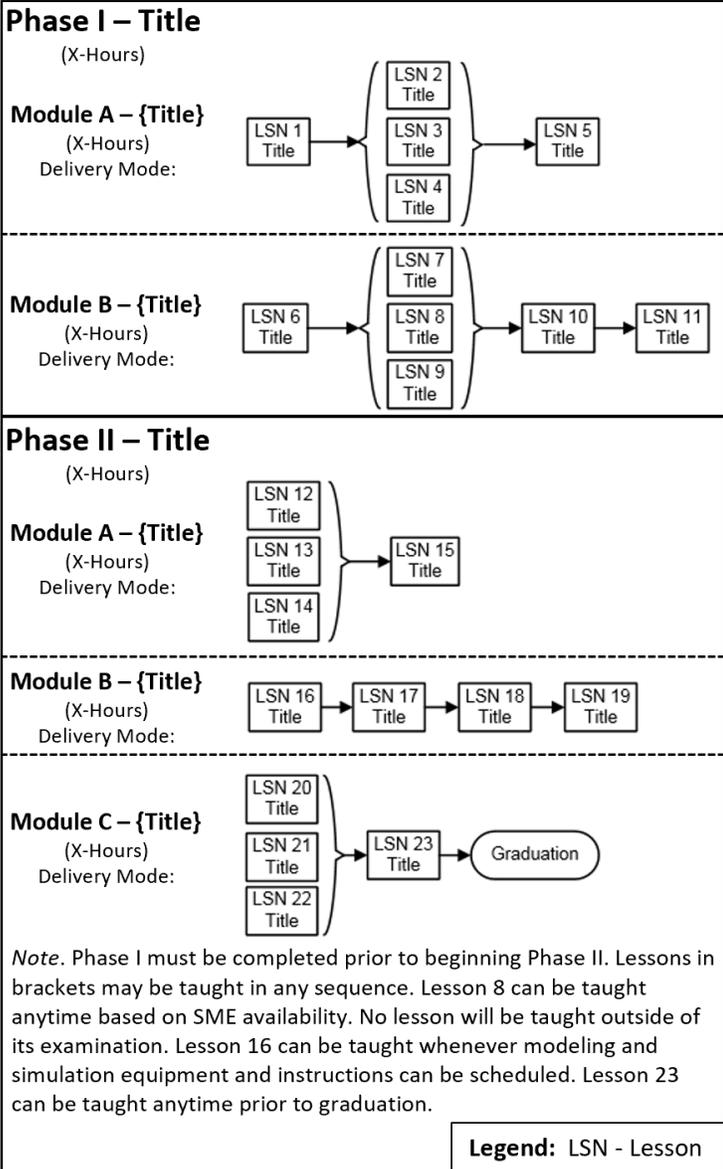


Figure 6-4. Sample course map with phases, modules, lessons, and notes

(b) Provide input to the schedulers for the course based on the structure, sequencing decisions, and the course map. Learning should be sequenced progressively. TLOs should be tied together logically and efficiently by performing the following steps:

- Identify and sequence the lessons into modules. Some modules may teach specific items of equipment to the RA or RC based on equipment assigned to their units.
- Identify and sequence the modules into phases or a course. ATRRS treats a phase as a course. ATRRS can then put multiple phases together as a graduation requirement.
- Establish the method of delivery for each phase/module.

(c) Other contributing factors that determine logical sequence of learning outcomes include job performance order, chronological order, cause and effect order, critical order, and simple-to-complex order.

(d) A course schedule is a chronological order sequence used to outline each hour and day of instruction. It is usually based on 50 minute blocks of instruction and outlines the subjects to be covered, as well as practical exercises and scheduled assessments.

(e) Another factor that affects sequencing of lessons is the instructional strategy and MOIs for lesson delivery.

(f) In some cases, there is a need for alternate acceptable lesson sequences for instruction due to classroom, instructor, and/or equipment limitations. In these cases, lesson sequence variations should be included with the course schedule along with course map notes such as those provided in table 6-4.

Table 6-4
Example course lesson sequence

Schedule	Phase I – Alternate lesson sequences
A	1, {2, 3, 4,} 5, 6, {7, 8, 9,} 10, 11
B	6, {7, 8, 9,} 10, 11, 1, {4, 3, 2,} 5
C	1, 6, {9, 8, 7,} 10, 11, {2, 3, 4,} 5
D	6, 1, {2, 3, 4,} 5, {8, 9, 7,} 10,11
Schedule	Phase II – Alternate lesson sequences
A	{12, 13, 14,} 15, 16, 17, 18, 19, {20, 21, 22,} 23, graduation
B	{14, 12, 13,} 16, 17, 18, 19, {21, 22, 20,} 23, 15, graduation
C	{20, 21, 22,} {13, 14, 12,} 23, 15, 16, 17, 18, 19, graduation
D	{22, 20, 21,} {12, 13, 14,}, 16, 17, 18, 19, 15, 23, graduation
<i>Note.</i> Bracketed lessons can be taught in any order based on facility and equipment availability	

(g) To ensure a quality learning sequence, the individuals involved in structuring the learning and establishing the sequence must ensure the sequence provides progressive learning and a viable course map.

(10) Course length is expressed in weeks and days. The course length is determined by the total academic hours required to conduct the course/event. Academic hours are used to determine the ICH. TOMA (or ATRRS manager for non-TRADOC schools) validates, manages, and enters TRADOC-approved course lengths into ATRRS. For TDY - length courses, mandatory training is the unit commander's responsibility and curriculum will not be modified to add mandatory training subject matter. For PCS - length courses, Commandants should conduct mandatory training as much as possible as part of administrative time; however, Commandants retain the discretion to incorporate subject matter into the curriculum where appropriate.

(a) Academic hour is the amount of instruction the average student can complete in 50 minutes plus an allowance of an average of 10 minutes for administrative/break time per each 50-minute segment. Also, academic hours are the total length of time actually required to present instruction and includes conducting instruction, assessment, and an AAR. Academic hours capture the instructor's work hours when they are with the students formally executing the POI. The lessons are the basis for instructor contact hours (ICHs). Academic hours are used to determine the course length. (See paragraph 7-17 for discussion of instructor actions (IAs)). Lesson length is the sum of the LSA's time of instruction in minutes but does not include course administrative time. The TNGDEV identifies any mandatory time requirements for specific LSAs (otherwise, time requirements are estimates). (See paragraph 7-7 for a description of LSAs.) Presenting learning in smaller packages and avoiding excessive lesson length helps to keep learners focused on the lesson.

(b) Administrative time is all non-academic time included in a course and it is represented as the total hours necessary to perform administrative activities. Administrative time is actions required to administer the course but not POI driven. The following activities are examples of administrative time:

- In-processing.
- Course overview/orientation.
- Graduation/out-processing.
- Guard detail.
- Commandant's time.
- Awareness training and education.
- Unit commander's orientation.
- Remedial instruction.
- Reassessment.
- Physical readiness test (may include pre- and post-).
- Payday activities.
- Instructor-to-student or peer-to-peer counseling.
- Mandatory training and Command directed learning which has NOT been incorporated into the proponent curriculum.

(c) Home study/homework assignments/independent study/study hall/everyday physical readiness training/balls/pre-graduation or graduation dinners do not receive administrative time credit.

(d) Module length is the sum of included lesson lengths. Phase length is the sum of the included module lengths.

(11) Refine the ISAP. Refine the ISAP along with the assessment instruments and/or tests in conjunction with the lessons and lesson plans. Each course must have an ISAP and it must minimally note the assessment for each TLO. The ISAP informs learners, instructors/facilitators, and other personnel of graduation requirements. Elements of the ISAP are included in the student guide (syllabus). For all Army courses, explain the ISAP to learners at the beginning of the course and post it for the learners' reference. Have the learner sign a document to acknowledge receipt and understanding of the ISAP content. The ISAP must reflect TRADOC testing policy and must be included in the TASS course TSP. The ISAP establishes policies and procedures that state learner responsibilities. It also establishes how the proponent school will determine if the learner has demonstrated a sufficient level of proficiency to meet graduation requirements. The plan must include details of how to assess the learner's performance. The ISAP is complete when approved for implementation by the appropriate designated authority. For IMT, the ISAP requirements are different. See chapter 11 for assessment planning and guidance for developing assessments and testing.

(12) Develop the TSP. The TSP is a complete, exportable package integrating training products/materials necessary to train one or more critical individual tasks. It could be a package for an entire course, for a single task, for new equipment/system training, or for common core. It can be trained at training site(s) other than the development location, such as an RA school, a TASS school battalion, a unit, or a DL site. Training may be conducted using formal instruction, self-study, or DL in a live, virtual, or constructive environment. TDC compiles several components of a student guide in the TSP. Provide sufficient detail and direction to make the TSP useful. See TSP development in chapter 9.

(13) Write the student guide. The student guide provides information required by learners to meet their responsibilities for learning and successful completion of the course. The guide also contains the learning/training objectives, expected outcomes, and a copy of the course critique that the learner is expected to submit before completion of the course. The student guide serves several important purposes, as listed below:

- (a) To convey expectations for the course.
- (b) To show how the course fits into a broader context.
- (c) To state policies, requirements, and procedures for the course.

(d) To set the tone for the course and convey the expected roles of the instructor and the learners.

(e) To help learners manage their learning by identifying outside resources and/or providing advice.

(f) To communicate course goals and content to colleagues.

(14) Develop an instructor/facilitator guide (optional). An instructor/facilitator guide is a document that contains information needed to teach a course. Use it as a best practice. Include enough detail for full implementation of the lessons by a novice instructor. Include such items as room requirements; a list of necessary training materials such as workbooks and reference manuals; administrative notes about break areas and other information; before, during, and after instruction information; presentation requirements; and copies of lesson plans to include slides and handouts. TDC can compile several components of an instructor/facilitator guide automatically as part of the TSP. Provide sufficient detail and direction to make the TSP useful and include it in the instructor/facilitator guide.

(15) Update/revise course design as needed. Review and update/revise any portion of the course design and development steps prior to submitting for approval. Pay particular attention to the course structure or course map and make adjustments as needed.

6-10. Resource requirements

TRAS documents provide the planning and justification documentation to articulate resourcing requirements. Produce and refine them concurrently with course design and development. The goal for budgeting and resourcing Army learning products is for the products to link with the resource processes and systems to acquire the necessary resources in time and at the right place to accomplish training/education. A variety of systems and processes work concurrently to support the development and delivery of learning products. The three primary TRAS documents for resourcing courses are the ITP, CAD, and POI. The POI and CAD are developed and stored in TDC. Link the ITP as a supporting document. For detailed information on TRAS documents and exceptions for funding training and education see TP 350-70-9.

a. Individual learning plan. Publish an ILP for each job and/or function for which they have functional authority. The ILP codifies and executes the learning strategy. Each plan describes the learning outcomes and learning objectives (training and education) of an individual over a career. ILPs include MOS ITPs, functional training resource and milestone plans, and PME resource and milestone plans. See TR 350-70 for additional information.

b. Individual training plan. ITPs describe the overall plan to satisfy learning requirements for an individual's entire career. They are long-range planning documents, prepared for each military or civilian occupational specialty or learning program. TP 350-70-9 provides more information.

c. Course administrative data. The CAD is a TRAS document that is the proponent's initial estimate or projection of a course's administrative data and resource requirements. It serves as a change document for submission of administrative and resource changes to a specific course or course phase, stimulates changes to the Army's institutional training management systems, and

stimulates resource systems and processes needed to acquire the resource before the course implementation date.

d. Program of instruction. The POI is the most complete institutional training resource document used for all courses. It provides a specific description of course content, duration of instruction, and types of instruction, as well as lists resources required to conduct the course/phase. POIs are organized by modules and lessons in the preferred sequence of instruction. POIs list the task(s) and TLOs, needed support materials, and training time apportionment.

(1) TDC generates a final POI once all lesson plans have been completed and approved within the TDC database. POIs will be developed and stored in TDC.

(2) Develop POIs for courses taught through the Inter-Service Training Review Organization (ITRO). Inter-service training occurs when one or more military Services train together in a formal environment on individual skills in an institutional setting, as explained in AR 351-9. AR 351-9 describes policies, responsibilities, and procedures for inter-service training and nonresident/DL courses including DOD executive agent training, joint training, quota training, and ITRO training. ATRRS classifies ITRO courses as either consolidated or collocated (service-unique). ITRO uses a detailed analysis methodology to determine fair share of resources to support training in consolidated courses (manpower, facilities, and funding). In addition, the ITRO provides a mechanism for resolution of issues that may arise during the life cycle of a consolidated and/or collocated course.

(3) The proponent commander/commandant or the designated representative approves the POI. After the commander/commandant approves the POI, staff it along with other TRAS requirement documents like the ITP and the CAD, to TOMA for validation and resourcing. (See TR 350-70 and TP 350-70-9 for staffing the POI as part of the TRAS documents.)

6-11. Career map

Produce a career map, in coordination with RA and RC representatives from the operational training domain. ILPs inform the career map and support career progression in accordance with the learning strategy. The career map illustrates the corresponding OISD training domain, skill level, and timeline of the learning objectives and individual tasks across a Soldier's or DA Civilian's career.

6-12. Quality control for courses (evaluation and validation)

a. Course evaluation and course validation help identify and correct instructional system imperfections. The evaluation and validation process determine if instructional system content, sequence, methods, and media decisions are sound. Decisions are sound if minimal time, money and other resource investments result in desired learner behavior changes. Ideally, evaluation and validation are a concurrent and continual process applied when developing course portions.

b. Validation scrutinizes all aspects of the course/courseware. Since it is impractical and impossible to conduct an intense analysis of all aspects of a course or courseware at one time,

validation focuses on specific aspects throughout the development process. The five critical validation activities are to establish criticality standards, validate content, conduct individual trials, conduct group trials, and conduct operational tryouts.

(1) Establish criticality standards. The criticality standard is a measure of effectiveness used to establish validation requirements. The criticality standard specifies the percentage of learners that must pass each objective the first time, upon completion of the instructional materials for that objective. Use the JA Criticality Standards for Rating Learning Objectives on the TED-T website to assist with the criticality standards measure of effectiveness. If this standard is not met, the materials do not validate, and they require revision.

(2) Validate content. Content validation is the process used to verify that the information in the course materials is technically and doctrinally accurate. During this process, SMEs review all course/courseware materials and supporting documentation, to ensure that all materials meet the following standards:

(a) Are doctrinally and technically correct and complete.

(b) Include sufficient detail.

(c) Are clear and meet AR 25-50.

(d) Use language that the target audience understands.

(e) Use current, appropriate, and applicable references along with the course/courseware content validation data collection sheet JA, on the TED-T website.

(3) Conduct individual trials. Individual trials are the process that begins examining the educational sufficiency of instructional materials. The purpose of individual trials is to obtain an initial determination on whether the materials train or educate the learner on the objective, so the learner meets the objective standard. Trials allow the TNGDEV to gather formative evaluation data by exposing a sample (one person) of the target audience to the instructional materials, and then conducting an in-depth interview with that person to identify problems, before going to group trials. Data collection is based on the conduct of the trial and the resources available to support the validation efforts. The preferred data collection method is personal interviews. Data collection sheets support information gathering during individual trials. Army centers/schools and institutions may select from four different data collection instruments/JAs available on the TED-T website or use a suitable data collection instrument that adequately supports their data collection needs. The JAs and their uses are described below:

(a) Validation Volunteer Course Data Collection Sheet for Individual Trials. Use this JA to gather data from the volunteer on the educational sufficiency of the objective. Use this JA with both instructor-led courses and automated courseware.

(b) Instructor/Observer Course Data Collection Sheet for Individual Trials. Use this JA to gather data from observers and the instructor on the educational sufficiency of the objective. Use this JA with both instructor-led courses and automated courseware.

(c) Validation Volunteer IMI Courseware Data Collection Sheet for Individual Trials. Use this JA to gather information from the volunteer on the operability (such as loading and starting) and the functionality (such as menus and buttons work properly) of automated courseware. When using this JA, also use the Validation Volunteer Course Data Collection Sheet for Individual Trials JA.

(d) Validation Instructor/Observer IMI Courseware Data Collection Sheet for Individual Trials. Use this JA to gather information from the instructor and observers on the operability (such as loading and starting) and the functionality (such as proper working) of the automated courseware. When using this JA, also use the Instructor/Observer Course Data Collection Sheet for Individual Trials JA.

(4) Conduct group trials. The group trials process is used to validate a lesson/lesson plan's individual objectives based on observations and statistical analysis. The purpose of group trials is to validate the terminal learning objective of a lesson as being instructionally sound (based on statistical analysis) and identify problems with the flow and content of the instruction, before investing in the expense of operational tryouts, and final reproduction and distribution. Group trials allow the TNGDEV to gather formative evaluation data by exposing a group of volunteers (a minimum of 10) from the target audience, or a group of volunteers that possess the critical characteristics of the target audience, to the instructional materials. Five data collection instruments/JAs to support this process (Validation Course/Courseware Volunteer Data Collection Sheet for Group Trials, Validation Course/Courseware Instructor/Observer Course Data Collection Sheet for Group Trials, Validation Volunteer IMI Courseware Data Collection Sheet for Group Trials, Validation Instructor/Observer IMI Courseware Data Collection Sheet for Group Trials, and Sequential Validation) are available on the TED-T website.

(5) Conduct operational tryouts. An operational tryout is a process to validate a course, lesson, or the individual objectives of a lesson based on observations and statistical analysis. The purpose of operational tryouts is to test the instructional materials under actual training conditions. The operational tryout is conducted using the target audience for which it was developed. The goal of conducting an operational tryout is to determine if the materials are ready for fielding. The Validation Courseware Data Collection Sheet for Operational Tryouts JA is available on the TED-T website.

c. The following guidelines describe elements to ensure quality results from the course:

- (1) Training/education is sequential and progressive.
- (2) Design applies sound learning development principles.
- (3) Design and development are technically correct.

(4) Learner assessment is at the correct learning level and aligned with the learning objectives determines if learners can accomplish the learning objectives.

(5) Design and development include the most efficient and effective MOIs, modes of delivery, and site selections.

d. The TRADOC QAO website provides more information on QA for courses. The Validation Planning Considerations Worksheet, on the TED-T website, is an additional JA to support planning course and courseware validations. Chapter 12 contains detailed information concerning evaluation.

Chapter 7

Lessons and Lesson Plans

7-1. Lessons and lesson plans introduction

a. A lesson is the basic building block of all instruction. It is the instructional content for the learners to learn about a particular subject or performance of a particular activity. Lessons can occur in a variety of learning environments. Each lesson is a segment of instruction that facilitates the accomplishment of learning step activities that lead to achievement of a learning objective. The design and structure of a lesson facilitates learning and normally includes imparting verbal information or conceptual or factual knowledge, imparting procedural knowledge (telling or showing learners what to do, how to do it, and when to apply the skills), providing deliberate practice (enabling the learner to work toward specific objectives), and providing feedback about individual performance. A lesson plan supports and documents each lesson. The TDC database provides automated tools to build and maintain lesson plans.

b. A lesson plan is the detailed development of information and resources used by instructors/facilitators to execute the instruction prescribed in one lesson within the prescribed time limits using the specified resources. A lesson plan includes the content and supporting information for only one lesson.

c. The following guidelines apply to all lessons and lesson plans:

(1) Lessons must be current since the last review (actions, conditions, and standards have not changed).

(2) Lessons provide adequate technical information and support material for standardized instruction and achievement of the learning objective(s).

(3) Lessons must have an objective assessment.

(4) Lessons must be structured to facilitate maximum learning by all learners.

d. Instructors/facilitators, course managers, TNGDEVs, and leaders review and update lesson plans to keep them current. Proponent COE/school leaders approve lesson plans per their respective policies. Instruction presented by a guest lecturer (a person not affiliated with the course) also requires a lesson plan.

7-2. Analysis for lessons

a. Before revising or developing lessons, proponents review the information from the individual critical task analysis, job analysis or other analyses done that determined the task, knowledge, skills or attitudes the Soldiers, leaders, or DA Civilians need to perform their jobs in the operational domain. If necessary, proponents perform the appropriate analysis, determine what information (knowledge, skills, or attitudes) must be learned, and write complete learning objectives (action, condition, and standard) before commencing with lesson design and development.

b. Prior to redesigning or creating new lessons, proponents analyze the current lesson(s) to verify the alignment of learning objectives and their assessments. The analysis also checks that the current lesson(s) continue to support training and instruction of the individual critical tasks, knowledge, skills, or attitudes that will build capable and ready Soldiers, leaders, and DA Civilians. Proponents conduct the appropriate type of analysis before creating new lessons given most often they are revisions of current products.

7-3. Learning objectives and learning domains

a. Learning objective types. Objectives are the cornerstones of learning. TNGDEVs develop objectives for all levels of instruction where measurement of learning is required. The two types of learning objectives are TLOs and ELOs.

(1) The TLO is the main objective of a lesson or, depending on the course design, it may be a main objective within a course. The TLO describes, in observable, measurable, and achievable terms, what the learner should be capable of performing under the stated conditions to the prescribed standard, upon lesson or course completion. A lesson may contain the TLO, or a lesson may contain ELOs that support multiple module- or course-level TLOs. The location and number of TLOs and ELOs depends on the course design. Paragraph 6-3 addresses course design considerations, and paragraph 6-8.b describes development of learning objectives.

(2) An ELO defines a subset of the knowledge, skills or attitudes learners must reach to complete the TLO. ELOs allow the TLO to be broken down into smaller, more manageable objectives. An ELO is subordinate to and supports the TLO and measures an element of the TLO. ELOs are optional based on analysis of the TLO. If using ELOs, there must be a minimum of two, and at least one ELO should be at the same level of learning as the TLO (to demonstrate progression in the learning). ELOs should not be at a higher level of learning than the TLO they support.

b. Learning objective characteristics and purposes. Proponents will develop clear, concise learning objectives to describe the action, condition, and standards for learner performance, and

document the learning objectives in TDC. Verb choice determines/indicates the level of learning, number and types of activities within the lesson, instructional method selection, instructional media selection, and assessment type. Learning objectives have the following characteristics and serve these purposes:

- (1) Serve as the foundation for lesson design.
- (2) Influence the MOI choice.
- (3) Determine the instructional content.
- (4) Serve as the contract between the learners, instructor/facilitator, and learning organization.
- (5) Establish learner responsibility and accountability by giving learners a clear comprehension of what to expect to learn and of what the Army expects of them at the end of the session.
- (6) Give the instructor a goal to achieve in presenting the content of a lesson.
- (7) Form the basis for evaluating the instructor, the learner, and effectiveness of the lesson.

c. Learning objective conditions and standards. Centers/schools and institutes teach/train learning objectives under the same conditions and standards as in a potential operational environment. However, the developer and SMEs may determine that, due to safety/environmental concerns or resource/operational constraints, the learning environment requires adjustments to the operational conditions and/or standards.

d. Learning domains. The three learning domains are cognitive, affective, and psychomotor. Each domain comprises identifiable levels that progress from the lowest level through increasingly more complex levels, to the highest complexity level. Educational institution instruction focuses on the cognitive and affective domains as reflected in the learning objectives; consequently, the educational lesson plans identify expected cognitive and affective learning levels as appropriate. The psychomotor domain applies predominately to a training environment. Educational institutions typically do not include the psychomotor domain in their curricula.

(1) Cognitive domain. The cognitive domain refers to intellectual (cognitive) skills. Intellectual (cognitive) skills include discrimination, concept, rule-using, and problem-solving capabilities. Educational environments commonly focus on intellectual skills. The cognitive domain consists of acquiring, recognizing, and manipulating facts; developing the intellectual skills to break down the facts into their components; and recognizing the organization and relationships of the components. According to the Revised Bloom's Taxonomy, the six cognitive learning levels (from lowest to highest) are: remember, understand, apply, analyze, evaluate, and create. (For all references to the Revised Bloom's Taxonomy contained within this pamphlet and all reprints see **ANDERSON\KRATHWOHLIAIRASIAN\CRUIKSHANK\MAYERIPINTRICHIRATHS\ WITTRICK, A TAXONOMY FOR LEARNING, TEACHING,**

AND ASSESSING; A REVISION OF BLOOM'S TAXONOMY OF EDUCATIONAL OBJECTIVES, ABRIDGED EDITION, 1st Ed., ©2001. Reprinted by permission of Pearson Education, Inc., New York, New York .)

(2) Affective domain. The affective domain concentrates on emotions, beliefs, attitudes, values, and feelings. The progression among the affective domain levels is from simply being aware through an organized internalization of an attitude or value, which becomes the defining characteristics of that person. The five affective learning levels (from lowest to highest) are: receive, respond, value, organize, and internalize.

(3) Psychomotor domain. The psychomotor domain consists of manual or physical activity to achieve a learning objective. The five psychomotor learning levels (from lowest to highest) are: imitation, manipulation, precision, articulation, and naturalization.

e. Relationship between learning domains, levels of learning, and learning objectives. It is important for TNGDEVs to comprehend and consider the three domains of learning (cognitive, affective, and psychomotor), the levels of learning, and the types of knowledge when selecting action verbs for learning objectives. This will assist them in determining the learning objectives desired for a particular target audience. Developmental levels of learning for each taxonomy are slightly different. Bloom's Revised Taxonomy include: remember, understand, apply, analyze, evaluate, and create. The desired learning level dictates the selection of the verb in the learning objective. In using these learning levels, the lesson developer sets the intellectual depth for the content.

f. Table 7-1 depicts an example of the learning levels for the Revised Bloom's Cognitive Domain. TNGDEVs are not limited to the taxonomy or verbs used in table 7-1.

Table 7-1
Learning levels for the Revised Bloom's Cognitive Domain

Levels of learning	Description	Verbs (not all inclusive)
C6 Create	Create a new product or point of view	Assemble, construct, create, design, develop, formulate, write
C5 Evaluate	Justify a stand or decision	Appraise, argue, defend, judge, select, support, value evaluate
C4 Analyze	Draw connections among ideas	Compare, contrast, differentiate, distinguish, examine, experiment, test
C3 Apply	Use information in new situations	Choose, demonstrate, illustrate, interpret, operate, schedule, sketch, solve, write
C2 Understand	Explain ideas or concepts	Classify, describe, discuss, explain, identify, locate, recognize, report, select, translate
C1 Remember	Recall facts and basic concepts	Define, duplicate, list, memorize, recall, repeat, state

g. Learning objective action statements. An action statement begins with a verb and specifies the proficiency or performance expected from completing the learning objective. Regardless of presentation method or media, there is only one verb located in the action statement. The verb selected for the action statement must be compatible to the level of complexity of the action described. Although the action statement verb is an indication of the level of learning expected, looking at the total behavioral statement (action, condition, and standard) will accurately determine the learning objective level of learning, because the same verb may appear in different levels of learning. An example of this is the word “appraise” as it is found at two learning levels of the cognitive domain, analyze and evaluate, as shown in the Revised Bloom’s Taxonomy depicted in Table 7-1.

(1) TNGDEVs must ensure learning objectives fully describe (in action, condition, and standard terms) learner performance, have an observable standard that provides criteria for measuring learning objective performance, and apply sound learning principles that lead to the learner being able to perform critical learning requirements.

(2) TNGDEVs write learning objectives at a level suitable for the content. The Army emphasis is on problem solving, ethical reasoning, judgment, understanding the situation, and critical thinking to develop adaptive Soldiers and leaders. See TP 525-8-2 for training and education emphasis. The desired level of learning dictates the selection of the verb in the action statement and is reflected in the criteria used to measure satisfactory performance. The learning level serves as the controlling mechanism for the entire lesson. If the assigned learning level is analysis, then TNGDEVs measure the assessment at the analysis level.

(3) TNGDEVs ensure that learning objective action statements are the same as, or as close as possible to, the performance demonstrated on the job and/or in career-long roles and functions. TNGDEVs write action statements in terms everyone comprehends.

(4) TNGDEVs select verbs from the learning domain to describe the desired action or behavior in the learning objective action statement.

(a) When designing an action statement that addresses a single individual task, the task title already states the desired outcome. Therefore, the task title may become the TLO action statement. This may help align the desired learning outcome with the appropriate assessment method.

(b) When designing an action statement that addresses knowledge, a skill or an attitude, the knowledge, skill or attitude already addresses the desired outcome and therefore, the knowledge, skill or attitude becomes the TLO action statement. This applies to designing the learning objective action statement for lessons based upon knowledge, a skill or an attitude.

h. Learning objective condition statements. Condition statements set parameters that explain what to provide and what to withhold and may be modified if necessary. They describe the setting or situation under which to teach or measure the objective, as well as the relevant factors associated with desired performance. The condition statement includes environment (for example, in a classroom, simulated combat environment, chemical, biological, radiological, and

nuclear environment, underwater conditions, extreme heat), safety considerations, resources, and constraints. Conditions should be realistic, reflect the job as closely as possible, and be adjusted to the learning environment. (See figure 7-1 for examples of acceptable and unacceptable condition statements.)

When writing a condition statement for a lesson plan, consider the following questions: What are the parameters of what to provide and what to withhold? Does the learning environment require adjustment to operational conditions?	
Rules	Y/N Describes the setting or situation under which to teach or measure the objective? Y/N Is it realistic? Y/N Does the condition statement require revision after the standard statement is written?

Unacceptable

Lesson Plan Title: Unified command suite (UCS) satellite/local television system.

Condition Statement
Using the satellite/local television system in the UCS, in a classroom/field environment.

↑

The above conditions statement does not set the parameters that explain what to provide, what to withhold.

Acceptable

Lesson Plan Title: Unified command suite (UCS) satellite/local television system.

Condition Statement
In a classroom environment/field environment, with a good power source, safety equipment, the satellite/local television system in the UCS, the UCS prime mover, TM-9-2351-230-11 and the UCS SOP, and access to local technicians.

Figure 7-1. Condition statement example

i. Learning objective standard statements. TNGDEVs write standard statements in the present tense. The standards define the action statement and provide the criteria or degree of achievement used to measure whether learners meet the objective at an established baseline. Proponents use standards to teach learners, assess learner performance, provide feedback, and sustain learner performance. All learning objective standard statements start with a verb. Without good standards, a learning objective cannot be determined to be valid or reliable. Figure 7-2 provides an example of an unacceptable and an acceptable standard statement for a task-based lesson plan. Figure 7-3 provides an example of an unacceptable and an acceptable standard statement for a knowledge-based lesson plan.

When writing a standard statement for a lesson plan, consider the following questions: Does it establish the criteria for successful performance of the action? Is it a product standard, a process standard, or is the standard a combination of both?

Rules

- Y/N Is it written in present tense?
- Y/N Does it define the action statement and provide the criteria or degree of achievement used to measure whether learners meet the objective at an established baseline?
- Y/N Does it address anything outside of the conditions?
- Y/N Does it have more than one measurable element?
- Y/N If teaching a task(s), does the standard statement encompass the entire task(s)?

Unacceptable

Lesson Plan Title: Unified command suite (UCS) satellite/local television system.

Standard Statement
Establish connectivity using the satellite/local television system in the Unified Command Suite (UCS) Satellite.

The above example does not describe the quantifiable or qualitative measurements of how well the learner met the learning objective.

This standard statement does not describe what the learner is taught.

Acceptable

Lesson Plan Title: Unified command suite (UCS) satellite/local television system.

Standard Statement
Establish connectivity using the satellite/local television system in the Unified Command Suite (UCS) with a signal strength of at least 85 percent within 10 minutes, in the correct sequence, and without error.

Figure 7-2. Standard statements for task-based lesson plans

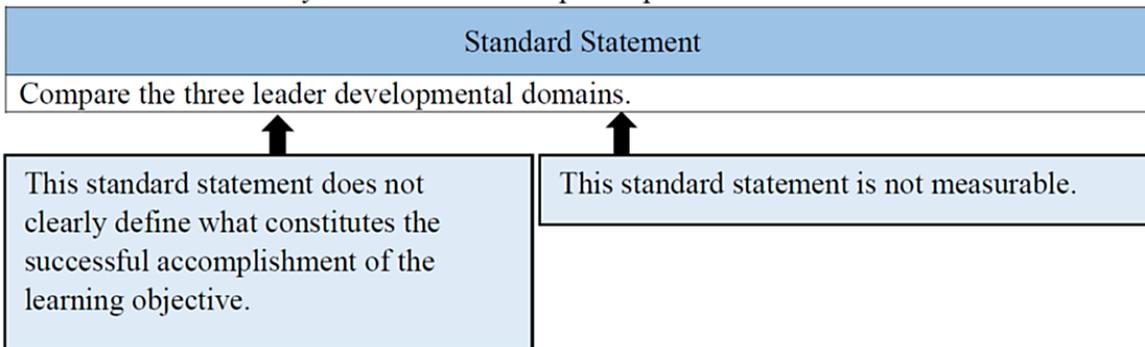
When writing a standard statement for a lesson plan, consider the following questions: How do you determine the degree of mastery? Does it provide the criteria or degree of achievement used to measure whether learners meet the objective at an established baseline? What determines successful completion of the action? Does it identify all specifics? Does each action verb reflect the same level of learning?

Rules

- Y/N Does the standard statement fully describe the learning objectives?
- Y/N Is it assessable using quantifiable or qualitative measurements of how much or how well the learner met the learning objective?
- Y/N Does the standard statement start with a verb?

Unacceptable

Lesson Plan Title: Analyze the leader development process.



Acceptable

Lesson Plan Title: Analyze the leader development process.

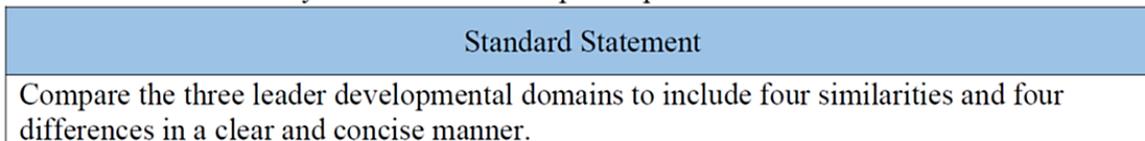


Figure 7-3. Standard statements for knowledge-based lesson plans

(1) TNGDEVs review condition statements to determine the parameters for the standard. The standard cannot address anything outside the parameters set by the condition statement. The condition statement may require revision after the standard statement is written.

(2) TNGDEVs identify all applicable measurable standards. Measuring the performance of the entire learning objective usually requires more than one criterion. The following definitions describe the characteristics associated with standards:

(a) Achievable. Standards that allow for a reasonable expectation of successful completion.

(b) Measurable. Standards that are assessable using quantifiable or qualitative measurements of how much or how well the learner met the learning objective.

(c) Observable. Standards that allow another person to observe performance and achievement of set standards.

(d) Objective. Standards that minimize, to the greatest extent possible, the personal feelings, bias, or interpretation of an evaluator.

(e) Valid. Standards are a measurement of the learning level stated in the learning objective.

(f) Reliable. Standards that consistently measure the accomplishment of a learning objective over multiple iterations.

(g) Usable. Standards that are convenient and practical to execute.

(h) Comprehensive. Standards that provide a complete measurement of a learning objective.

(i) Discriminating. Standards that clearly define what constitutes the successful accomplishment of the learning objective.

(3) Table 7-2 defines the three types of learning objective standards and lists criteria for effective assessment of learner performance.

Table 7-2
Types of learning objective standards

Type	Definition	Recommended criteria
Product standard	<p>Describes the result of the learning to be achieved. Use product standards when the process it takes to perform the learning objective is not important as long as the product (result) is correct.</p> <p>Example (from Task: Construct Individual Fighting Positions). Identify each type of individual fighting position to construct hasty, deliberate, machine gun, and the AT-4 SLM fighting positions. Ensure individual fighting positions provide frontal, side, rear protection, and overhead cover. Prepare a range card for each position.</p>	Accuracy, tolerances, completeness, format, clarity, number of errors, and quantity
Process standard	<p>Describes the critical elements necessary for adequate learning objective performance.</p> <p>Example (from Task: Maintain an M203 Grenade Launcher). Performs all maintenance steps in the proper sequence and demonstrates that the weapon functions properly by performing all steps of the functions check in the proper sequence.</p>	Sequence, completeness, accuracy, and speed of performance
Combination standard	<p>Is a combination of a process and product standard.</p> <p>Example (from Task: Set Headspace and Timing on a Caliber .50 M2 Machine Gun). Set headspace to ensure the GO end of the headspace gauge will enter the “T”-slot and the NO-GO end will not. Set timing for the weapon to fire when recoiling parts are between 0.020 and 0.116 inch out of battery.</p>	Accuracy, tolerances, completeness, format, clarity, number of errors, quantity, sequence, and speed of performance

j. Complete learning objectives. Once the developer understands the components of a learning objective, the next step is to start formulating complete learning objectives. The standard statement is the most difficult part of a learning objective to write. Figure 7-4 provides an example of a complete learning objective based upon a critical task. Figure 7-5 provides an example of a complete learning objective based upon a knowledge.

Action Statement
Assemble an M203 grenade launcher.
Condition Statement
In a classroom environment, while in MOPP 4, given a disassembled M203 grenade launcher, TM 9-1010-221-10, and instruction
Standard Statement
Assemble an M203 grenade launcher in the proper sequence, without error, within four minutes. Perform a functions check on the M203 grenade launcher in the proper sequence, without error, within three minutes.

Figure 7-4. Learning objective example based upon a critical task

Action Statement
Apply the leader development process.
Condition Statement
In a classroom environment, using class lecture, class discussions, reflective thinking, practical exercises, and FM 6-22 and AR 350-1.
Standard Statement
<ol style="list-style-type: none"> 1. List the three critical leadership attributes that are part of the Leader Requirements Model with a maximum of one error. 2. Develop an individual development plan in Army Career Tracker with feedback from the instructor and a prioritized list of four, instructor-approved, individual development needs no later than 30 days after the course start date.

Figure 7-5. Learning objective example based upon a knowledge

7-4. Sequencing lessons and learning objectives

- a. Guidelines for sequencing lessons. Lesson sequencing should be based on the prerequisite relationship among the learning objectives; that is, the order in which the learning objective(s)

should take place. The most obvious sequence follows the order from simple to complex or from general to specific.

b. Guidelines for sequencing objectives. Grouping objectives in a logical fashion promotes efficiency in the course structure. For example, skills (physical and cognitive) and knowledge generally need progressively more complex and controlled media and facilities. Logical grouping reduces the time between the instructions of dependent objectives. TNGDEVs may use various criteria for selecting sequencing logic. Examples include sequencing by subtasks, by time requirement, by most to least important task, by the order in which the tasks must be performed, and by easiest to the most difficult to accomplish. Table 7-3 provides a more complete list of objective order.

Table 7-3
Learning objective to lesson relationship

Relationship	Example
Job performance sequence	Actions having a prescribed sequence, such as assembly and disassembly of a weapon or loading a tank's main gun.
Chronological sequence	Actions required for planning time relationships of events, such as identifying chemical agents using the M258 kit, where the learner must analyze samples at specific times during the process to determine agent type.
Cause and effect sequence	Actions required to achieve a desired effect, such as properly utilizing demolitions (cratering charge or abatis) to block a road. Use of this technique demonstrates how improper actions can have a negative effect, such as how poor driving habits can lead to accidents.
Critical sequence	Tasks requiring an important action, such as "clear weapon before starting disassembly."
Simple-to-complex sequence	Tasks requiring simple task performance in order to master complex tasks, such as learning to use a compass and read a map before conducting land navigation.
Complex-to-simple sequence	Tasks requiring comprehending the existence of a complex structure in order to give meaning to the mastering of the simpler actions supporting the task. An example is learning and understanding the overall MDMP before conducting the individual steps of the process.
Known-to-unknown sequence	Military commercial vehicle maintenance precedes maintenance of lesser-known military specific vehicles.

c. Sequencing for efficiency. Another rationale for sequencing instruction is the most efficient use of resources, particularly time. An example is instructing objectives concurrently if performing them sequentially would require additional or extensive facility/training site preparation. TNGDEVs must achieve a balance between the requirements for effectiveness and avoiding excessive costs.

7-5. Lesson design

Lesson design establishes the optimal instructional strategy for each individual critical task and supporting knowledge, skills or attitudes identified in associated analysis data. Lesson design translates each individual critical task, knowledge, skills or attitudes into a learning objective.

a. Lesson design approaches. There are two basic approaches to lesson design. One approach is to design lessons based on approved individual critical tasks taken from the ICTL. The second approach is to design lessons based on a knowledge, skill, or an attitude. This can also be done for a course with approved educational outcomes. Although there are common elements to the two approaches, there is a difference. In the case of courses with approved educational outcomes, the TLO may be at the course/module level or even at the lesson level. Centers/schools have latitude as to which lesson design approach they will use based on their course design.

Note: knowledge, skills and attitudes must begin with an action verb and have a direct object.

b. Lessons with TLOs based on individual critical tasks.

(1) In general, the task action and standard statement become the lesson TLO action and standard statements. Instructors teach all performance steps and measures of the task to standard in the lesson as either ELOs or LSAs. The standard for task performance may also be the standard for assessment; however, there may not always be a one-to-one correspondence. The termination aspect of the lesson learning objective indicates that a lesson covers all components of the individual critical task and the assessment of the TLO verifies the learner's ability to perform this task. Chapter 11 provides information on assessments.

(2) Depending on the complexity of the individual critical task, proponents may choose to design lessons with a learning objective that supports different elements (knowledge, skills, attitudes or performance steps) of one or more individual critical tasks. Figure 7-6 depicts ways to design learning objectives.

(a) Task(s) taught. A task taught completely trains the task to standard in a lesson or results in the completion of training of the task to standard within the course. It trains the remaining knowledge, skills, attitudes or performance steps of the task supported in previous lesson(s) within the course. When developing a lesson that lists more than one individual critical task as taught, TNGDEVs ensure that all tasks taught together are associated with one another. When developing a lesson with multiple tasks listed as taught, TNGDEVs ensure that the learning objective is broad enough to account for all the tasks listed as taught.

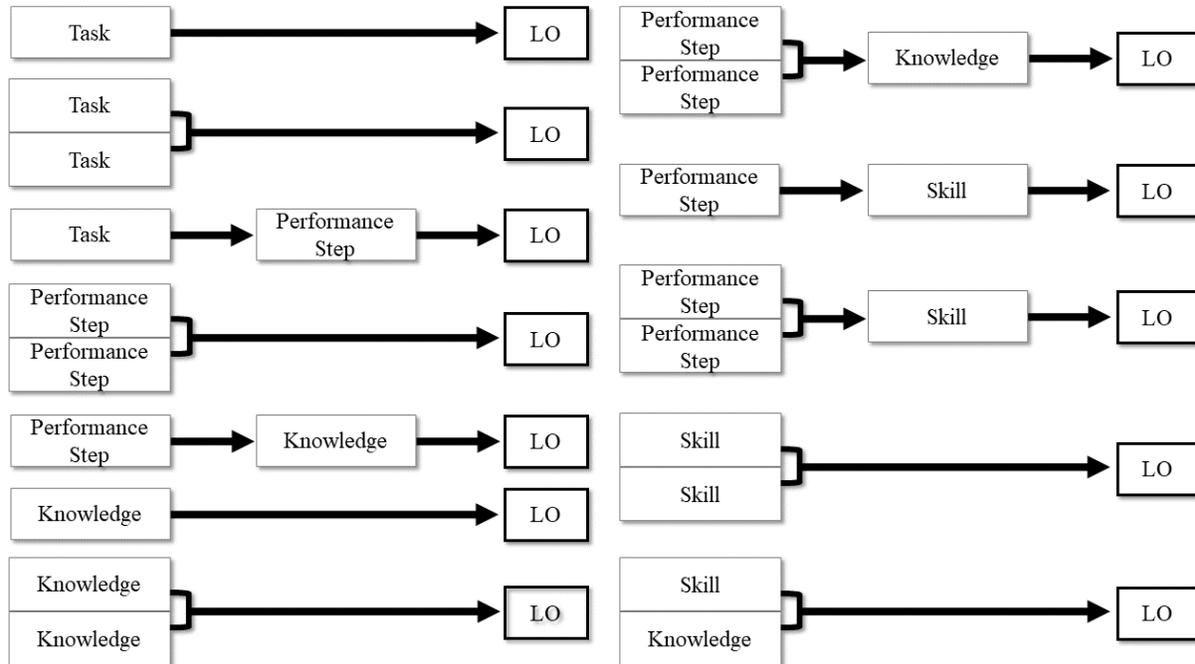


Figure 7-6. Ways to design learning objectives

(b) Task supported. A task supported is used when not all knowledge, skills, attitudes or performance steps in the task are taught in the lesson. The rest of the task is taught in another lesson or across other lesson plans. When the learning objective of a lesson only covers part(s) of an individual critical task, proponents must address any remaining elements in another lesson(s).

c. Lessons based on a knowledge, a skill, or an attitude in a course with approved educational outcomes. The TLO may be at module, course, or lesson level, based on course design. A lesson may address ELOs that support more than one TLO when TLOs are located at the module or course level. This is an example of the threading process illustrated in figure 6-1. The ELOs outline the steps necessary for a learner to acquire new knowledge, skills and attitudes, leading to the performance stated in each TLO. A lesson supports one TLO when the TLO is at the lesson level.

7-6. Lesson design guidelines

a. Follow the guidelines below to create a quality lesson outline.

- (1) Design the lesson based on sound learning principles.
 - (a) Ensure the design is consistent with the analysis data.
 - (b) Write the learning objective(s) correctly and sequence them appropriately.
 - (c) Ensure the full specification of the conditions.
 - (d) Develop LSAs that support the learning objectives.

- (e) Ensure learning is feasible and cost effective.
 - (f) Ensure the learning sequence is effective and the learning is sequential and progressive.
 - (g) Select appropriate measures of learner performance for each TLO.
- (2) Ensure the technical accuracy of the contents.
 - (3) Identify and correct all deficiencies.
 - (4) Incorporate safety, risk, and environmental factors and considerations.
 - (5) Limit the length of the lesson to an amount of time appropriate for sound instructional design.
 - (6) Design the lesson to encompass only related tasks when addressing multiple tasks in a lesson.
- b. Create the lesson outline to focus the lesson and serve as the framework for the lesson plan. A detailed lesson outline for a task-based lesson includes the lesson title; number; the task taught, task supported, and/or task reinforced; the learning objectives (TLO and ELOs); and the LSAs (in the required sequence). For a knowledge, skills or attitudes-based lesson, the lesson will include the lesson title; number; and the knowledge, skills or attitudes taught as well as the learning objectives (TLO and ELOs); and the LSAs (in the required sequence).
- (1) Include and sequence ELOs/LSAs (if used) as necessary.
 - (2) Establish how to assess learner performance of the learning objectives. Write assessment/test items that match the action, conditions, and standards of the learning objective(s). Create the draft assessment tool during the design phase of ADDIE. (See chapter 11 for more information on assessment and tests.)
 - (3) Include LSA specifications and reinforcement learning requirements. Sequence the steps/activities to provide for sequential/progressive learning.
- c. Consider the lesson design complete when the appropriate proponent command authority approves it for development.

7-7. Learning step activities

LSAs are the foundation for a lesson. They begin with a verb and they have a direct object. They provide a structured means to focus learning on a small part of what a learner needs to learn, and provide the basis for identifying specifications, including such items as the MOI and resources required to present the lesson. When MOIs change, new LSAs must be created.

- a. Design the lesson to ensure each LSA and assessment is based on a learning objective and include supporting knowledge, skills and attitudes. (See table 7-4 for LSA examples.)

Table 7-4
Learning step activity examples

If the method is:	Then the LSA would have the learner:
Role play	<ul style="list-style-type: none"> • Act out a specified situation.
Discussion	<ul style="list-style-type: none"> • Analyze a specific subject or situation. • Discuss a specific subject or situation. • Describe a specific subject or situation. • Identify a specific subject or situation.
Demonstration	<ul style="list-style-type: none"> • Participate in the demonstration. • Observe the demonstration.

b. Design LSAs to support each learning objective and sequence them to maximize learning. Assign numbers (LSA 1, LSA 2, and others) using TDC. See appendix E for an LSA sequencing example. Do not develop LSAs for a lesson that does not directly support a learning objective.

c. Design the LSAs that may have with mandatory time requirements (for example, due to task performance standards).

d. Conclude the lesson design phase by creating an outline of each LSA that supports the learning objective.

7-8. Developing learning step activities

Development of the LSAs includes identifying the resource requirements for LSA specifications. Table 7-5 lists resource requirements to consider during LSA development. If the resource requirements do not change from LSA to LSA, resources should be addressed at the TLO level.

Table 7-5
Resource requirements for learning step activities

Resource	Actions
Equipment	<ul style="list-style-type: none"> • List instructional aids needed to accomplish instruction (equipment, weapon systems, tools, trucks, etc.). Provide specific nomenclature and quantity requirements. State if there are none. <p>Identify equipment-to-instructor and equipment-to-student ratios.</p>
Materials	<ul style="list-style-type: none"> • List required reading for instructors/facilitators. List materials required for instructors/facilitators that do not fit under the preceding section. These are materials that instructors/facilitators and learners must have (maps, compasses, forms, etc.). List civilian reading materials by type, title, author, page numbers, date of publication, and publisher. Provide an Army source with complete mailing address, phone number, e-mail, and other required information to obtain any civilian materials listed. • Identify materials-to-instructor and materials-to-student ratios.

Table 7-5
Resource requirements for learning step activities, cont.

Resource	Actions
Supplies	<ul style="list-style-type: none"> • Identify any supplies needed to conduct the LSA. Include those needed by instructors/facilitators and learners (paper towels, rags, pencils, tablets, calculators, etc.). • Identify supplies-to-instructor and supplies-to-student ratios.
Student handout requirements	<ul style="list-style-type: none"> • Identify any handouts that require printing versus providing them online. • Identify length of time to print, number needed per course, and cost of printing.
Operational tempo (OPTEMPO) requirements	<ul style="list-style-type: none"> • Identify the operating miles or hours estimated for each equipment item or system required to teach this LSA. Factor the required equipment operating miles or hours into lesson and course costs, once the POI is submitted for validation. Base this on the OPTEMPO cost factors applied via the individual training resource model automated system (See TP 350-70-9).
Ammunition	<ul style="list-style-type: none"> • Identify the ammunition requirements to teach this LSA. State if there are none.
Learning environment/classroom requirements	<ul style="list-style-type: none"> • Identify all the requirements for the location where the instruction will take place. Include size requirements as well as universal stock numbers, as appropriate.
TADSS	<ul style="list-style-type: none"> • Identify the identification number of each training aids, devices, simulators, and simulations (TADSS) item used to teach the LSA, if applicable. • Identify the title of the TADSS. • Identify the TADSS-to-student ratio and include the instructor/facilitator requirements.
Supporting personnel requirements	<ul style="list-style-type: none"> • List the number of instructors/facilitators, demonstrators, and/or assistant instructors/facilitators required to teach the LSA. <i>Note.</i> TDC matches ICHs to LSAs for resourcing. • Identify any special qualifications (certifications, skills, knowledge, attitudes, behaviors, etc.) instructors/facilitators must possess. • Identify any additional support personnel and their qualification requirements (such as bus drivers, audiovisual equipment operators, range operators, etc.).
Additional resources	<ul style="list-style-type: none"> • Compile and include total resource requirements in appropriate training plans, lesson plans, POIs, and TSPs. Identify any additional resource requirements such as opposing forces (OPFOR) and role players to support implementation.

7-9. Lesson numbers

a. Every lesson requires a number and title. During the design phase of ADDIE, TNGDEVs create lesson plan outlines with numbering and titling. Discussion of lesson titles is in paragraph 7-10.

b. A coherent and systematic method for numbering lessons is required to manage the digital storage and retrieval of lessons. This enables proponents to search, locate, and share lessons effectively and efficiently.

c. The format for lesson numbers is PPPP-NNNNNNNN. The first four spaces are for the proponent school code; the code may not require the use of all four spaces. The second field of eight numbers/letters provides a unique lesson identifier. The lesson number format allows for effective and efficient search capability for schools and centers that need that lesson.

(1) Make the lesson number noticeably similar to the task number when converting an individual task directly into a lesson to improve database search capability. In cases where the lesson teaches more than one task this may not always be possible.

(2) Ensure the lesson number reflects the task number when converting a common core task into a lesson (for example, task number 805C-COM-2472). In this example, the COM is an abbreviation for common task/core. See figure 7-7 for lesson numbering examples related to a task.

Individual Task Number (3 fields)	Lesson Number (2 fields)
	PPPP = Proponent School Code (up to 4 spaces) NNNNNNNN = Unique alphanumeric designation (up to 8 spaces)
171-137-0001	171-1370001
805C-COM-2472	805C-COM2472

Figure 7-7. Lesson numbering example for lessons based upon individual critical task or a common core task

(3) When developing a lesson plan based upon a knowledge, skills or attitudes, in a course with educational outcomes. Since there is no individual task number, the lesson number would not reflect a task number. The lesson number includes the proponent code and the unique alphanumeric designation (up to eight spaces) assigned by the proponent for that lesson.

d. ELOs are numbered in compliance with the following guidelines:

(1) Assign only letters (ELO A, ELO B, and others) when the ELO supports a TLO at the lesson level.

(2) Show the linkage of ELOs that link directly to a course/module-level TLO by using the number assigned to the course/module-level TLO. For example, if the course/module TLO number is TLO 12, the associated ELOs would be ELO 12A, ELO 12B, and ELO 12C, and others. Use the lesson number format shown in figure 7-8 as an example for lessons that support or progress to a course/module-level TLO. See figure D-2, for examples of TLO to lesson crosswalk.

TLO	TLO Action Statement	ELO	ELO Action Statement	Lesson #/Version #/Title
TLO-12	Apply the steps of the leader development process	ELO-12A	Identify attributes and competencies (ends Leader Requirements Model).	701-L020/V1.0/Leader Development Doctrine
		ELO-12B	Explain the Leader Development Model (ways/ institutional, operational, self-development, including career map).	
		ELO-12C	Plan self-development (Leader Development Improvements Guide, individual development plan (IDP), Leadermap App).	
		ELO-12D	Plan counseling.	701-L070/V1.0/Principles of Developing Others
		ELO-12E	Implement team building.	
		ELO-12F	Explain the evaluation reporting system.	

Figure 7-8. Lesson numbering examples for lessons that support course/module-level terminal learning objective

e. The protocol for lesson version/edition numbering is described below:

(1) Establish the original lesson version and edition number as 1.0. The lesson version number can also be the FY, for example, FY 2018 is 18.0.

(2) Change the entire version number when there is a resource change. For example, the original lesson version number would change from 1.0 to 2.0. See TP 350-70-9.

(3) Indicate the change using the edition number when only making a minor change and there is no change in resources. The edition number is the second digit in the version number. For example, if the original lesson version 1.0 has a minor change, the edition number becomes 1.1. The next minor change would be edition 1.2, and so forth. Minor changes should start over after nine, and the edition would change to the next number. For example, if the version is 2.9, the next edition/version should be 3.0. See figure 7-9 for version and edition number protocol.

(4) Minor changes after the ninth edition will be considered a major change even if resources are not affected. Major changes will always be a whole number. As an example, baseline version 1.0 has been locally changed nine times, making the current version 1.9. The next change, whether minor or major, will trigger an immediate whole number change to version 2.0, which must be submitted for validation (again). Version numbering does not apply to resources changed using the shared lesson function of TDC.

Version Fields	Version Number Examples
Whole number + decimal + whole number	Version example: 1.0
Version with edition change	Version one, edition one: 1.1

Figure 7-9. Version/edition number protocol

7-10. Lesson titles

The lesson title describes the object, subject, or focus of the lesson. The lesson title must provide complete clarity when read. Following the rules listed here will greatly improve database search capability, and strengthen the relationship between the lesson title, the individual task or groupings of related tasks, or the knowledge, skills or attitudes. Figure 7-10 provides a lesson title based upon an individual critical task title. Figure 7-11 is an example of how groupings of related tasks become a lesson title. Figure 7-12 is an example of how a knowledge becomes a lesson title. When converting an individual task, groupings of related tasks, knowledge, skill or attitude directly into a lesson, the lesson title uses the subject found in the task, the knowledge or the skill.



Individual Task Title (verb and subject)	Lesson Title (subject only)
Maintain an M203 Grenade Launcher	M203 Grenade Launcher

Figure 7-10. Lesson title example based on single individual critical task



Individual Task Titles (verb and subject)	Lesson Title (subject only)
Load an M4 Series Carbine Zero an M4 Series Carbine Engage Target with an M4 Series Carbine Unload an M4 Series Carbine Maintain an M4 Series Carbine	M4 Series Carbine

Figure 7-11. Lesson title example based on grouping of related tasks



Knowledge	Lesson Title (subject only)
Explain Information Exchange in Joint Operations	Information Exchange in Joint Operations

Figure 7-12. Lesson title example based upon a knowledge

7-11. Lesson plan development

a. After approval of the lesson design, proponents develop the lesson plan, to include all the details required for the presentation. Sometimes it is possible to conduct lesson design and lesson development functions simultaneously. This approach requires care to ensure the lesson builds on and reinforces previous learning as appropriate. The design and development must provide for vertically aligned learning that builds to a higher skill/proficiency level and reinforces previous learning as necessary.

(1) A lesson plan is a detailed description of learning content (the lesson), IAs, and assessment(s) associated with instruction to achieve a learning objective. Lesson plans should use a standardized structure that promotes sharing between schools, centers, and instructors.

(2) Lesson plans are critical components of the course development process. A basic lesson plan supports the lesson content and ensures the overall efficiency and effectiveness of the lesson. The lesson plan organizes the administrative data and resources for what, when, and how to present the material. The lesson plan communicates the intent of the lesson and guides the instructor/facilitator on how to implement the instruction. Lesson plans are written from the instructor/facilitator's viewpoint. Where appropriate, the lesson plan may include notes to provide adequate how-to information for a substitute instructor. The notes are inserted as a separate paragraph in the lesson body where the event should take place.

b. The lesson plan identifies other lesson requirements including the introduction, content, summary, and appendices. In line with the ALM and adult learning concepts, the lesson plan should contain a short motivator. The motivator is generally included at the beginning of the lesson and may be part of the instructional lead in, warm-up pre-exercise, or separate LSA. In The ArmyU Experiential Learning Model (ELM) lesson plan, the concrete experience is the motivator. For more information on the ELM lesson plan see appendix G. The motivator serves the following purposes:

- (1) Triggers experience and knowledge.
- (2) Provides relevance and significance to the lesson.
- (3) Gains learner interest and focuses them on what they are about to learn.

(4) Explains why the learner needs to perform the learning objective and the consequences of nonperformance.

(5) Explains the actual job or operational environment that would make learning the objective essential for the learner.

(6) May not apply to some lesson plans in IMT courses. While IMT Soldiers are inexperienced in a military context, use of a motivator to trigger experience and knowledge can still be used to support the military lesson they are about to learn. This is consistent with adult learning, as IMT Soldiers often have life experience and knowledge that may be relevant to the “new” military concept or skill.

c. The lesson plan includes administrative and resource data identified in the design and development of the LSAs. Lesson plan development requires, at a minimum, entering the following information for the LSAs in the TDC lesson plan format:

- (1) Modes of instructional delivery.
- (2) Instructional strategy and MOIs.
- (3) Instructor-to-student ratio (ISR).
- (4) Lesson academic hours.
- (5) ICHs.
- (6) IAs.
- (7) Media.
- (8) Media delivery.
- (9) Resources required.
- (10) Measure of learner performance: assessment.
- (11) Administrative data.

d. COEs/schools and institutions may develop and use a lesson plan document produced outside of TDC by following the guidance and procedures outlined below. This applies to all Army training and education proponent organizations that produce Army learning products. The TDC-generated lesson plan record and the externally developed lesson plan document will be considered a complete lesson plan when, together, they meet all requirements outlined in (1) through (8).

(1) The externally produced lesson plan document must contain all necessary information and learning content details to support the conduct of the instruction. Proponents may use this in lieu of a TDC-compiled lesson plan report or trainer's lesson outline. As such, the attached lesson plan document serves as the instructor/facilitator guide or trainer's lesson outline for conducting the lesson. It must provide guidance appropriate for a new course certified instructor to execute the learning activities properly; simply attaching slides or a general outline is not acceptable.

(2) The COE/school enters the required information into TDC. If the COE/school opts to use an externally produced lesson plan document, they must upload/attach it to the data record in TDC.

(3) COEs/schools and institutions must develop and maintain the same lesson plan product structure in TDC as the lesson structure of the externally produced lesson plan (TLOs, ELOs, LSAs, and practical exercises). This is to associate and account for resources (for example, MOIs, ISRs, materiel items, facilities, TADSS, Department of Defense Identification Code to each learning objective.

(4) COEs/schools and institutions must maintain strict version and edition control of learning products, pursuant to established policy.

(5) COEs/schools and institutions ensure the externally produced lesson plan document contains the following lesson elements for the lesson plan to be relevant and useful for the instructor/facilitator/trainer to deliver the instruction.

(a) The attached/uploaded lesson plan must be dated.

(b) The title, lesson plan number, and version of the attached/uploaded lesson plan must match the fields in TDC.

(c) The lesson plan should contain a general framework that includes the following:

(1) An introductory statement covering the learning objective (action, condition, and standard), a description of the assessment, and expected learning outcomes must be included. It must meet regulatory requirements, proponency, and sound lesson plan design. The learning domain level must be stated below the standard statement, similar to how it is formatted in TDC.

(2) The lesson plan must include a narrative, outline, or script containing the detailed information, learning content, and the activities for conducting the lesson. The detailed information includes the LSAs' description and text, a review or summary, and appropriate checks on learning. If applicable, the detailed information includes any/all practical exercises in the lesson plan.

(3) A motivator should be provided in the lesson plan attachment.

(4) The instructor materials (such as slides, training aids, and/or handouts) must be attached or uploaded to TDC.

(5) An assessment activity or assessment plan, specific to the learning objective, must be in TDC.

(d) Learner requirements (such as advance sheets and reading materials) must be attached/uploaded to TDC.

(e) If using a lesson plan attachment, all learning content must be in the attachment for the instructor's use and uploaded to TDC.

(6) The document structure and paragraph headings cross-reference with the corresponding record in the database and help to maintain lesson integrity. This facilitates database searching and provides a contextually relevant instructor/facilitator guide.

(7) The administrative information and resourcing data in the lesson plan are entered into the lesson data record in TDC. Linking the TDC generated lesson plan to its supported and/or related products supports the resource compilation and maintains database functionality.

(a) TNGDEVs upload/attach the lesson plan document to its corresponding TDC lesson plan, prior to submitting the lesson plan for approval and QC reviews. After the lesson plan is uploaded/attached, it is marked as a presentation or handout so that the instructor receives notification. TNGDEVs should also annotate in the LSAs that the learning content is attached/uploaded as a separate document.

(b) The proponent notifies all lesson plan users when there are changes to the attached/uploaded lesson plan if the lesson is a shared lesson or is linked by another COE/school.

(c) Proponents ensure the classification, FD, and distribution restriction selections are the same in the uploaded/attached lesson plan and in the TDC lesson plan record.

(d) If centers/schools are making resource or significant changes to the lesson, the original lesson number is retained in the database, and then the old attached lesson plan document is superseded. The version code on both the TDC lesson plan product and the attached lesson plan is updated, and the new version of the externally produced lesson plan document is uploaded/attached.

(8) Development and use of a lesson plan attached/uploaded to the TDC lesson plan product will support agility and reduce some of the redundancy that slows the production process. When making changes to lesson plans that do not affect resources, use an attached/uploaded lesson plan when the COE/school maintains version and edition control. The producing a lesson plan outside of TDC JA is available on the TED-T website.

7-12. Modes of instructional delivery for lessons

a. During the development of lesson plans, TNGDEVs must take into consideration that the course design may have created modules and/or phases to allow the instruction to be provided via different delivery options. The three primary modes of lesson delivery are face-to-face, online, and blended. A primary consideration for the mode of instructional delivery of lessons is the need for physical, verbal, and visual interaction between the learner and instructor.

b. TNGDEVs produce the products listed below for delivery during lesson plan development. These primary products include but are not limited to the following:

(1) Approved lesson plan(s) for instructor/course manager use (if available).

(2) Approved self-paced lesson and supporting media/materials for learner use (for example, correspondence course or IMI).

(3) Home study and other learner assignments ready for issue to the learners in support of instructor-led instruction, including practical assignment sheets, student handouts, and home study assignments.

(4) Media products ready for use (for example digital slides or video).

(5) Assessments and tests.

(6) Practical exercise guidance.

c. TNGDEVs add as much detail as needed to allow for the following conditions:

(1) Any new or substitute instructor can use the lesson plan with no degradation of training and with minimum preparation time.

(2) Any learner can meet the learning objective standard for a self-paced lesson (for example lesson for correspondence course, programmed text, or IMI) without the assistance of an on-site instructor.

7-13. Instructional strategy and methods of instruction

a. An instructional strategy helps organize and specify the learning activities, MOIs, and content delivery. The strategy includes pre-instructional activities, presentation of information, practice and feedback, assessments, and follow-through activities. Instructional strategies emphasize concepts, theories, relationships, ideas, and generalizations. Instructional strategies are designed to achieve the overall goal of imparting knowledge using particular MOIs. The MOI is a type of activity used to facilitate the accomplishment of a learning objective.

b. The ALM calls for outcome-oriented instructional strategies that foster critical thinking and initiative, provide operationally relevant context, and best fit the learning audience and range of

desired outcomes. Selection of an instructional strategy will influence the MOI, media selection, resourcing, ICHs, IAs, and the time of instruction. Any instructional strategies selected must align with available instructor/facilitator resources, target audience analysis, command guidance (for example, use of ALM), and learner throughput requirements. The five primary instructional strategies that support the ALM are described below.

(1) Direct instruction. Direct instruction is often through instructor/facilitator-led lecture with explanations, examples, and opportunities for guided practice and targeted feedback to enhance retention and transfer of learning. See TR 350-70 for a description of feedback and types used in an education/training environment. Direct instruction can be an efficient and effective method to teach factual information, rules, and procedures for which there is one right answer, and for which that answer is relatively simple. This strategy emphasizes the use of carefully sequenced steps, so the learner can master a new fact or rule before moving on.

(2) Independent study. Independent study is a learning experience that is supervised and controlled by a specialist in the subject but allows learners to study an agreed-upon subject autonomously. Independent study (often referred to as directed study) shifts the responsibility for learning from the instructor/facilitator to the learner. It is frequently used when a learner and a teacher agree upon a subject for further learning.

(3) Indirect instruction. Indirect instruction influences the learner to construct knowledge rather than learning material from an instructor. The learner-constructed response differs from the content used to present the material and any previous response. As with independent study, indirect instruction shifts responsibility for learning from the instructor/facilitator to the learner. (See Table 7-6 for instructional strategy uses with suggested MOIs.)

Table 7-6
Instructional strategy uses with suggested methods of instruction

Instructional strategy	Uses and suggested MOIs
Direct instruction	<p>Uses: This strategy is most effective at teaching knowledge acquisition involving facts, rules, and action sequences.</p> <p>Suggested MOIs: Compare and contrast, demonstration, drill and practice, guided reading and thinking, lecture, structured overview, and tutorial.</p>
Independent study	<p>Uses: This strategy generally involves research outside of a school setting for an agreed-upon amount of credits. It can be self-paced and can overcome geographical barriers.</p> <p>Suggested MOIs: IMI, tutorial, and writing assignments.</p>

Table 7-6
Instructional strategy uses with suggested methods of instruction, cont.

Instructional strategy	Uses and suggested MOIs
Indirect instruction	<p>Uses: This strategy is used best when presenting concepts, abstractions, or patterns, and when the learning process is inquiry-based, the result is discovery, and the learning context is a problem. Instruction helps learners develop content organization, inductive and deductive reasoning, personal experience(s), and group discussion skills.</p> <p>Suggested MOIs: Brainstorming, case study, concept mapping, inquiry, problem solving, reflective discussion, tutorial, and writing assignments.</p>
Collaborative/interactive instruction	<p>Uses: Learners learn from peers and instructor/facilitators to develop social skills and abilities, organize their thoughts, and develop rational arguments. This strategy allows for a range of groupings and collaborative/interactive methods. Collaborative/interactive instruction requires the refinement of observation, listening, interpersonal, and intervention skills and abilities by both instructor/facilitator and learners.</p> <p>Suggested MOIs: Brainstorming, cooperative learning groups, debates, discussion (small or large group), interviewing, laboratory groups, panels, peer partner learning, problem solving, role playing, seminar, tutorial.</p>
Experiential learning (using the ELM)	<p>Uses: The emphasis in experiential learning is on the process of learning and not on the product. Experiential learning helps to develop inductive reasoning, analysis, personal reflection, ability to formulate plans, speaking and writing, and lifelong learning attitudes.</p> <p>Suggested MOIs: Case study, conducting experiments, field observations, field trips/site visits, gaming, model building, practical exercises (hands-on/written), role playing, simulation, and storytelling.</p>

(4) Collaborative/interactive instruction. Collaborative/interactive instruction relies heavily on discussion and sharing among participants. It is important for the instructor/facilitator to outline the subject, the amount of discussion time, the composition and size of the groups, and reporting or sharing techniques. The success of the collaborative/interactive instructional strategy and its many methods is primarily dependent upon the expertise of the instructor/facilitator in structuring and developing the dynamics of the group.

(5) Experiential learning. Inductive, learner-centered, activity-oriented, personalized reflection about a learning experience and formulation of plans to apply learning to other contexts are critical factors in this strategy. Experiential learning is a cycle consisting of five necessary phases. These phases are concrete experience (a trigger of experience and knowledge), publishing and processing (reactions and observations are shared), generalizing new information

(GNI) (focuses on content and methodology), developing (learner-centric focusing on how the lesson will be valuable to the learner), and applying (plans are made to use learning in new situations).

(a) Converting most classroom experiences into collaborative problem-solving and application activities encourages learners to think and helps them understand the relevance and context of what they learn. Instructors are also encouraged to use blended learning approaches that incorporate simulations and gaming to provide realistic training and to assess learners' abilities to apply their knowledge in real-world settings. The key for lesson development is that the lesson plan must contain sufficient detail regarding the five phases of experiential learning to help the instructor/facilitator to enable the learning process.

(b) The ELM emphasizes the process of learning, not the product. Experiential learning helps to develop inductive reasoning, analysis, personal reflection, ability to formulate plans, speaking and writing, and lifelong learning attitudes. Appendix G provides a detailed explanation of the ELM five steps. The ELM instructional strategy may apply to task-based lessons or lessons based upon knowledge, skills or attitudes that is taught in courses with educational outcomes. (See TED-T website for an example of a lesson plan that uses ELM.)

c. The MOI is a component of the instructional strategy used to facilitate the accomplishment of a learning objective(s). The MOI is commonly associated with each LSA. Appendix F provides an example of cross-walking multiple MOIs and LSAs in support of a learning objective. Selection of the MOI requires consideration of the learner, the content, the goals, the learning environment, the instructor/facilitator, and the available resources. Specific MOIs require varying degrees of learner participation. While particular methods are often associated with certain strategies, some methods function across a variety of strategies. The primary uses and suggested MOIs used with each instructional strategy appear in table 7-6. Appendix F further discusses and defines the MOIs noted in table 7-6. (See chapter 7-14 for instructor-to-student ratio and instructor requirements.)

a. Determine the ISR based on the MOIs and delivery techniques. The proponent establishes the ISR for each learning step activity in a lesson. This is recorded in TDC and published in the POI. Accuracy is important because the ISR is one factor used to calculate instructor/facilitator requirements. For problem-based, learner-focused courses, as described by the ALM, strive for ratios of one instructor to 1/2, 1/3, or 1/4 the size of the optimum course size. For an optimum class size of 32, ISRs would be 1:16, 1:11, or 1:8. Table 7-7 contains factors to consider when establishing ISRs.

Table 7-7
Instructor-to-student ratio factors

Factor	Examples
Restrictions imposed by equipment	<ul style="list-style-type: none"> • The interior of a tank limits the number of personnel that can be inside of the tank during instruction. • The noise of a generator limits the ability of students to hear the instructor/facilitator's voice.
Safety factors	<ul style="list-style-type: none"> • Teaching self-contained underwater breathing apparatus divers in a dive tank may require one instructor/facilitator per two students (1:2). • Teaching a Soldier to throw a live grenade requires one instructor/facilitator per student (1:1).
Regulatory ratios	<ul style="list-style-type: none"> • TP 350-70-9 provides guidance on ISRs for courses and instructional design. TP 350-70-9 covers how to determine the most restrictive ISR for RC schools.
Facility limitations	<ul style="list-style-type: none"> • A classroom may be limited to 20 seats (1:20) or justification is required for additional instructors/facilitators for practical exercises. • A classroom may have electrical and/or network wiring limitations, etc., that limit use of the classroom to designated numbers of students for certain types of instruction. For example, a classroom with 20 network jacks can only support 20 devices for simulation or gaming instruction (1:20).
Equipment ratios	<ul style="list-style-type: none"> • Equipment-specific ratios must be approved by a TRADOC review of manpower (TP 350-70-9).
Instructor limitations	<ul style="list-style-type: none"> • Instructor span of control is based on instructor ability to manage the class size and/or provide ample feedback to the students in attendance.
<i>Note.</i> TOMA validates the ISR published in the POI and lesson plan.	

b. List instructor/facilitator requirements. Include the number of instructors that are required to instruct a task or learning objective. Identify any specific qualifications the instructors must possess (for example, instructor MOS, skill(s), certifications, and other special qualifications). See TR 350-70 and TP 350-70-3 for additional information regarding instructor/facilitator qualification and certification.

7-15. Lesson academic hours

Lesson length should be denoted in academic hours. An academic hour is a 60-minute time block consisting of 50 minutes of instruction and ten minutes of administrative/break time. Lesson length is the sum of the LSA's time of instruction in minutes but does not include administrative time. As an example, if the lesson length is 100 minutes, it will take two academic hours to complete.

7-16. Instructor contact hours

ICHs capture the instructor's work hours when they are with the students formally executing the POI lessons. Proponents base ICHs on the academic hours and ISRs. Each course POI precisely documents ICHs against each lesson within the POI. The ICHs represent the time that an

instructor or multiple instructors are present with students during a formal lesson and are presenting curriculum and/or executing a training event. In other words, ICHs are a function of the classroom time of the course. (The term “classroom” in this sense may include external training areas or ranges.) ICHs do not capture the actions that instructors must do before or after a training event to ensure and enable the successful execution of that event.

7-17. Instructor actions

a. IAs are categories of work performed by instructors that are requirements-producing and documented in the POI. IAs are based on time and ISRs, and are documented just as ICHs are documented. IAs capture the instructor’s work hours when he/she is not with the students formally executing the POI lessons. To qualify as an IA, an instructor task must meet the following criteria:

- (1) POI driven.
- (2) POI specific.
- (3) Performed during every execution of the POI.
- (4) Not duplicative of tasks/hours that earn ICH credit.
- (5) An appropriate task for an instructor to perform.
- (6) Quantifiable.

b. Listed below are examples of valid IAs:

- (1) Classroom setup and breakdown.
- (2) Conduct of pre-entry assessment.
- (3) Conduct of remedial instruction and assessments.
- (4) Grading assessments.
- (5) Student counseling.
- (6) Evaluating student written assignments.

c. IAs are documented within the POI at the lesson plan level by TNGDEVs with SME input from instructors and/or course managers. Entered in the POI are both the time required and the number of instructors involved. Number of instructors is in the ISR field. Additionally, TDC provides a text box so that the nature of the IA and the time required may be explained/justified if necessary.

d. The following instructor duties represent non-course work and must not be documented as IAs:

- (1) Actions related to the instructor certification process.
- (2) Supervision of subordinate instructors/other personnel.
- (3) Command-related duties.
- (4) Personnel actions.
- (5) Contributions to the training development community.

e. While all of the above duties may represent legitimate work for instructor personnel, they are not part of instructor performance in the routine execution of a POI; therefore, it is not appropriate to document them as IAs. IAs should be restricted to actions performed in the same manner during every execution of the POI, and which directly support the execution of the lesson plans for that POI. Non-course work for instructors (such as the examples cited immediately above) is recognized and credited within the instructor requirements model (IRM).

f. Tips to avoid mistakes when documenting IAs within lesson plans in TDC are described below:

(1) Recognize that not all POI lessons require IAs. This is particularly true when conducting multiple lessons in the same location during the same day. In the example shown in figure 7-13, the instructor would likely perform classroom setup for all three lessons once at the beginning of the day and would likely perform classroom breakdown once at the end of the day. In most cases, no additional breakdown or setup IAs would be required between Lessons A and B and between Lessons B and C; therefore, no such IAs should be documented for Lesson B. Resist the urge to automatically assign IAs to every single lesson in the POI.

Day 1	Room	
0800-1100	221	Lesson A
1200-1400	221	Lesson B
1400-1600	221	Lesson C

The diagram shows a table with three rows representing lessons. To the right of the table, there are two grey boxes with arrows pointing left. The top box is labeled 'Classroom setup' and its arrow points to the first row (Lesson A). The bottom box is labeled 'Classroom breakdown' and its arrow points to the third row (Lesson C).

Figure 7-13. Instructor action example

(2) Avoid use of standardized IA times. Do not automatically assign the same IAs and times to every lesson. The point of IAs is to capture the actual and unique work requirements associated with specific lessons and POIs, not to attach a standardized time to every lesson. Example: Classroom setups for some lessons may take considerably longer than for other lessons. If Lesson A requires only 10 minutes of setup and Lesson B requires 90 minutes of setup, report the actual times for each. Use of standardized times would negate the intent of IAs.

(3) Make sure IAs do not duplicate tasks already captured in the POI as ICHs. Example: If an instructor spends time grading student tests or papers outside of the classroom, the TNGDEV may normally document that time as an IA. However, during hands-on testing, the instructor generally conducts the evaluation of the student on the spot during the time allotted for the lesson itself. In such instances, there should be no need for an IA to reflect the grading of the student; the grading occurred during the lesson, which already earns ICHs for the course.

(4) Keep IAs related to execution of the course. If instructors are required to participate in tasks such as in-processing of students, out-processing of students, or graduation-related events, the associated times may be documented as IAs. This is because these tasks are scheduled events conducted every time in direct support of the course. PRT/AFT time is provided as information and indicates the aggregate PRT/AFT conducted during the length of the course. PRT/AFT is not associated with course time, but should be included in the POI separately (not counted against academic or administrative time).

(5) Do not document IAs for tasks that Direct Support to the Training Event (DSTE) manpower should perform. Example: Instructors may perform IA tasks associated with training area prep/setup, but not all such tasks are instructor appropriate. DSTE personnel typically deliver supplies/water/ammunition. Do not document these as IAs, even if the instructors are performing the deliveries due to shortages of DSTE personnel.

(6) Do not establish targets for IA hours within a POI lesson. In other words, do not predetermine that IAs will be documented until they total to a certain number of hours, or until they equate to a predetermined percentage of course academic hours or ICHs. There is no target or ceiling for determining the number of IA hours to document in the lesson plan or POI. Document the legitimate number of IA hours associated with each applicable lesson plan. It is perfectly acceptable that some courses will have relatively few IA hours and others will have significantly greater hours. Expect this given the range of training strategies and conditions that apply to different TRADOC courses.

(7) Do not attempt to manipulate the number of IA hours so that the IRM will produce a predetermined number of instructors. Example: The old 1998 instructor model generated seven instructor requirements for a given course. Do not add IAs to the course POI lesson plans to force the IRM to produce more instructors. Document the number of IA hours that are legitimately required for each applicable lesson; no more, no less. The expectation is that some courses will earn more instructors when converting to the IRM and some will earn less. This is the natural effect of moving away from an instructor model that relied heavily on average allowances and moving to the IRM and its greater focus on what the lesson plan and/or POI actually document.

(8) Use the available fields in TDC to help explain/justify IAs that will not necessarily be obvious to outside personnel reviewing the lesson plan or POI. When documenting a classroom setup of 10 minutes, no further explanation is necessary. However, if classroom setup requires 60 minutes, use the available text field to explain what the instructor is doing and why it takes that long. Proactively explaining the IA may spare having the lesson plan or POI returned later for additional IA justification.

(9) Use the ISR field to indicate how many instructors are required for the IA. If necessary, explain the need for multiple instructors in the text field as well.

g. One recommended method for TNGDEVs to identify applicable IAs for the lesson plans in a POI is to conduct a detailed review of the course map/calendar with the course instructor(s) and/or course manager. The TNGDEV should ask the instructor to articulate the outside-the-classroom tasks that they perform as they progress through each lesson sequentially in the course schedule. Reviewing the lessons in a calendar mode is preferable to viewing them directly in the POI, which may not reflect an accurate lesson sequence. POIs also will not reflect the beginning and end of each training day, which has a direct influence on the timing and execution of many IAs.

h. All IAs are to be reviewed by both local QAOs and HQ TRADOC as part of the POI submission process. QAO will document concurrence and the number of IA hours (or non-concurrence) and enter the reason in the training development capability-course resource model change history section. The QAO review must document concurrence of IA hours prior to the POI going forward for commandant approval. Once the QAO and course manager accept the IAs, they or the training developer(s) will update the memorandum of transmittal to reflect the total IA time and identify the accepting QAO official. Once the QAO and course manager accept the IAs, they will update the memorandum of transmittal to reflect the total IA time and identify the accepting QAO official.

i. Currently, several categories of TRADOC courses are exempt from application of the IRM until they can be further evaluated. These exemptions are described below.

(1) Instructor requirements for consolidated ITRO courses are determined using a unique formula previously agreed upon by all services. Unless a change in ITRO policy occurs, the unique ITRO formula will be used. Therefore, the IRM cannot be applied to consolidated ITRO courses. At this time, there is no requirement to document IAs in the lesson plans for these courses.

(2) Historically, unique staffing criteria generated the instructor requirements for the basic combat training/one station unit training (OSUT) Phase I, and not the 1998 instructor model. HQ TRADOC G-8 and the Center for Initial Military Training are reviewing these unique criteria, and the applicability of the IRM for these programs will be evaluated. Proponents can use the IRM to determine instructor requirements for all OSUT Phase II programs and should document IAs for all Phase II POI lesson plans.

(3) Requirements for Instructor Pilots (IP) are currently determined by unique staffing criteria, and not by the 1998 instructor model. A review of IP staffing criteria is currently in the planning stages. Proponents can utilize the IRM to determine platform instructors for all aviation courses, including those that currently also require IPs; IAs should be documented for applicable platform instructor tasks in such lesson plans.

(4) Instructor requirements for most courses at the Mission Command Center of Excellence (MCCOE) and the Noncommissioned Officer Leadership COE are currently

determined by unique staffing criteria, and not by the 1998 instructor model. However, MCCOE and Noncommissioned Officer Leadership COE should document IAs in lesson plans for these courses, so there may be a proper evaluation of the applicability of the IRM to MCCOE and NCOL-COE courses. HQDA views MCCOE and Noncommissioned Officer Leadership COE's exemption from IRM application as temporary.

(5) The IRM is not well suited for application to RC courses. The IRM utilizes the Army Availability Factor (AAF) of 1740 hours per year. This assumes the instructors are "employed" full-time, so because RC instructors are often not Active Guard Reserve, the IRM cannot be used. It assumes flexibilities in student scheduling and cadre utilization that do not translate to RC training programs. Therefore, there is no requirement for RC activities to document IAs within their RC lesson plans.

j. At publication time, there was no HQDA mandate for use of the IRM by Army Commands other than TRADOC. Therefore, there is no need for other Commands to document IAs within their POI lessons unless they voluntarily choose to apply (or test) the IRM. TNGDEVs creating courses that are exempt from using the IRM will, when developing a lesson plan in TDC, turn off the CRM mode. Once the CRM mode is turned off, there will no longer be an option to select IAs.

7-18. Media

a. Media are any means or instrument of communication (auditory, visual, or written) that facilitate or enhance a lesson, or a part of a lesson, to demonstrate or clarify course content and to facilitate learning. Media are mechanisms to communicate learning content. Media can also serve as a means of storage for instructional material. Using a variety of media may respond to the needs of those who receive information in different ways. No single medium can support all instructional strategies. Therefore, the TNGDEV may choose a combination of media to meet the learning objectives and support the MOI. The TNGDEV should provide details of what the learner is to learn from any instructional media (for example, visual, audial) to be used during the lesson.

b. When selecting media, the following elements must be considered:

(1) Instructional effectiveness. The first media selection criterion must be its effectiveness in delivering required instruction to established performance standards. There may not be one best medium, but all media must pass through this effectiveness gateway to qualify for further consideration. If the course contains key technical information, processes, and procedures pertaining to the learner's functional area or develops a perishable skill, consider a medium that will be easily accessible from the field throughout the learner's career.

(2) Practicality. The intended media should be readily available, cost effective, time efficient, and understood by the instructor/facilitator. To achieve training and task performance proficiency, media selection should focus on learner interaction with an instructor/facilitator or a peer rather than on those media that require high fidelity.

(3) Affordability. TNGDEVs should consider costs related to procuring equipment, developing and implementing the lesson, and keeping the lesson up to date.

c. Table 7-8 provides general descriptions and other information regarding media. The media descriptions also incorporate various MOIs and instructional uses. It is acceptable to use media not listed in the table.

Table 7-8
Media descriptions and instructional uses

Media	Descriptions and uses
Video	<p>Description: Video uses moving images as a means to deliver the instruction. Video has the advantage of presenting abstract ideas in a realistic context, which helps learners grasp the abstract ideas more easily and helps them retain the material longer.</p> <p>Uses: Use video to demonstrate processes, procedures, and behaviors that can be difficult to describe. Use it to provide real world context, present information in a rich format, offer a sensory-rich experience, and appeal to visual learners. Introduce the video verbally or with text. Inform learners as to what they are to learn from the video.</p>
Printed material	<p>Description: Printed documents can be distributed to learners. These can include but are not limited to documentation, forms, manuals, student guides, JAs, and GTAs.</p> <p>Uses: Use printed materials in situations where learners require reference to documents for use in the course or subsequent job performance. They work well in asynchronous, self-paced learning environments.</p>
Graphics	<p>Description: The purpose of most instructional graphics is to help explain something to the viewer in a manner that increases retention of the subject matter. Graphics can include photographs, drawings/illustrations, charts/graphs, three-dimensional graphics, logos, icons, banners, and symbolic elements.</p> <p>Uses: Follow these guidelines for using graphics: use contrast to support visual cues, reinforce key concepts, display essential elements to maintain learner focus, and keep graphics in close proximity to related content.</p>

Table 7-8
Media descriptions and instructional uses, cont.

Media	Descriptions and uses
Programmed interactions	<p>Description: Programmed interactions include animations; interactive tutorials; tools such as drawings and displaying concepts and learner's aids; drag and drop media; calculators; scenarios; games and simulations; and self-checks and assessments.</p> <p>Uses: Follow these guidelines for using programmed interactions: keep focused on learning goals; facilitate clear learning paths; allow for learner pacing; eliminate irrelevant information and interactions; maintain a clean design for easy learner focus; and provide learner support tools, feedback, and visual and textual cues.</p>
Audio	<p>Description: Audio includes the recorded sound of a podcast, narrated lectures, presentations, interviews, guest speakers, synchronous audio conferencing, music, sound effects, or other primarily verbal communication.</p> <p>Uses: Use audio to appeal to aural learners, stimulate mental conceptualization and learner imagination, add credibility/authority to the presentation, and focus learner attention.</p>

7-19. Media delivery

a. Proponents may distribute instructional media to the intended audience in a variety of communication formats. Proponents base the media communication format on the needs and preferences of the target audience, costs of production, and the specific educational purpose. Table 7-9 lists the same media as table 7-8, but further identifies communication formats for these media.

Table 7-9
Media communication formats

Media format
<p>Video communication formats include web-based streaming; web-based download; optical media including but not limited to CD, DVD, and other video types; broadcast or network television; and video tele-training.</p>
<p>Printed communication formats include web-based download; hard copy in situations where learners will be effectively offline; and optical media to include CD, DVD, etc.</p>
<p>Graphics communications formats include live at instruction site, web-based streaming, and download of graphic files such as graphics interchange format or military standard, presentation, and hard copy.</p>
<p>Programmed interactions communication formats include live at instruction site, web-based conferencing tools, web-based streaming, instructional television, and computer-based instruction.</p>
<p>Audio communication formats include live at instruction site, web-based conferencing tools, web-based streaming or download of audio file, and telephone or conference call.</p>

b. TNGDEVs may adjust the media requirements during lesson development. The lesson outline includes the types of media that require development. However, it is common for TNGDEVs to adjust the media requirements. Any changes to media requirements are developed within available resources. If new media are developed, TNGDEVs execute the following steps:

(1) Assemble a team for media development that has the required skills and capabilities to plan, program, and budget resources for successful media development. This may require contractor support. (See TP 350-70-12 for IMI requirements for media development.)

(2) Ensure team members have a shared comprehension of how to use media to contribute to overall learning.

(3) Provide media development guidelines and standards to the development team. Ensure all team members have a copy of any templates, style guides, and file-naming conventions used for development.

(4) Review the following information with the team: copyright restrictions, procedures for obtaining copyright clearance, and sources of media that are not copyright restricted, such as .mil sites. Additional information on copyrighted materials appears in chapter 2.

c. Proponents should consider the specific steps for developing various forms of media, the tools used for media development and production, and the TNGDEV team's capabilities when selecting instructional media for delivery. Table 7-10 provides considerations and some basic steps for developing various forms of media. This list of media is not exhaustive.

d. TP 350-70-12 and the Army Distributed Learning Program website contain specific guidelines for particular forms of media, particularly interactive multimedia.

Table 7-10
Guidelines for developing new media

Media	Considerations	Basic steps
Text	<ul style="list-style-type: none"> • Use consistent terms and language that learners comprehend. • Use common, easily readable (san serif) fonts and ensure the font size is easily readable. • Use larger font sizes for titles. • Use bold text to draw attention to key terms or sections. • If text delivery will be on a computer, then refer to TRADOC graphical user interface specifications (http://www.atsc.army.mil). • Place text that describes a graphic within the graphic or as close to the graphic as possible. • Avoid showing screen text (other than titles) while a narrator is talking. • Close-caption may be necessary for some while the narrator is talking. 	<ul style="list-style-type: none"> • Draft/write material. • Edit material. • Publish material.
Sound	<ul style="list-style-type: none"> • Use consistent terms and language that learners comprehend. • Do not use a narrator with an accent that is not native to the language used. • Do not use music or other sound effects when the narrator is talking. • Avoid having text on the screen (other than titles) while the narrator is talking. • Avoid reading screen text. • Use the lowest sampling rate that produces the desired quality in order to keep file sizes small. • Use standard audio formats. 	<ul style="list-style-type: none"> • Storyboard or script narration and other sound requirements, such as sound effects or music. • Edit scripts. • Record sound. • Edit sound. • Publish sound.
Images	<ul style="list-style-type: none"> • Use a high resolution to improve print quality if using an image in a printed media. • Use the lowest resolution that provides the required image quality if using the image in electronic media. • Integrate titles and descriptive text with the image. • Use standard image formats. • Use standard colors and ensure there is sufficient contrast between background colors and the image. • Ensure the image directs the learners' attention to the key aspects. • Avoid using images that do not directly contribute to learning (for example, background images). 	<ul style="list-style-type: none"> • Storyboard or describe image. • Develop and edit image. • Publish image.

Table 7-10
Guidelines for developing new media, cont.

Media	Considerations	Basic steps
Video	<ul style="list-style-type: none"> • Use video to describe motion, show relationships, or increase immersion. • Keep video segments short. • Review storyboards and scripts carefully before recording. • Record scenes multiple times to ensure adequate footage for editing. • Use the lowest sampling rate and resolution that produces the required quality if using the video online. 	<ul style="list-style-type: none"> • Storyboard or script video. • Edit storyboards and scripts. • Plan video recording. • Develop required sound for the video. • Shoot and edit video. • Publish video.
Animation	<ul style="list-style-type: none"> • Use animation to describe motion, show relationships, or increase immersion. • Give learners control of the animation (for example, start, stop, and replay). • Use cues, such as arrows, to focus attention on the salient part of the animation. • Publish animations in standard formats. • If encoding animation as video, use the lowest sampling rate and resolution that produces the required quality if using the video online. 	<ul style="list-style-type: none"> • Storyboard or script animation. • Edit storyboards and scripts. • Develop and edit animation. • Publish animation.
<p><i>Note.</i> Proponents/organizations must ensure that the media type selected is viewed first from the end-users perspective to check for capabilities, soundness and effectiveness of the media before implementing.</p>		

7-20. Resources required

Required resource information includes but is not limited to equipment required to conduct the lesson, instructor materials (such as handouts), and ammunition types and quantities (if any). Table 7-11 provides guidance to determine the resources required to support a lesson in a resident and a nonresident/DL environment.

Table 7-11
Suggested resource questions

Resource	Questions
Equipment	<ul style="list-style-type: none"> • What specific equipment does the instructor and/or learners need (for example, laptop with secret capability or sand table)? • What equipment comes with the classroom type chosen (for example, Enterprise Classroom Program classroom comes with a projector, internet capability)? • How will the instructor and/or learners use the equipment in the course? • What are the required quantities of the equipment?
Facilities	<ul style="list-style-type: none"> • How much space does the instructor require? What type? • Are facilities available? • Are there special environmental requirements?
Funds	<ul style="list-style-type: none"> • What are the initial personnel, equipment, and facility costs? • What are the recurring costs associated with the course?
Personnel	<ul style="list-style-type: none"> • What categories of personnel are essential to develop the lesson (for example, computer operators)? • How many instructors are needed? What is the ISR? • What are the learner requirements? • What are the ICHs? • What are the IAs?
Time	<ul style="list-style-type: none"> • What are the milestones? • How much time is required to develop the instruction? • What is the estimated block or course length? • When must the COE/school order material to meet course milestones?

7-21. Measuring learner performance: assessment

a. Proponents should begin assessment design and development immediately after writing the learning objectives because they affect the lesson design and development. Assessments measure learner performance of the lesson ELOs and TLO.

b. TNGDEVs revisit the learner assessment plan, assessments, and assessment items. An appropriate time to perform this is upon completion of LSA development, to complete any further assessment or assessment item development needed. The methods of assessment must measure the learning objectives to the stated standards or level of attainment. Lesson design, development, or assessments should be verified, and adjusted as necessary, to ensure the standards are achievable based on the assessment(s).

7-22. Administrative data

a. The administrative data section in TDC includes required lesson identification information as well as an understandable title with only one objective. Other required information in this section includes identifying the modules, phases, and/or courses that link to the lesson plan, tasks taught or supported, reinforced tasks, required knowledge, and skills taught. Other mandatory

entries include the clearance access, FD statement, and current references. The instructor/facilitator requirements not only list the number of instructors/facilitators, assistant instructors, and demonstrators, but also the specific MOS, skills, certifications, and other qualifications required of instructors/facilitators to teach the respective lesson. The introduction includes identifying an appropriate MOI.

b. The list of references (to the paragraph level where practical) is used to develop the learning product. Civilian sources are listed by the type of source (book title, magazine, etc.), title of article (if appropriate), author, page numbers, and date of publication. TNGDEVs provide a source for any military references including reference number, title, and date. TNGDEVs follow all copyright guidance, as described in paragraph 2-6.

c. Other required information includes any additional support requirements and the name, grade, position, and approval date of the approving authority for the lesson.

d. The conclusion consists of a summary, re-motivation, and closing. Classified courses include a classification reminder in the conclusion.

e. TNGDEVs write details for any check on learning questions, as appropriate, and provide remedial training for incorrect responses to check on learning questions and answers. Check on learning questions are placed throughout the lesson plan to include the review/summary. TNGDEVs follow guidelines for the development of check on learning questions, as described in paragraph 11-13.

f. TNGDEVs develop an appropriate review/summary. This section should contain actual review/summary material, not just a directive for the instructor to conduct a review of the lesson. It must also include a check on learning for the TLO. TNGDEVs follow check on learning guidance, as described in paragraph 11-13.

g. TNGDEVs write a full description of the test, details on how the learner will perform the test, special requirements, and grading criteria. They also provide remedial training for incorrect responses to test questions/exercises.

h. A sample lesson plan is available on the TED-T website.

7-23. Quality control for lesson plans

For a quality lesson/lesson plan, development must be consistent with the analysis and design information, and the technical accuracy of the contents verified. The instruction must be feasible, cost effective, sequential, and progressive; the learning sequence must be effective; and the deficiencies must be identified and corrected. The Lesson Plan Administrative Requirements Checklist JA on the TED-T website provides a guide to ensure the lesson plan complies with administrative requirements.

a. ArmyU, Directorate for Learning Systems manages a Learning Enterprise QC process to review lesson plans for compliance with regulatory and proponency requirements, but not for specific learning content. The lesson plan checklists, Lesson Based upon a Task and Lesson

Based upon a knowledge or a skill, are available on the TED-T website. COEs/schools manage internal QC processes to review lesson plans for sound lesson design, regulatory requirements found in the TR 350-70 series documents, and specific learning content.

b. Each training proponent will establish QC review points in production processes. The goal of QC is to eliminate defects as early as possible in the process to minimize rework. Management will establish performance standards (efficiency/effectiveness) used to determine defects at QC review points. QC procedures are administered as part of the normal work process and are periodically subjected to review to ensure defect control processes are appropriate. QC data are used to determine process changes, staff training requirements, and initiate administrative procedure improvements as necessary.

Chapter 8

Job Aids, Graphic Training Aids, and Training Circulars

8-1. Job aids and graphic training aids

a. A JA is a tool to guide and assist performance on the job and minimize the need for recall or memorization in order to achieve a successful result. It can be a checklist, procedural guide, quick-setup guide, decision table, worksheet, technical manual, algorithm, or other device used as an aid in performing duty position tasks. A JA supports performance of either the total task or a portion of the task in the field as well as in the institution. JAs facilitate self-assessment and correction to improve performance when a user is engaged in detailed activities such as processing personnel actions.

b. A GTA is a product created to enable trainers to conduct and sustain training in lieu of using extensive printed material or expensive equipment. GTAs may also increase performance during on-the-job training. GTAs are in electronic format for Web distribution. When required, GTAs may be produced as charts, recognition cards, pamphlets, and booklets (pocket-sized), (See AR 350-38 for policies and responsibilities for Army-wide life cycle management for GTAs.)

c. JAs and GTAs should be developed and employed whenever possible to reduce or eliminate learning product requirements, instructional time, and cost. However, TNGDEVs must ensure the target audience has the skills and knowledge necessary to use the aid before making the recommendation to leadership to replace any portion of formal instruction with an aid. In some cases, limited formal instruction may be necessary to demonstrate how to use the aid. Only the proponent of a task has authority to develop GTAs for that task. The TED-T website provides several JA examples.

8-2. Job aid application

The procedure for applying existing JAs is described below.

a. Use the JA to determine the part of the task or job to perform. Use a JA when the following performance conditions exist:

(1) Speed or rate is not a critical factor in performing the task. If speed or rate is critical, a JA is not an effective tool because there is not enough time to consult the JA.

(2) Performance is infrequent, and it is unlikely someone will remember how to perform a specific task or set of steps. For example, instructions located on a fire extinguisher.

(3) Performance is lengthy or complex and requires numerous steps, decisions, or consideration of many factors, such as a flowchart for troubleshooting engine problems. The more steps involved in the task, the more challenging it will be for someone to recall all those steps correctly and apply them at the right time and place.

(4) Performance of the steps is difficult. The more difficult the steps are to perform, the harder the performer will find it to complete each step correctly. A JA can remind the performer of criteria, sequence, and considerations, and offer examples as well.

(5) Poor performance has negative consequences, such as increased risk of personnel or equipment losses. The greater the impact of error, the more important it is for the performer to do the task correctly. A well-designed JA is a good way to help the performer avoid high-cost errors.

(6) Performance of the task has a high likelihood of changing. Change could include new sequence/steps, new standards, new or additional equipment, or a new product. The more changeable the task, the less sensible it is to train to memory.

(7) There are no physical limitations to using a JA. Often people must work in settings where a JA might be a hindrance or even a danger, such as on or near machinery or uneven surfaces. There are numerous options to overcome difficult settings. For example, change the form/shape of the JA to fit the area where the JA is effectively used, or embed a JA into the device or system that the performer uses.

(8) There are no professional or social barriers to using a JA. Popular culture places a great value on appearing to know things. Using a JA as an external reference does not imply the user is not competent at completing the task. Instead, the use of a JA demonstrates the user employs tools available to ensure the successful completion of a complex task.

b. Use JAs whenever possible to reduce or eliminate learning product requirements, instructional time, and cost. Define the target audience and align the JA with the target audience's required skills and knowledge to use the JA effectively.

8-3. Job aid creation

a. Determine the part of the job or task to be performed using the JA.

b. Review data that affect a JA's design. Prior to creating a JA, review the target audience description and analysis data containing the content that will go in the JA.

c. Determine the purpose for the JA. Determine if the JA is informational, procedural, for decision support, or a coaching aid. Organize JAs by reference, function, sequential order, or subject matter structure to emphasize relationships and connections.

(1) Informational JAs form a ready reference for facts and concepts. They answer the questions Who, What, When, Where, and How? Informal JAs provide information for use during performance, such as an organizational chart or phone roster.

(2) Procedural JAs contain the actions and decisions required to complete the procedure, such as a list of steps for inspecting a piece of equipment. Worksheets and flowcharts are other examples. Procedural JAs explain how to execute a task and when to execute a task and use verbs to emphasize actions. Procedural JAs present actions as steps in a sequence. They may also provide feedback by showing action paired with results (so users can judge their interim and final performance).

(3) Decision support and coaching JAs support some complex job problems that require unique considerations to make decisions by providing ways to consider solving the problem when there is not a specific order or sequence of steps to solve the problem. For example, a JA may provide guidelines for preparing for an operation. These JAs coach the user to answer “Why?” and “How should I approach this?” These JAs make suggestions rather than provide directions, emphasize thinking and term definitions, model organizational perspectives on work and people, and articulate quality standards.

d. Determine if an existing JA can meet the intended purpose using the following guidance.

(1) Review existing JAs and materials from other sources (for example, other services) that may fulfill the JA requirement.

(2) If another JA meets the users’ need, then use it.

(3) If a JA requires revision for accuracy or utility, then use it.

(4) Use or revise an existing JA when possible to reduce cost.

e. Determine the JA format. The following seven formats are common but are not all-inclusive. Use any format that proves effective. TNGDEVs may use multiple formats within a JA.

(1) Decision steps. If-then statements direct the performer to the next action based on the decision. Use this format when the user must follow the sequential steps.

(2) Worksheet. The worksheet format lays out the steps and requires the performer to complete parts of the worksheet. Use this format when the user must perform calculations or document information as part of the performance and must perform the steps in sequence.

(3) Arrays. The array format allows the user to quickly view large bodies of information regarding who, what, or where in relation to the performance. An organization chart and a list of computer codes are examples of arrays. Use this format when the performance requires referencing data for easy access.

(4) Flowchart/algorithms. Flowcharts (also called algorithms) can depict action and decision steps or a series of decision steps. Use this format to guide the performer through a complex decision-making process that can be depicted with a series of Yes or No questions.

(5) Checklist. Checklists help performers think about general guidelines and strategies without having to recall them from memory. Use this format if there are critical attributes about the performance, if performers are familiar with the content, or if order of performance is not critical. Checklists are also useful for evaluating performance or products against criteria.

(6) Decision table. Decision tables allow performers to enter at any point and help performers consider several associated conditions or variables. Limit the number of choices or options. Decision tables present if-then situations requiring performers to identify solutions.

(7) Electronic performance support system. An EPSS is a computer software package that supplies immediate access to a database of integrated information, learning opportunities, and expert consultation. Performers control the scope and sequence. A wizard providing immediate and just-in-time instruction in a software program is one example.

f. Determine the JA media. The following JA media factors support selection of a medium to support a specific JA.

(1) Restrictions. Determine what JA media minimizes potential regulatory restrictions in the workplace.

(2) Effectiveness. Determine the media that provides the most effective JA support for the required performance. Is hard (surface) copy, a digital algorithm, or electronic or digital media best?

(3) Cost. Determine what media supports the required performance at the least cost.

(4) Maintenance. Determine what media material option is the easiest to maintain over the projected life of the JA.

g. Design the JA. Document the selected purpose(s), type(s), media, and content. Describe or include graphics and media required for development. Keep JAs as simple and short/brief as possible. Discuss the JA format and media with performers before making a final decision is beneficial. Keep the target audience in mind during JA design to sustain focus on the user.

h. Develop the JA. Follow these guidelines during development:

(1) Write a simple title that communicates the JA's purpose or facilitates easy recognition.

- (2) Provide instructions for when and how to use the JA.
- (3) Minimize text and use language the target audience comprehends.
- (4) Use action verbs for steps and if-then statements for decisions.
- (5) Segment information into small, easy-to-use blocks.
- (6) Use clear, easy-to-comprehend graphics.
- (7) Provide examples when appropriate.
- (8) Include appropriate FD and classification restriction statements.

8-4. Job aid validation

The validation of JAs requires the following steps:

- a. Identify target audience members that are available for validation.
- b. Schedule the time, facilities, performers, materials, observers, and other resources necessary to conduct the validation.
- c. Request performers use the JA to complete the work. Gather feedback from the performers regarding the JA using the JA Checklist located on the TED-T website.
- d. Revise the JA based on feedback from the validation. If major revisions are necessary, then repeat the validation to assess the revised JA.
- e. Complete local staffing procedures to obtain approval of the JA.
- f. Reproduce and distribute the JA. Submit for reproduction through local production channels.
- g. Maintain the JA. Review the JA periodically with SMEs to determine if information is accurate or must be updated. If the JA needs revision, collect data from SMEs regarding changes and repeat the applicable steps of the ADDIE process.

8-5. Graphic training aid design and development

The primary objective of a GTA is to enable trainers to conduct and sustain training in lieu of using extensive printed material or an expensive piece of equipment. Development and sharing of GTAs provides a means for reducing training development/training costs. GTAs may improve performance during on-the-job training. GTA use ranges from quick-reference memory aids to battalion simulation games. GTA developers are not restricted to a standardized format. The program encourages developers to use any degree of flexibility required to meet training requirements. GTAs incorporate a variety of instructional formats. GTAs are in electronic format for web distribution. When required, GTAs may also be produced as charts, recognition cards,

pamphlets, and booklets (pocket-sized). GTA production uses the same procedure as JAs with additional requirements as listed in table 8-1.

Table 8-1
GTA design and development requirements

Actions	Requirements
Design GTA	Design the GTA using the JA design guidelines. See the Army Distributed Learning Program website at https://tadlp.tradoc.army.mil/
Validate GTA	<ul style="list-style-type: none"> • Select a sample group of three to five representative GTA users. • Direct the group to perform a task individually using a draft GTA. Teach the group how to use the GTA only when users will receive formal instruction on how to use GTAs. • Study each trial user performing the task. Address three points: was the furnished GTA used in task performance, how was the GTA used, and was there any confusion associated with GTA use. • Administer the associated questionnaire to users.
Prepare and submit GTA request to Army Training Support Center (ATSC)/U.S. Army Combined Arms Center-Training (CAC-T)	<ul style="list-style-type: none"> • Prepare the requirements data sheet. • Submit developmental GTAs and print specifications to Commander, ATSC/CAC-T at usarmy.jble.tradoc.mbx.atssc-team-gta@mail.mil on DA Form 260-1 (Request for Publishing – DA Training, Doctrinal, Technical and Equipment Publications).
Gain ATSC/CAC-T decision	Gain and review ATSC/CAC-T decision on GTA. ATSC/CAC-T approves or disapproves developmental GTAs (new and revised). Upon approval, ATSC/CAC-T provides a GTA number on final text/artwork in accordance with DA Pam 25-40.
Develop GTA	<ul style="list-style-type: none"> • Develop GTA text/artwork. • Submit GTA text/artwork to Commander, ATSC/CAC-T. • Obtain approval for required revisions of artwork from ATSC/CAC-T. • Correct GTA as ATSC/CAC-T requires. • Complete GTA development.

Table 8-1
GTA design and development requirements, cont.

Actions	Requirements
Submit completed GTA to ATSC/CAC-T	<ul style="list-style-type: none"> • Submit the completed GTA to ATSC/CAC-T for reproduction and distribution with the following products and forms: <ul style="list-style-type: none"> ○ Convert CD with GTA to Adobe Acrobat press quality portable document format (.pdf) and embed all fonts. ○ Provide desktop publishing files in the native format. Include graphics and fonts. ○ Provide a completed DA Form 260 (Request for Publishing – DA Administrative Publications) that includes the following information: <ul style="list-style-type: none"> • Product specifications: paper type, size, how to fold the GTA, and the color. • Print quantity. • Provide POC phone number and e-mail address for coordination. <p><i>Note.</i> See fielding of GTAs for further explanation.</p>
Maintain GTA	<ul style="list-style-type: none"> • Review the GTA with SMEs to determine if it is current. • Collect data from SMEs if the GTA needs revision. Notify Commander, ATSC/CAC-T of GTAs requiring revision with anticipated completion date. • Revise the GTA and submit completed GTA to ATSC/CAC-T for reproduction and distribution. • Notify Commander, ATSC/CAC-T regarding obsolete GTAs.

8-6. Graphic training aid quality control

In effective GTA design and development, TNGDEVs ensure the GTA will carry out its design to accomplish, reduce, or eliminate formal instruction, provide safe operations, be immediately accessible to performers, and be usable and understandable.

8-7. Training circulars

A TC is a publication (paper or computer-based) that provides a means to distribute unit or individual Soldier training information that does not fit standard requirements for other established types of training publications. TCs are official departmental publications that are not doctrine, but doctrine based. TCs can contain information such as how to train for specific events or on pieces of equipment or weapons. TCs, which usually contain material based on doctrine, must use approved doctrinal terms and symbols, where applicable. It should be noted that only the proponent of a task has authority to produce TCs for that task.

8-8. Training circular analysis and design

TCs are a minimum essential requirement if a needs analysis identifies them as a training requirement. Use the chart in figure 8-1 to determine if a TC is the appropriate type of publication for training material.

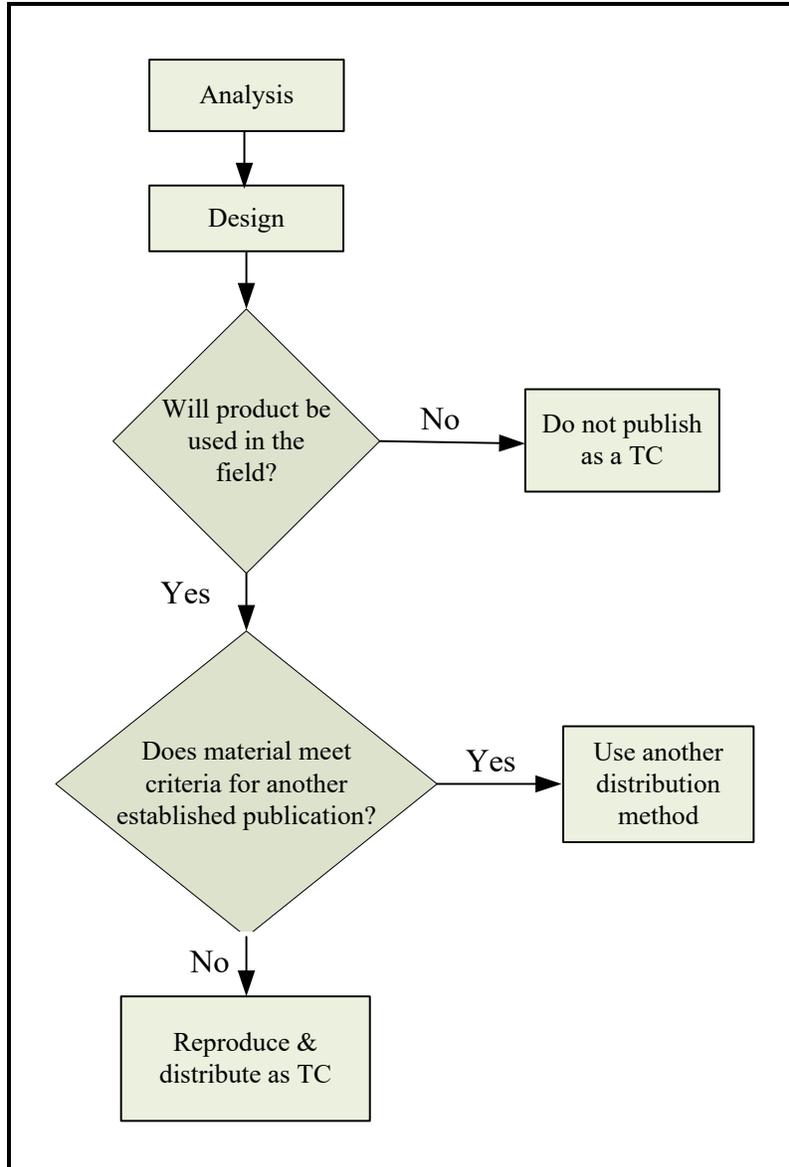


Figure 8-1. Training circular flowchart

8-9. Training circular development

Use format requirements based on the training need. TCs have no set format or development process according to AR 25-30 and DA Pam 25-40. Therefore, doctrine proponents may use the doctrine process and field manual (FM) template to develop them. TCs expire two years from the publication date.

8-10. Training circular quality control

To ensure QC, personnel involved in TC development must verify product usefulness, TC support of relevant analysis data, format, style, graphics effectiveness, technical content accuracy, and proper language and punctuation.

Chapter 9

Individual Training Support Packages

9-1. Individual training support packages introduction

A TSP is a complete, exportable package integrating training and education products and materials necessary to train/teach one or more lesson plans. The contents of the TSP will vary depending on the number of lesson plans included. A TSP normally consists of a cover sheet, administrative instructions, supporting products, and complete lesson plans. A TSP may be developed for an entire course or for a group of related lesson plans. It is possible to use the TSP at sites other than the development location. Alternate sites could be an RA school, a TASS training battalion, a unit, or via DL. Additionally, a TSP may be developed for new equipment training.

9-2. Training Support Package analysis and numbering

Analysis during lesson development determines the necessity to produce a TSP. The TSP is identified by the supported course number.

9-3. Training Support Package design

TSP design and development functions are performed simultaneously in essentially the same way as designing and developing courses and lessons to ensure training is sequential and progressive. TSPs can pull together the details of multiple lessons.

9-4. Training Support Package development

a. TSP development starts with the receipt of the TSP design. TSP development consists primarily of packaging the required material as a complete, comprehensive training package in TDC. The EPSS for TDC has the current procedures for creating an individual TSP in TDC. The following are steps in TSP development:

(1) Acquire the task performance specifications for the trained tasks.

(2) Develop and acquire the included training product(s) in TDC.

(3) Add administrative details.

(4) Staff the TSP with the personnel and activities as appropriate for the individual and/or DL content. Lessons can be associated with a TSP in an analysis state however, the lessons must be approved before the TSP is submitted in TDC. Only approved lessons are included in the TSP for approval.

(5) Obtain approval from the appropriate proponent command authority.

(6) Arrange for the distribution and reproduction of the TSP. Approved TSPs can be posted to the CAR.

b. TSP supporting products are the instructor/facilitator and student guides.

(1) The instructor/facilitator guide provides additional information needed to conduct the instruction. Both resident and nonresident/DL instruction guides are created, as required. Instructor/facilitator guides include but are not limited to the following content:

- (a) Course schedule.
- (b) Practical exercise sheets with learner instructions and answer keys (as necessary).
- (c) Slide presentations (as appropriate).
- (d) Tests and test solutions.
- (e) Instructor/facilitator notes necessary for execution.
- (f) Copies of student guides or handouts.

(g) Instructor/facilitator tips for online courses as necessary (for example, announcement templates or discussion board subjects).

(2) The student guide provides additional information to the learner necessary to achieve the objectives. Student guides include but are not limited to the following content:

- (a) Course schedule.
- (b) Instructor/facilitator contact information.
- (c) ISAP and assessments.
- (d) Student code of conduct.
- (e) Slide presentations (as appropriate).
- (f) Practical exercise sheets and instructions (as necessary).
- (g) Student handouts, including copies of articles and supplemental reading materials.
- (h) Special instructions (for example, discussion board assignments for DL courses).
- (i) References list.
- (j) Training aids.
- (k) Simulation and gaming references and information.

c. When generating a TSP, TDC automatically consolidates lesson plan information into four main supporting material portions: viewgraph master, tests and test solutions, practical exercises

and solutions, and student handouts. TDC pulls this information from the linked lesson plan(s). To create a TSP for a complete module, all lesson plans for that module must be linked to the TSP.

9-5. Training Support Package quality control

For a high quality and effective TSP, each involved leader and Soldier must ensure the TSP meets format and component requirements; the training provided by the TSP is feasible, cost effective, valid, sequential, and progressive; and all TSP components meet requirements identified in the respective chapters of this Pam. The TSP must be validated and approved prior to reproduction and distribution. The Individual Training Support Package Checklist JA on the TED-T website serves as a TSP QC checklist.

Chapter 10 Implementation

10-1. Implementation introduction

a. Implementation is the fourth phase of the ADDIE process. Within the institutional training domain, implementation consists of conducting training and education; delivering the learning content; achieving lesson and course learning objectives; and producing the learning outcomes within each individual graduate that will meet the performance needs targeted by the training or education.

b. Implementation actions required for individual learning products are as follows:

- (1) Prepare instructor/facilitator material.
- (2) Rehearse instructor/facilitator.
- (3) Conduct final coordination checks.
- (4) Prepare a formative evaluation report.
- (5) Provide instructor/facilitator feedback.
- (6) Complete learner assessments.

c. Core requirements for centers, schools, and other entities implementing training and/or education are as follows:

- (1) Comply with applicable laws and regulations.
- (2) Comply with safety and environmental protection rules, regulations, laws, and course requirements.

- (3) Ensure proper maintenance of required facilities, material, equipment, and systems.
 - (4) Obtain required reference materials and ensure instruction includes current and unpublished, approved doctrine.
 - (5) Implement based on approved analysis, design, and development outputs.
 - (6) Collect evaluation data per the evaluation plan developed in previous phases and provide appropriate feedback to the proponent.
 - (7) Maintain training and education records.
- d. Instruction may be face-to-face, DL, instructor-led, self-paced, or any combination of these. The exact resource requirements and level of effort needed to prepare the learning environment for implementation will vary. (See figure 10-1 which depicts general implementation planning and preparation activities.)

Figure 10-1. Implementation planning and preparation activities

- e. Support personnel requirements for implementation vary depending on the nature of the instruction. Course documents specify personnel requirements. Table 10-1 lists the personnel requirements that commonly support implementation. The table also provides associated actions and considerations for each requirement.

Table 10-1
Implementation personnel requirements

Personnel requirements	Instructor/facilitator actions and considerations
Support personnel may include the following individuals: <ul style="list-style-type: none"> • Assistant instructors/facilitators • Guest instructors/facilitators • Facility managers • Technology or technical support specialists • Administrative support staff • Range and safety officers • Transportation providers 	<ul style="list-style-type: none"> • Identify personnel requirements listed or implied in the course materials, learning products, and documents. • Confirm assignment and scheduling of individuals to participate in accordance with requirements in the course materials and learning products. • Verify that all assigned support personnel have met any training, qualification, and certification requirements listed in the course materials and learning products. • Contact each individual to ensure roles and responsibilities are clear in terms of course implementation requirements.

f. DL content delivery platforms are part of the Army Learning Content and Management Capability (ALCMC). The ALCMC provides a suite of integrating capabilities to enhance training and education. The Directorate of Distributed Learning provides required DL learning management system (LMS) requirements. An LMS provides a central location for the following processes:

- (1) Registering and enrolling learners.
- (2) Monitoring assessments and learner progress.
- (3) Distributing, delivering, storing, and presenting learning products.
- (4) Maintaining training and education records.
- (5) Collecting and storing feedback and evaluations.
- (6) Maintaining a database of learning products and resources.

10-2. Proponent preparation

The proponent ensures the course is on the calendar with enough faculty available to facilitate the course. The proponent verifies there are adequate times scheduled for faculty content workshops.

10-3. Training and education developer preparation

In support of implementation, the TNGDEV (or course manager) conducts a faculty content workshop. The sessions should replicate the actual instruction as much as possible. At a minimum, the course manager and/or TNGDEV should review each lesson with the faculty by covering the critical points of the course, conduct of the course, and assessment of learners. If

possible, the course manager and/or TNGDEV should use new faculty to act as learners and complete all learner requirements.

10-4. Instructor/facilitator and material preparation

a. Instructors/facilitators perform the following actions to prepare for implementation:

(1) Operate equipment, instructional media equipment, and automated training support systems. To ensure technical proficiency/preparedness, instructors/facilitators perform the following actions:

(a) Review all course materials and learning products (for example, lesson plans, student handouts, and references).

(b) Practice performing the actions/objectives or outcomes to standard as necessary.

(c) Rehearse and practice teaching with the various media, training aids, and JAs selected for each learning step activity.

(d) Practice using any operational equipment, test equipment, and tools.

(e) Practice inserting any problems or faults required by learning step activities to verify possible solution sets.

(f) Rehearse OPFOR tasks and role player requirements (when used) to ensure operational environment conditions promote the accomplishment of each learning step and activity. The threat manager can assist in these preparations.

(2) Respond to unique learner needs.

(3) Perform the instructional activities and learner performance assessments described in the TSP or lesson plan.

(4) Deliver the instruction to develop agile, adaptive, thinking Soldiers and DA Civilians who can perform and solve problems in various and constantly changing OEs.

(5) Conduct and participate in internal evaluation of the implementation process.

b. Instructors/facilitators use the information presented in the CMP and TSPs to perform the following actions:

(1) Reproduce and prepare handouts, JAs, training aids, and printed exercises.

(2) Reproduce the ISAP for distribution to learners or post the ISAP in the classroom. Present the ISAP to Soldiers and/or DA Civilians at the start of the course. For DL courses,

provide a copy to each learner as part of the course and/or phase introduction. For IMT, the ISAP requirements are different.

(3) Reproduce or make available all supporting media products for distribution to learners. Package and label the media products as applicable.

(4) Ensure availability of resources such as classroom, computers, projection equipment, screens, audio equipment, and possibly web-based software such as Blackboard.

(5) Inventory required classroom supplies such as paper, pencils, flip charts, and markers.

c. Instructors/facilitators conduct final coordination checks to prepare for course implementation. The Course Preparation and Coordination Checklist JA, available on the TED-T website, lists the resource requirements that commonly support implementation. The JA also provides actions and considerations for each requirement. Instructors/facilitators conduct final coordination checks by performing the following actions:

(1) Coordinate timing of checks with RA and RC. For RA one week prior is generally sufficient. For the RC however, check to ensure timeframe meets their standard for coordination checks.

(2) Teach RA and RC Soldiers to the same standard using the same or equivalent equipment, facilities, and TADSS.

(3) Involve the RC throughout the implementation process to ensure course requirements meet the needs of all Soldiers.

(4) Consult course documents for any unique resource requirements and add them to the final coordination checklist.

10-5. Evaluation

a. Evaluation is a systematic and continuous method to appraise the quality, effectiveness, and efficiency of a program, process, product, or procedure (TR 350-70). It provides the mechanism for decision-makers to ensure the application of consistent standards of quality. All centers and schools conduct evaluations on a continual basis pursuant to DA and TRADOC policy and guidance. Evaluation during the implementation phase of ADDIE includes learner assessment to measure achievement of Army learning standards and outcomes, as well as formative evaluations to ensure continuous improvement. Managers must ensure formative evaluation occurs during the implementation phase as specified in the program evaluation plan and maintain a formative evaluation report (audit trail) during implementation. The report includes a formative evaluation of each instance of learning product implementation, and the collection of critiques, feedback, and AARs for each instance. Critiques, feedback, and AARs collected after the completion of the implementation phase will contribute to data used for summative evaluation during the evaluation phase.

b. The formative evaluation report acts as an audit trail and includes the documentation to support the decisions made and the actions taken during the implementation process. The minimum essential requirements for the implementation formative evaluation reports are listed below.

- (1) Staff, faculty, and cadre training records.
- (2) Soldier and DA Civilian training records.
- (3) Periodic course reviews.
- (4) Documentation of instruction modifications and rationale.
- (5) Documentation of any discrepancies, defects, or omissions in implementation that require correction.
- (6) Documentation of environmental, security, and safety considerations.

c. AARs and reflective learning practices are structured activities in which instructors/facilitators and learners provide data on objectives, activities, and outcomes (see FM 7-0 for discussion of AARs in general). AARs and reflective learning practices capture learner perspectives. Instructors/facilitators may guide discussion to bring out important points. Conduct AARs immediately after completion of a learning event. Times that might be appropriate for an AAR include the end of each day of instruction, the end of a course, or any time learners appear confused or make frequent errors during performance; conducting too many AARs is better than conducting too few. Also, remember that any course changes, based upon AAR comments, should have supporting longitudinal data. Table 10-2 describes the elements of an AAR and the actions associated with each element.

Table 10-2
After-action review format

Element	Action
Introduction and rules	<ul style="list-style-type: none"> • Introduce the purpose of the AAR. • Outline the procedures for the conduct of the AAR. • Ensure participants comprehend the discussion is nonjudgmental.
Review of learning objective	<ul style="list-style-type: none"> • Clearly identify the TLO reviewed. • State the elements of the objective (action, conditions, and standard).
Review of what was supposed to happen	<ul style="list-style-type: none"> • Ensure all participants know exactly what the standard is, in order to measure success accurately. • Ask learners the expected way to get to the objective. • Focus learners on the question: “What was supposed to happen?” • Restate learning steps, if appropriate. • Refer to any evaluation checklists used.

Table 10-2
After-action review format, cont.

Element	Action
Summary of what actually happened	<ul style="list-style-type: none"> • Solicit comments from learners. • Focus learners on the question: “What actually happened?” • Capture strengths and weaknesses of the learning activity. • Ask participants to summarize points. • Reinforce what went well and fill in any gaps. • Solicit comments from OPFOR and role players (if used) as to their mission, observations on what they felt the learner(s) did well, and on what to improve.
Discussion of why the actual outcome happened and how to improve it	<ul style="list-style-type: none"> • Facilitate feedback from all participants. • Solicit suggestions on how to improve performance. • Guide discussion to keep it constructive and impersonal.
Summary	<ul style="list-style-type: none"> • Summarize the AAR discussion. • Make positive closing comments.

d. Pre-assessments, post-assessments, end-of-course critiques, and other feedback data primarily are collected through surveys and critiques to institute change to course implementation. End-of-course feedback seldom allows instructors/facilitators to obtain data in time to incorporate changes to actual needs, and so the instructor/facilitator should actively seek feedback throughout course delivery.

(1) Individual feedback from course participants is a valuable tool for identifying strengths and weaknesses in programs and courses. Most organizations have a standardized document for collecting this information from learners. Local policy and procedures must specify the data collection instruments.

(2) Throughout course delivery, instructors/facilitators collect feedback from learners on instruction, delivery, and instructor/facilitator performance. Methods to obtain feedback include but are not limited to the following actions:

(a) Listening to learners. Instructors/facilitators may gather information through many avenues such as informal conversations and group discussions.

(b) Analyzing learner surveys and critiques. This method is primarily an information collection tool.

(c) Observing learner performance and behaviors. This normally occurs as learners perform hands-on performance assessments.

(d) Reviewing learner-generated materials.

(e) Obtaining feedback from others, including peers.

(3) Responses to learner feedback include the following actions:

- (a) Summarizing what the learners liked about the instruction.
- (b) Listing the main suggestions made for improvement.
- (c) Outlining required changes (made or planned) for implementation.
- (d) Indicating what changes can and cannot be made and why.

10-6. Closeout management

a. Closeout management describes the activities instructors/facilitators perform to ensure successful implementation completion. The specifics of closeout activities may vary depending on the unique requirements of the program or course, but all must address internal course evaluation; administrative requirements; and personnel, facilities, and equipment management. The intended outcome of closeout activities is data collection about the implementation procedures associated with the course. It is important to report recommendations back to the proponent/component for corrections and updates to lesson materials. Closeout activities produce the following results:

(1) Completion of internal evaluations, including end-of-course critiques and end-of-course AARs, and documentation, per requirements. This includes submitting these reports to appropriate managers.

(2) Completion of all student record entries and data entry into the approved LMS in accordance with guidance. Student records are maintained in accordance with Army and TRADOC policy. TR 350-18 provides regulatory guidance on maintaining student academic records. These records include evaluations, counseling records, and assessment scores. Do not file copies of the assessment or exam answer sheets in student records.

(3) Completion of all facility and equipment activities. This includes the following activities:

(a) Return of facilities to their original state and release of the facilities back to the local organization.

(b) Return of equipment, training aids, and instructional equipment in a safe and serviceable condition.

(c) Performance of any required preventive maintenance checks and services (PMCS) on equipment or facilities, as appropriate.

(d) Reporting of identified safety issues and required maintenance or repairs to appropriate individuals.

(e) Maintenance of any hand receipt copies for equipment, training aids, and other items, as appropriate.

(4) Filing of all course materials and learning products as required by the local organization.

(5) Completion of all personnel management activities and release of support personnel to their parent organization or duty station.

(6) Completion, submission/transmission, and proper filing of all administrative documentation as required by the Army, TRADOC, and the local organization. Timely and accurate completion of Army learning documentation is a critical requirement of course closeout activity. Administrative documentation requirements include but are not limited to the following actions:

(a) Preparation of course completion documents, including any required by the local organization.

(b) Preparation of the course folder.

(c) Preparation of certificates of completion.

(d) Submission of entries into the LMS or other automated systems as required.

(e) Preparation of awards, certificates of appreciation, and similar documents for cadre, support personnel, and other organizations that support delivery of instruction.

(f) Preparation of AAR summary documentation.

(g) Preparation of instructor/facilitator feedback on course materials, learning products, and course implementation.

b. Closeout also includes the following QC procedures:

(1) Completion of the formative evaluation report.

(2) Review of and adjustments to any required resources.

(3) Conduct of lessons learned sessions with staff, faculty, and supporting staff.

(4) Documentation of lessons learned.

(5) Distribution of lessons learned to all key staff members.

(6) Review of the POI, including the CAD and ITP as necessary, and identification of any deficiencies.

(7) Development of contingency plans for overall operations as required.

(8) Update of milestone schedules as required.

(9) Writing of any required implementation reports to include successful risk assessment and mitigation techniques, techniques to improve learner performance, financial data, learner performance data, and instructor/facilitator performance data.

(10) Review of contracts supporting implementation, and adjustment of contracts if necessary and feasible.

Chapter 11

Assessment and Testing

11-1. Assessment and testing purpose

This chapter provides guidance for assessment of learner performance. Section I is an overview of an assessment, its purpose, types, and methods of assessment. It also provides guidance for assessment planning. Section II provides guidance for the development of performance- and knowledge-based assessments/tests and assessment instruments, managing and controlling assessments/tests, and analysis of assessment results.

Section I

Assessment Overview

11-2. Measuring learner performance: assessment

a. Assessment is the measurement of learning by an individual. Assessment of a learner is often accomplished through a test of whether or not skills, knowledge, and/or performance have been attained. Assessment is also used to determine the extent to which the learner achieves the expected outcome(s) of the lesson and/or course.

b. Learner assessment is different from evaluation. Results from learner assessments may be a valuable data source for evaluation of learning products and course or learning outcomes may indicate problems or weaknesses in the instruction or materials. Evaluation is a phase in the ADDIE process, which is used by instructional designers and training developers. However, the evaluation in the ADDIE process is different from program evaluation. It is a systematic and continuous method to appraise the quality, efficiency, and effectiveness of a program, process, procedure, or product. The two measures are related, such as in the formative evaluation of the design, development, and validation of the assessment methods and instruments. Assessment of learners supports the evaluation process and ensures an institution is conducting training and education adequately and to course standards.

c. Assessment is a broad term that encompasses all types of methods and activities that will effectively demonstrate a learner's mastery of new knowledge and skills. COEs/schools, institutions, and learning programs should use assessments throughout the learning process to

identify performers (those who can perform to standard) and non-performers (those who cannot perform to standard).

d. Learner assessments also identify problems or weaknesses in the instruction, indicate whether an individual or class is performing up to standards on specific objectives, and indicate the capability of the instructor, and the instructional medium, to facilitate learning.

11-3. Assessment types

The intended purpose, the way in which the TNGDEV selects content, and the scoring process that defines how to interpret the assessment results provide the basis for categorizing assessments. The two major types of assessments are criterion-referenced and norm-referenced. In accordance with AR 350-1 commandants, commanders and directors of Army schools will design, develop, and use criterion-referenced performance tests to measure student competency in accomplishing the objective of task-based training. See appendix B for additional information on the two major types of assessments.

11-4. Assessment methods

a. As the continuous adaptive learning model further expands learning opportunities beyond the traditional classroom, proponents should take considerable care to develop secure, technology-enabled, integrated assessments tailored to content and expected outcomes. Both the traditional classroom and DL locations should employ pre-assessment/test and post-assessment/test activities to measure learner knowledge, skills, and performance. Pre-assessments/tests allow developers to tailor instruction to the learners' needs and experience, and to create a method to allow Soldiers to test out of instruction when they demonstrate mastery. Post-learning assessments/tests provide the learner certainty that learning occurred to standard. Results can be input into automated tracking systems to provide near immediate feedback and record updates. Subjective assessments can add a valuable source of feedback on qualities and characteristics that objective assessments do not easily measure.

b. Both direct and indirect assessment methods provide the means to identify performance deficiencies and efficiencies of the learner. The best method of assessment is one that provides accurate information and evidence regarding the learner's mastery of the learning objective. Assessments/tests should be selected in terms of their ability to provide the most accurate information or evidence of learning. All Army assessment/testing must be performance-oriented (that is, either testing performance directly, or testing the knowledge necessary for performance, as determined from the task analysis). Section II of this chapter provides detailed guidance on development of performance-based and knowledge-based assessments/tests. Information on the use of rubrics to assess learner performance is also included in section II.

c. Formative and summative assessments may include direct or indirect methods of assessment. Direct methods require the learner to demonstrate the knowledge, skills and attitudes of the learning objective and provide observable evidence or data to directly measure achievement of the learning objective. Indirect assessment methods derive or infer learner attainment of the learning objective from information that is not directly observable or measurable. Although both methods are valid, direct methods of assessment are preferred.

Assessment involves the systematic collection, analysis, and application of feedback concerning the relevance and effectiveness of learning. Assessment of learners provides data to support the evaluation process and ensures a COE/school or institution is conducting training and education that meets course standards and Army needs.

11-5. Assessment/test development or revision decision-making

a. Proponents should create a new assessment/test or revise an existing one, when there is a new or revised TLO/ELO or poor measurement results. The TNGDEV bases this determination on the new or revised TLO/ELO and on an assessment/test which, when executed, received poor results. The Test Development or Test Revision Decision Making JA on the TED-T website provides a sequence of items to consider when deciding to create a new test or revise an existing test.

b. Proponents should document an audit trail of decisions made, via an assessment plan, to determine whether to create a new assessment/test or revise an existing one. Proponents may prepare an assessment plan consisting of the decisions made regarding what, how, and when to assess the learners in a course. An assessment plan would also include mastery/cutoff scores for each learning objective. An assessment plan also documents how and why the TNGDEV made critical decisions regarding learning measurement, and the source of the policies and procedures given to the learner. It is a plan documenting how to implement the assessment/tests and includes assessment/test policies and related SOPs. It may also include sensitive information that requires appropriate controls.

c. Writing the ISAP is a direct output of the decisions made and documented in the assessment design document or assessment plan. However, the ISAP makes the learner aware of only the course assessment and testing policy, procedural, and design decisions, not the entire content of the design document or assessment plan. In appropriate sections, the proponent writes the language and content toward the learners' responsibilities. All courses of instruction require an approved ISAP, regardless of course length.

11-6. Assessment design and development

a. Effective and efficient assessment design and development processes (and the associated QC of those processes) ensure that high quality, valid, and reliable measuring instruments are available to determine the knowledge, skills, attitudes, and performance abilities of Army personnel and to evaluate the effectiveness of military instruction. An assessment may be a stand-alone lesson or an integral part of a lesson or LSA. TNGDEVs place assessments in logical progression in accordance with the learning objective. The primary purpose of assessment is to measure learning by an individual. Assessment of a learner is often accomplished through a test of whether or not knowledge, skills, attitudes and/or performance have been attained.

b. Assessment design should begin immediately after writing the learning objectives during the design phase of ADDIE because of the potential impact on the lesson design and development. Proponents create the learner assessment after making the decisions pertaining to the number and type of assessments, learning outcome expected, level of learning expected,

placement in the course, number of items required, and level of optimum fidelity for the course and each assessment/test item. Proponents create an audit trail by documenting assessment design decisions in the ISAP and/or the assessment/test design documentation. The General Guidelines for Assessment Production JA and additional related JAs for development of assessments on the TED-T website provide additional guidance.

c. After completing the written assessment/test procedures, directions, equipment requirements, and scoring methods for a performance assessment/test, proponents prepare detailed instructions for the assessment/test participants. The primary requirement for assessment/test instructions is that they be complete, clear, and provided in writing or digitally (if using automated assessment/testing). When necessary, these instructions should also include diagrams and pictures to describe the assessment/test environment to the instructor/test administrator, the observer/evaluators, any actors, and the learner. The Writing Performance Assessment Instructions JA, on the TED-T website, provides more information.

11-7. Assessment/assessment item analysis

a. The proponent performs assessment/assessment item analysis to provide statistical data that can aid COE/school and institution leadership in making viable decisions concerning learner assessments. In addition, assessment/assessment item analysis data identify areas for lesson, test question, course, and instructor improvements. There are a variety of established procedures for analyzing criterion-referenced test (CRT) and assessment items. For example, the Assessment Item Analysis (Discrimination Analysis) JA discussed later in this chapter provides information on how to conduct one type of assessment/test item analysis and is primarily used to support the validation of assessment/test items. Because different types of analyses may be useful for different purposes, the proponent should identify and establish the specific procedures to use.

b. The proponent thoroughly documents the assessment/test instrument, the assessment/test items, item groupings, test groupings (coverage by learning objective), mastery scores, administrator test instructions, learner test instructions, and test proctor instructions in the assessment plan, and includes appropriate excerpts in the ISAP. Maintaining the rationale for decisions made and approvals acquired in the assessment development documentation provides an audit trail.

11-8. Managing and controlling assessments

a. Training and education managers should ensure that the conduct of all assessments is in accordance with an assessment administration guide or the ISAP. Managers perform the following actions:

(1) Confirm each course has an ISAP and ensure instructors/facilitators comply with its assessment administration guidance. (This supports the overall integrity, validity, and reliability of each assessment.)

(2) Ensure learner assessments are as objective as possible. Ensure instructors/facilitators use the same rubrics and/or score sheets to assess performance on the same assessment. Combine

and average multiple assessments to minimize subjectivity. Additionally, courses need to practice normalization so individual instructor scores are within an acceptable level of deviation.

(3) Ensure learners perform the learning objectives to prescribed standards, regardless of the method of assessment or learning domain of the learning objective.

b. Assessment/test managers should perform the following actions:

(1) Provide assessment materials directly to appropriate non-proponent learning institutions via hard copy or digital means.

(2) Establish procedures for analyzing assessment items.

(3) Identify and correct assessment problems.

(4) Ensure an invalid assessment does not cause learners to fail.

(5) Solicit feedback from non-proponent schools and institutions on assessments.

(6) Maintain a record of all assessment corrections until the next major course revision or complete revision and validation of the assessment.

(7) Develop policy for administration and control of assessments consistent with this Pam.

(8) Assessment test managers develop and implement appropriate assessment control measures, ensuring each learner has a fair and equal opportunity for completing the assessment. The Assessment/Test Control JA, on the TED-T website, provides guidelines for developing specific procedures consistent with the level of control required. AR 611-5 applies only for Army personnel tests listed in that regulation—it is not applicable to the majority of learning assessments used by COEs/schools and institutions.

d. COEs/schools and institutions should establish and maintain the following minimal requirements to manage and control assessments/tests:

(1) Establish written processes and procedures to control digital and hard copy testing and assessment materials.

(2) Identify and appoint test control officer(s) and alternate test control officer(s) on a duty appointment order memorandum.

(3) Document testing and assessment material reproduction, destruction, issue/return, and inventories.

(4) Implement security procedures for all testing and assessment materials to prevent compromise and potential cheating. Document security procedures in SOPs and ensure compliance.

Section II

Assessment/test development

11-9. Assessment/test development

This section relates critical foundational educational theories to developing performance-based and knowledge-based assessments. Army learning policy and procedures build upon several key educational foundations, including criterion-referenced and performance oriented testing. This section provides guidelines for design and development of CRTs, as well as guidance for development and use of rubrics to measure learner performance.

11-10. Performance-based assessment/testing

a. Performance-based assessments relate directly to the performance expected of a competent individual in the actual job situation through measurement of task/skill mastery. Performance-based assessment/testing includes assessments/tests of performance and assessments of the knowledge required to perform the tasks/skills in the actual job situation. Performance-based assessments/tests should ultimately determine what a person can do, and not only what they might know.

b. Determining the learner's readiness is necessary for effective, efficient, and safe instruction on the critical tasks and learning objectives. The design of Army learning is sequential and progressive; therefore, measuring learners' mastery of required prerequisite knowledge and skills which determines their readiness to undertake subsequent training. Task analysis makes the relationship obvious between some assessment/test items, measuring prerequisite or supporting knowledge and skills, and the actual task performances required on the job.

11-11. Performance and knowledge-based assessments/tests

a. There are two main groups of Army CRTs: performance-based and knowledge-based (sometimes called written). Written assessments/tests include all levels of the proponents' selected taxonomy, to foster critical thinking and problem-solving skills needed for operational adaptability. A performance-based assessment/test is one in which the learner actually performs a skill that is a TLO or ELO requirement. A knowledge-based assessment/test is an assessment based on job-related information that is analyzed to provide meaning, value, and understanding to perform skills, activities, or job functions.

b. In a performance-based assessment/test the learner must demonstrate that he or she mastered the required skills and knowledge by performing them in as realistic a setting as possible, or by using the skills and knowledge to produce something. What constitutes a performance-based assessment/test is not as clear as it may first appear. Performance-based assessments/tests may seek to determine mastery of mental (intellectual) skills through written means. This is in addition to assessment/test instruments that use or simulate actual equipment/situations to perform tasks or make decisions.

(1) If an assessment item (question, problem, or scenario) requires a learner to perform the same skill mentally as that required on the job, the mechanism of presentation and response is

not the important criterion. The question/item is a performance item. For example, if a land navigation problem, given in written format, requires the learner to work through a series of steps to determine the correct answer, it is a performance item (even if it captures the learner's answer through indicating the correct response in writing from a choice of four alternatives). In this case, the item is performance, and the multiple-choice response is a response format/method only, and not indicative that the item is a knowledge (predictive) test item.

(2) Knowledge based tests come in two styles: predictive and performance. In both cases, the student's knowledge (retain and recall) is being tested. However, in predictive, the knowledge recalled is not an absolute indicator of job performance. It is only predictive. Performance on the test only suggests how a student may perform on the job later. The knowledge tested, though important, may not require mastery in order to perform the job properly (for example, failure to recall the names of the parts of a rifle does not affect a Soldier's ability to disassemble and reassemble the rifle). Performance-based exams, on the other hand, are a direct indicator of how the student will perform the job. These types of written exams require mastery performance in order to accomplish a task. These exams are go/no-go criteria (with the exceptions as noted in appendix B). For example, failure to recognize which wire to cut to diffuse a bomb requires 100% accuracy and performance on the written exam is directly tied to the performance of a task.

(3) The response format for a performance assessment item is actual or simulated performance, short-answer, fill-in-the-blank, or multiple-choice. In contrast, knowledge-based (predictive) items only seek to measure knowledge. Appropriate response formats are short-answer, multiple-choice, or matching. A performance item assesses the learner's ability to perform cognitive or physical skills or tasks (or a combination of cognitive and physical skills, known as psychomotor).

c. A knowledge-based assessment/test, for TLO mastery purposes, is a test that consists of all assessment/test items used to measure mastery of a single objective. For differentiation purposes, an assessment/test instrument may have one or more knowledge-based TLO assessments/tests administered at the same time (that is, a single written assessment/test instrument may contain several assessments/tests, with each assessment/test measuring learner mastery on a different TLO).

(1) Proponents identify and evaluate the assessment/test items associated with each TLO independently of assessment/test items for any other TLO for purposes of administration and mastery determination. Many steps and procedures for the development of knowledge-based assessments/tests formats are similar, or identical, to those for performance-based assessments/tests.

(2) Performance-based assessments/tests use knowledge-based assessment/test formats to solicit the learners' response to a performance item. In almost every instance, the rules for developing and validating these formats are the same, whether they are used to measure knowledge or cognitive skills (performances).

d. The development of a knowledge/cognitive skills assessment/test items relies on multiple steps. These steps are not necessarily linear in their performance, nor are they all needed for corrections and improvements:

(1) Collect documentation.

(2) Select, review, and/or revise applicable learning objectives. Ensure that the objectives are sufficiently specific.

(3) Determine optimum formats.

(4) Determine scoring procedures.

(5) Design knowledge/cognitive skills assessment/test.

(6) Write the items and instructions.

(7) Validate the items and instructions.

(8) Revise as necessary.

(9) Obtain approval.

(10) Update the ISAP and assessment/documentation plan.

e. Also, knowledge/cognitive skills assessment/test items have the following characteristics and uses:

(1) Provide an assessment/test capability for knowledge/cognitive skills that enable performance of the desired task/action when direct assessment of the performance is not feasible. That information enables prediction as to whether the learner is able to perform the task.

(2) Assist in determining if the learner obtained certain prerequisite knowledge or skills necessary for learning the actual performance efficiently and effectively (and, sometimes, safely).

(3) Predict learner performance on actual performance assessments/tests measure knowledge/cognitive skills necessary for task performance.

(4) Employ multiple formats, including essay, short answer, fill-in-the-blank, labeling (or a computer-based version of labeling, called drag-and-drop), multiple-choice, or matching.

(5) Require learners to demonstrate mastery of supporting knowledge/cognitive skills by responding to various types of written, oral, or computer-generated questions.

(6) Emphasize knowledge related to a learning objective. An example is requiring learners to find, read, and use technical materials.

(7) Are usually independent questions, and the assessment/test item sequence usually will not affect the outcome of the assessment/test (with possible exception).

(8) Do not seek to, nor can they, directly measure non-cognitive skills or task proficiency.

f. A written or verbal performance-based assessment/test may consist of writing on a prepared piece of paper, entering digital responses into a computer, or stating the answer orally. Written or verbal assessment/test methods are suitable to test the following learning outcomes:

(1) Discrimination, concrete concept, and defined concept intellectual skills.

(2) Rule-learning and verbal information intellectual skills.

(3) Cognitive strategies and intellectual skills

g. Some tasks, especially equipment operation tasks, involve many different intellectual and motor skills performed in an integrated manner. Combined intellectual skills and motor skills, associated with performance of a hands-on task, are psychomotor skills. A psychomotor performance test measures combined intellectual and motor skills associated with a hands-on task. For example, the psychomotor task of bleeding a hydraulic brake system involves the following skills:

(1) Recall of a procedure (rule learning intellectual skills).

(2) Physical performance of the steps (motor skill).

(3) Recognition of the parts and tools (discrete concept intellectual skills).

(4) Observation of the brake fluid conditions in the system (discrimination intellectual skills).

(5) Cleanliness and safety (attitude skills).

h. Another name for psychomotor skill performance is hands-on test or hands-on performance assessment. A psychomotor skill performance assessment/test has the following attributes:

(1) The test requires a real or operational mock-up of equipment, or computer-generated simulations of equipment operation. If fine tactile manipulations are critical to performance, a computer-based simulation is not appropriate—actual equipment, operational mock-up (to scale), or a simulator that accepts and responds to the necessary tactile input is required.

(2) The test requires the learner to demonstrate mastery of an actual operational hands-on task.

(3) The content of the test is valid (in other words, the test has content validity). A hands-on performance assessment/test is the most content-valid assessment/test of any kind of learning.

(4) The assessment/test is time-consuming, in general, because it often requires one-on-one interaction with real equipment or simulators to conduct the test.

i. Knowledge-based assessments/tests predict performance in two situations:

(1) When it is not feasible to conduct a direct assessment of the performance, behaviors that enable performance of the desired skill are assessed instead. This information is used to predict whether the learner can perform the operational task. For example, if a learner writes the steps for bleeding a brake system, there is a better probability that the learner can actually perform the task, compared to someone who did not know the steps. Knowledge-based assessments/tests should not be used if performance assessment/testing is possible.

(2) Use a knowledge-based assessment/test to determine if the learner obtained certain prerequisite knowledge (defined during task analysis) necessary to progress to learning the actual performance in a safe, efficient, and effective manner. This is common in a well-designed sequential and progressive course. Knowledge-based assessment/testing affirms the learner's readiness to move forward to actual performance training and assessment/testing.

j. Knowledge-based assessments/tests are valid to the extent that they predict learner performance and measure knowledge proven necessary for task performance.

k. The most common types of knowledge-based (predictive) written assessment/test questions are essay, short answer, fill-in-the-blank, labeling, multiple-choice, matching, and true-false. Assessments/tests that require the learner to perform a skill/task, ascertain an answer, and select from a list of possible answers have slightly less validity, due to the guessing possibility. It is best that the learner actually write/state the answer in response, rather than just selecting it from a list of alternatives.

l. Computer-based knowledge-based assessments/tests use different types of input systems that have a high degree of fidelity with real-world tasks. A simple input device, such as a joystick or mouse, allows for identification by pointing with a cursor.

m. The best type of assessment/test is one that provides accurate information and evidence of the learner's mastery of the objective. Assessments/tests should be selected in terms of their ability to provide the most accurate information. Table 11-1 depicts the differences between knowledge-based and performance-based assessment/test items.

Table 11-1
Knowledge-based and performance-based assessment/test item comparison

Knowledge-based assessment/test item	Performance-based assessment/test item
Requires learners to demonstrate mastery of supporting knowledge by responding to various types of written, oral, or computer-generated questions.	Requires learners to demonstrate mastery of TLOs or ELOs by responding to various types of written, oral, or computer-generated questions or by performing a job task under controlled conditions.
Emphasizes intellectual knowledge related to a performance objective.	Emphasizes intellectual skills associated with the hands-on performance of a motor skill (psychomotor skills).
May require learners to find, read, and use technical materials.	May require learners to find, read, and use certain technical materials (JAs, for example).
Items are intellectual skills that require mastery to enable job performance.	Items are often sequential intellectual or motor skills.
Items are independent questions, and the test item sequence does not always affect the outcome of the test. Errors on one test item do not always affect performance on another item.	Errors early in the performance sequence often affect the outcome of the task.

11-12. Test placement in a course

Course tests are divided into the categories of pre-test, within-course, and post-test. The course design and learning objective(s) guide the incorporation of assessments throughout the course in logical progression.

11-13. Pretests

Pretests verify if the learner previously acquired the prerequisite (entry-level) skills, knowledge, and proficiency (if any) necessary for the learner to master the material in the subsequent unit of instruction. Pretests also test a learner’s prior mastery of the learning objectives (knowledge, skills, and proficiency) the subsequent phase/module/lesson teaches. TNGDEVs should specify the type of pretest using the terms in this Pam, rather than the generic term “diagnostic test.” The types of pretests and their applications are described below.

- a. Prerequisite pretests. Prerequisite pretests—also known as prerequisite verification pretests—given at the beginning of any type of instructional unit (that is, phase, module, or lesson) verify mastery of prerequisite objectives/tasks. If the results verify the learner obtained the required prerequisite skills, knowledge, and/or proficiency, the learner proceeds with the subsequent training. Pursuant to established COE/school policies and procedures, commandants/commanders take appropriate action if the learner does not possess necessary prerequisite skills and knowledge. It is crucial to execute the entry-level skills/knowledge pre-assessment before the first lesson of the course that requires the prerequisite or entry-level skills and knowledge. Additionally, when there is a substantial break in time between the courses, phases, or lessons, pre-tests are necessary.

b. Performance pretests. Performance pretests demonstrate a learner's capability to perform when there is no clear evidence of prerequisite attainment. Before proceeding with a pretest, instructors/facilitators conduct a risk assessment. Instructors/facilitators proceed with the performance pretest, if the risk assessment clearly indicates that conducting it is not harmful to personnel or equipment. In short, if harm could come to a learner or others (or equipment) when trying to perform tasks/skills in which the learner is clearly inept, do not ask the learner to perform. The pretest is stopped immediately if testing is underway.

c. Mastery pretests. Mastery pretests—also called objective mastery pretests, summative tests, or mastery tests—determine if the learner attained prior mastery of the tasks and/or supporting skills and knowledge taught within a subsequent instructional unit (course/phase, module, or lesson). Mastery pretests derive from the tests/post-test of the instructional unit and cover the same objectives(s). Proponents may use an objective mastery pretest before a course, phase, module, or lesson to test out of objectives taught during an instructional unit. This is another way of certifying the learner's mastery of specific tasks.

11-14. Check on learning

A check on learning is an informal, required check, to determine if the students are learning. At a minimum, a check on learning will be located in the review/summary/apply portion of the lesson plan in order to determine if the students achieved the TLO. A check-on-learning can also be located in the LSAs. Check on learning can also be used throughout the lesson plan to determine if the students are progressing appropriately towards achievement of the TLO. There are several types of checks on learning. Examples may be a short ungraded quiz, an ungraded practical exercise, and could be written, verbal, or performed in a small group. They also include check on learning questions. Instructors provide remedial training should students fail during check on learning sessions.

a. Checks on learning may also employ various techniques and methods, such as interactive technology, compare-and-contrast activities, concept mapping, etc. These varied methods and techniques foster critical thinking and problem-solving skills in support of GLOs. Well-written check on learning questions reflect the following characteristics:

(1) They assess the progression of learning, moving sequentially from the lower level of learning, then adding questions up to and including the same learning level as the learning objective.

(2) They require more than recall of a skill or knowledge.

(3) They benefit learners in terms of problem solving.

(4) They are open ended; more than one acceptable answer may exist.

b. Checks on learning should provide reference(s) for the answer or response(s). In addition to knowing the answer or response, the learner needs to know where to find the answer/response in the required reference. Additionally, check-on-learning questions for self-paced instruction

should include references in the course materials or media and provide remedial instruction for incorrect answers or guidance for good/better/best responses.

11-15. Within-course assessments/tests

a. The design of within-course assessments/tests supports sequential, progressive learning and measures performance since the previous assessment/test. The assessments/tests may include material from earlier in the course for reinforcement. They are a stand-alone lesson or an integral part of a lesson (a learning step/activity) and may cover part of a lesson (within-lesson assessments/tests), one lesson (most common), or multiple lessons. Within-course assessments/tests are administered end-of-course, end-of-phase, end-of-module (sub-course), end-of-lesson, or within-lesson.

(1) Proponents may use within-lesson assessments/tests to determine mastery of individual ELOs, or as a graded practical exercise. An ungraded practical exercise would not meet requirements given it is ungraded by definition. While proponents may use a within-lesson assessment/test is not however a requirement.

(2) End-of-lesson assessments/tests are the most common type. They measure TLO/ELOs taught within the lesson. The grouping of assessments/tests measuring several TLOs is for convenience in administration only; TLO mastery should be determined independently for each TLO. This group of assessments/tests may cover several lessons and does not have to be an end-of-phase/module assessment/test. End-of-lesson assessments/tests are a requirement for each lesson, unless the assessments/tests for the learning objectives of several lessons are grouped during one test administration.

(3) End-of-module (sub-course) assessments/tests ensure learners can competently perform the learning objectives of a specific module (sub-course); however, they are not required.

(4) End-of-phase assessments/tests determine a learner's accomplishment of all learning objectives presented in the phase. A recommendation is to conduct an end-of-phase assessment for courses structured with a significant time gap between the phases, or a major change in training focus between phases. These assessments/tests are not required.

(5) End-of-course assessments/tests determine a learner's accomplishment of all learning objectives presented in the course. They are not required for any TRADOC-produced/managed course, and are not required unless there is a specific, educational requirement for that assessment/test.

b. End-of-phase assessments apply when a DL phase teaches prerequisite knowledge/skills that a following phase (usually resident) uses and builds upon, in the normal sequence and progression of the instruction. While the decision to use end-of-phase assessments/tests is a design issue specific to each DL course/module, the following guidance applies:

(1) An end-of-phase assessment should be used if there would not be conclusive evidence that the learner acquired the skills/knowledge taught during the DL phase until after entry into

the subsequent resident phase (where their acquisition is determined via assessment/testing). While skill/knowledge mastery is within the sequential and progressive design of the course, there is a potential risk to attainment of mastery when certification of proficiency does not take place after each phase/module/lesson incrementally throughout the DL training. Several potential situations and factors to consider are listed below.

(a) The resident phase quickly builds upon the expected mastery of the knowledge/performances taught in the DL phase. For example, the resident phase moves quickly into the hands-on practice of procedures taught within the nonresident/DL phase.

(b) There is a substantial break between the nonresident/DL phase and the resident phase.

(c) The nonresident/DL phase is of such length that there is suspicion or proof of decay over time in the knowledge/skills taught early in the phase, and the need exists for reinforcement/sustainment before the learner exits the phase. This may also apply to a course taught entirely by DL even though the assessment/test, by definition, is now an end-of-course assessment/test and not an end-of-phase assessment/test.

(d) There is no time within the resident phase for retesting or remediation.

(e) The end-of-phase assessment/test is really a capstone performance, or knowledge-based exercise, used to measure the mastery of the critical combination of knowledge and taught individually throughout the phase.

(f) There is other evidence to suggest that there is a high (rapid) decay rate for the skills/knowledge taught during the DL phase and a determination of skill/knowledge retention is necessary.

(2) The end-of-phase assessment/test is the last opportunity to determine skill/knowledge mastery and provide remediation to mastery, prior to the use of the knowledge within the subsequent phase. Some mitigation of risk is possible by the planned pre-testing of the resident phase prerequisites at the beginning of the resident phase (that is, pre-testing knowledge/skills acquired during the nonresident/DL phase). Nevertheless, it is more cost-effective to provide remediation and retesting during the nonresident/DL phase than to retrain/remove a worker from training after he/she reports to the resident phase.

11-16. Post-assessment/test

Learners take a post-assessment/test after completion of an instructional program or unit of instruction to measure their achievement and the effectiveness of the training/learning. Post-learning assessments/tests provide both the supervisor and the learner certainty that learning has occurred to the standard. In general, the assessment/testing of learner performance of a specific learning objective is completed when instruction for that learning objective is complete. There is no requirement for an end of course assessment/test, unless there is a course TLO established at course level, or if there is an external accreditation or certification requirement for a post-assessment/test.

11-17. Assessment/test design

Assessment/test design considers many factors such as what to measure, when to assess/test, how long the assessment/test should be, how to match desired learning levels to the level of assessment/testing, and if knowledge/skills need to be retained or transferred.

a. Determine what to measure.

(1) Perform an analysis of the TLO(s) and ELO(s) to identify the skills and knowledge components to measure.

(2) List the actions to perform and the TLO and ELO behaviors the assessment/test covers.

(3) Assess/test each TLO independently of other TLOs.

(4) Identify one or more assessment/test items to measure each TLO and ELO behavior.

(5) Design assessments/tests to measure all of the skills and knowledge required to master each TLO and ELO behavior. This process results in determining which assessment/test items are performance, and which assessment/test items are knowledge-based.

(6) Substitute a written assessment/test when it is not feasible to assess/test all the learners using actual equipment.

(7) Use table 11-2 when designing written CRTs. This form helps ensure that an adequate quantity of assessment/test items are developed and administered to determine the proficiency of the learner to perform the learning objective(s) being assessed/tested. For written assessments/tests, develop at least two versions of each assessment/test by determining the minimum number of items needed to assess/test each TLO/ELO and then constructing at least twice that many items.

Table 11-2
Assessment/test plan for a written assessment/test

Lesson/ TLO number	ELO number (optional)	Learnin g step activity	Quantity of questions needed for coverage of ELO per version	Total quantity of questions for step	Total quantity of items for two versions
0001	0001 A	A-1	2	4	
		A-2	1	2	
		A-4	1	2	
		A-5	3	6	
		A-7	3	6	20
	0001 B	B-1	5	10	
		B-3	3	6	16
0002	0001 A	A-2	3	6	
		A-4	2	4	
		A-5	2	4	
		A-6	2	4	18

(8) Set the passing score for written assessments/tests based on the performance standards and measures established for each task and/or higher-level thinking skill being assessed. The impact of incorrectly identifying a learner as a performer (a false positive error) far outweighs the impact (retraining/retesting and delay of human assets to units) of incorrectly identifying a learner as a non-performer (a false negative error). Do not use written assessments/tests as the sole criteria to determine class standing. Refer to appendix B of this Pam for a detailed discussion on setting test standards (passing scores) for performance based written assessments/tests.

b. Determine when to assess/test.

(1) In general, administer assessments within a lesson (to determine mastery of an ELO) or after a lesson. However, a logical grouping of TLOs/ELOs may be assessed/tested after a group of lessons or at the end of a module. The type of assessment/test (performance or knowledge-based) influences this grouping.

(2) Establish general rules for when to assess/test, such as the following:

(a) Give assessments/tests after training/teaching each TLO.

(b) Assess/test TLOs simultaneously with other TLOs; however, determine learner mastery on each independent TLO assessed/tested during this assessment/testing session.

(c) Assess/test TLOs sequentially if a TLO is a supporting skill/knowledge (prerequisite) for a later TLO. Assess/test the supporting TLO (skill/knowledge) first to ascertain the learner's readiness for training and assessment/testing on the supported TLO.

(3) Preferably, excluding retests for initial non-mastery, assess/test each TLO for mastery once as a pretest, and once as a within-course assessment/test (although multiple successful repetitions of the required action during that one assessment/testing session meet the definition of task mastery). If there is an accurately defined mastery standard, the learner met that standard, and the course is sequential and progressive, assume that retention occurred, and allow the use of the prior obtained knowledge or skills in later portions of the course. However, consider conducting another assessment/test of the same objectives to reinforce the previously taught TLO(s) and verify retention (of mastery) of the previously taught TLO.

c. Determine assessment/test length.

(1) An assessment/test is long enough if the assessment/test (items) matches the objective and provides sufficient information to make a master/non-master decision. Sometimes, one iteration of successful learning objective performance is sufficient to determine mastery. For other more critical TLOs, several successful iterations (or a percentage of successful versus failed attempts) are necessary to demonstrate true mastery. The number of TLOs assessed/tested determines knowledge-based assessment/test length. Although it is usually advisable if each TLO/lesson builds upon the previous TLO/lesson, each TLO does not require separate

assessment/testing. A single assessment/test administration may cover and provide mastery evidence of several TLOs/ELOs.

(2) Statistically, there are a number of arguments for between five and twenty assessment/test items per objective. Using this advice could easily create a situation in which the assessment/test lasts longer than the course. Proponents should compromise between this idea and more practical concerns. In general, there are four factors to help determine the number of items per objective:

(a) Consequences of misclassification. Weigh the costs (risks) of judging a master as a non-master, or a non-master as a master. With the greater costs of an error, there is greater need for multiple assessment/test items.

(b) Specificity of the objective requiring assessment/testing. Consider the objective—the more specific the objective, the smaller the number of assessment/test items needed to determine proficiency. This is especially true with performance assessments/tests. For example, an observer would not require a trainee to hammer a nail into a board 20 times to determine proficiency on this task; three or four times would suffice.

(c) Multiple TLO conditions. Consider accommodation of multiple testing conditions. If there is an expectation that a trainee is to perform the TLO under a number of different conditions where performance might vary, make decisions about which conditions to assess/test within the learning environment. If assessment under multiple conditions is not possible, bring more assurance of TLO mastery through multiple repetitions of performance, under the same set of conditions.

(d) Time available for assessment/testing. Weigh the time needed for an adequate assessment/test against the time available. While an ideal assessment/test might last one and a half days for a five-day workshop, it usually is not possible to allot such a large amount of time.

(3) The length of an assessment/test is a function of the number of objectives and at least the four factors listed above, which determine the number of questions needed per objective. The amount of weight given to each factor varies, based upon the objective, the course, and resources. For example, an assessment/test on a very specific skill, which learners usually perform under a single set of conditions, for which the consequences of misclassification are small, would use a single assessment for that skill. However, if assessing a very complex objective, for which the consequences of misclassification are great, and/or different conditions may affect performance, then development of multiple assessment/test items is required, based on the objective. In either situation, further decisions on assessment/test length, as a function of time and cost factors, are required. Advice from SMEs assists in weighting these factors.

(4) In general, unless the assessment/test covers many TLOs (end-of-course/phase/module), a knowledge-based assessment/test should not require more than four to five hours to complete (The goal is to assess knowledge/skills, not endurance.) For performance items, the assessment/test should last as long as is needed to certify mastery or determine non-mastery. If multiple iterations of performance are necessary to certify mastery/determine non-

mastery or if any iteration lasts longer than a few hours, the schedule should include planned breaks. In only specific instances is stamina an assessment/test condition, or the learner's stamina assessed/tested (for instance, the AFT).

d. Match desired learning levels to level of assessment/testing. In designing an assessment/test, correlate the level of assessment/testing with the level of learning found in each ELO and TLO behavior.

(1) The outcomes of planned instruction consist of learner performances that demonstrate acquired capabilities. The types of learning are intellectual skills, verbal information, cognitive strategies, motor skills, and attitudes.

(a) Assess learner performance to determine whether the newly designed instruction met its design objectives.

(b) Conduct assessment to learn whether each learner achieved the set of capabilities the instructional objectives defined.

(2) Table 11-3 depicts the best methods of assessment/testing, and examples of the appropriate activities, based upon the desired outcomes (intellectual skills, verbal information, cognitive strategies, motor skills, and attitudes of the instruction).

Table 11-3
Methods and activities for types of learning outcomes

Type of learning outcome	Best method of assessment/testing	Activities that indicate achievement of objectives
Intellectual Skills: Discrimination	<ul style="list-style-type: none"> • Knowledge-based tests. • Multiple-choice. • Short answer. 	Detect similarities or differences.
Intellectual Skills: Concrete/Defined Concept	Constructed response (labeling, sorting, matching).	Recognize examples or non-examples.
Intellectual Skills: Rule Learning	Performance of integrated tasks or constructed response (short answer).	<ul style="list-style-type: none"> • Apply rule, principle, or procedure. • Solve problems. • Produce a product.
Verbal Information	Constructed response (fill-in-the-blank, essay questions, oral testing).	State information verbally or in writing.
Cognitive Strategies	<ul style="list-style-type: none"> • Performance assessments/tests. • Oral testing: Learner explains process to assessment/test administrator. 	<ul style="list-style-type: none"> • Self-report or audit trail of work done. • State strategies, tactics, and expected results of actions.
Motor Skills	Performance assessments/tests.	Perform smooth, timely coordinated action.
Attitudes	<ul style="list-style-type: none"> • Performance assessments/tests. • Observation: Administrator observes learner in different situations. 	Display desired situated behavior.

e. Design for retention or transfer.

(1) It is possible for a learner to pass an assessment/test and still not accomplish the education or training requirement, if either the instructional program or the assessment/test, is inadequate. The assessment/test has reliability, in that it measures how well the learner retained the specific course content, but not how well the learner transfers his or her newly acquired knowledge and skills to the job performance. For example, a learner that remembers how to solve a particular problem in class passes an assessment/test item requiring solution of the same problem. The assessment/test measures retention of course content, but the learner may not be able to solve new problems on the job. The assessment/test did not measure how well the learner transfers what he or she learned to the job.

(2) Assessments/tests for retention or transfer depend on the kind of action (behavior) involved in the instructional objective. Retention assessments/tests use memorization, recall, or recognition assessment/test items. Transfer assessments/tests use recognition, production, or application assessment/test items. Table 11-4 summarizes the important differences between retention and transfer assessment/tests.

Table 11-4
Comparison of retention and transfer assessments/tests

Retention assessment/test characteristics	Transfer assessment/test characteristics
<ul style="list-style-type: none"> • Require the learner to demonstrate the retention of knowledge, and skills acquired during instruction. • Include the same examples and situations experienced in instruction. • Require the learner to remember what he or she encountered during instruction. 	<ul style="list-style-type: none"> • Require the learner to demonstrate the retention of knowledge and skills acquired during instruction, and the ability to apply them to new situations/examples not encountered during instruction. • Include different (novel) examples and situations.

(3) Retention assessment/tests require the learner to remember something presented in the instruction. Table 11-5 describes the three forms of retention assessments/tests.

Table 11-5
Types of retention assessments/tests

Retention assessment/test	Requirement	Assessment/test item examples
Memorization	<ul style="list-style-type: none"> • Write, state, or perform in exact terms. • Memorize exactly the content of the instruction—any deviation is an error. 	<ul style="list-style-type: none"> • Write the formula for water. • State the steps for removing the fuel pump.
Recall	Paraphrase or approximate what was learned during instruction.	<ul style="list-style-type: none"> • In your own words, define the term “discrimination.” • Demonstrate an acceptable method for starting a car.
Recognition	Look at or read alternatives and recognize the correct answer.	<ul style="list-style-type: none"> • Which of these two fuel pumps is correctly assembled? • Select the correct formula from this list.

(4) Transfer assessments/tests require the learner to memorize, recognize, or recall several intellectual and/or motor skills mastered during instruction, and apply these skills to new (novel) situations not encountered during instruction. For example, the learner may have to use learned rules to solve novel problems requiring the use of a formula or using specific procedural steps. To prepare for the transfer assessment test, the learner may practice on typical problems and review the objectives provided at the beginning of the course.

(5) Assessment/testing for transfer is not possible if the learner has access to the assessment/test items and learns only those problems on the test. Instructors should not teach the exact items that will appear on the test, or there is no inference that the learner will transfer what he or she learned. This would negate the purpose of the test—to see if the learner can apply learned intellectual or motor skills, to novel conditions. To ensure the integrity of this type of assessment/test, transfer assessment/test items require appropriate security.

(6) Transfer assessments/tests measure complex psychomotor skills. For example, in teaching a pilot to land a plane, it is not feasible to use all possible landing strip configurations. A good transfer assessment/test would sample from various classes of landing strip configurations to measure a learner’s ability to transfer learned psychomotor skills to conditions not encountered in training.

(7) Table 11-6 describes the three primary types of transfer assessment/test items.

Table 11-6
Types of transfer assessments/tests

Transfer assessment/test	Requirement	Assessment/test item examples
Recognition	Look at or read alternatives never encountered in instruction and recognize the correct answer.	<ul style="list-style-type: none"> • Which of the following (new) examples represent negative reinforcement? • Read the statement and select the specific answer that describes the statement.
Production	State or produce the correct answer or procedure when presented with a novel practical example or situation.	<ul style="list-style-type: none"> • Give an example of negative reinforcement not discussed in class. • Read the case study and state the specific disorder that describes the patient. • Select the best strategy for handling the mental patient described in the study. • Troubleshoot an equipment malfunction not specifically covered in instruction.
Application	Solve problems, using principles or procedures from the instruction, when presented with a novel practical problem.	<ul style="list-style-type: none"> • Read this case study of a mental patient, and using principles of reinforcement, generate a resource utilization strategy for managing the patient. • Generate tactics for landing an aircraft under conditions not encountered in instruction. • Perceive condition cues for job performance. Generate judgments as to whether a cue is an indicator of an abnormal or emergency condition and the probable cause of the condition.

(8) Design and development of a transfer assessment/test for concepts mastered during instruction presents additional challenges. Concepts have many examples of application—it is impossible to teach them all. A concept includes a grouping or class (classification) of events, people, objects, ideas (including values), or symbols. Members of a class share some common properties or attributes, and the individual members may be classified further according to different properties or attributes. Concepts are assessed/tested by creating examples that use the concept, and then selecting a sample of the example for use in the assessment/test. Guidelines to consider and follow are listed below.

(a) Develop a list of examples and non-examples of each concept taught in the course of instruction, according to their attributes. Determine the critical attributes all members of the grouping/class share. Determine the incidental attributes that might lead learners to make errors. (These properties could cause a learner to classify a non-example as an example incorrectly.) Base the numbers of these examples to use in the assessment/test on the difficulty the learners have in learning the concept. Use enough examples to vary each incidental attribute, and enough non-examples to exclude each critical attribute.

(b) Base the selection (sample) of examples and non-examples on the attributes of the members of the grouping/class of the concept. Some attributes are critical (that is, round objects roll). Other attributes are incidental (that is, round objects come in various colors). Distinguish examples and non-examples for a concept as follows:

(1) An example has the essential attributes of the concept. For example, for the concept “round,” rolling is an essential attribute. Since a ball rolls, it is an example of the concept round.

(2) A non-example lacks the essential attributes of a concept, although it may share some irrelevant attribute with other members of the grouping/class. Suppose all round objects presented to teach the concept round were red. A red ball is an example of round—not because it is red, but because it rolls. A red cube would be a non-example of round; it is red, but it does not roll.

(c) Determine how large a sample to use in assessing for transfer of a concept. Then, select the sample of examples and non-examples from a prepared list. The size of the sample depends on how difficult the concept is to learn. Many factors contribute to the difficulty of learning a concept. However, the following three are particularly relevant for developing an adequate transfer assessment/test:

(1) Number of members of a grouping/class. If learner performance requires distinguishing among a large number of members in a grouping/class, sample more heavily than for a class having only a few members. The more members there are in a grouping/class, the harder it is to see the essential similarities between them. A large grouping/class could have a dozen members.

(2) Number of critical attributes used to describe each member of the grouping/class. The larger the number of critical attributes the learner must know, the harder it is for the learner to see the essential similarities among the members of the grouping/class. For example, it is harder to classify objects based on size, shape, color, and texture, than based on color alone. When there are more than three critical attributes, sample more heavily.

(3) Similarity of critical and incidental attributes. The more similar the critical and incidental attributes, the more difficult it is for learners to identify only the correct members of the grouping/class. When critical and incidental attributes are similar, sample both examples and non-examples heavily. If critical and incidental attributes are dissimilar, sample less heavily.

(d) Ensure that learners correctly make the same response to a new example of the concept, which differs in some way from previously used examples of the grouping/class

members. For example, if one round object shown during instruction was a phonograph record, an assessment/test item might include another example, such as a dinner plate.

(e) Ensure that learners correctly make a different response to non-examples, which share some incidental attributes with the members of a grouping/class. For example, if all the round objects presented in instruction were red, an assessment/test item might include a non-example of a red cube.

(f) Use examples and non-examples during instruction to help the learner learn to include all true examples as members of the grouping/class of the concept. The learner also learns to exclude the non-examples and is better able to transfer what he or she learned to the job environment.

11-18. Criterion-referenced test development

a. Proponents develop assessments/tests using the following process:

(1) Review content resources to develop assessments/tests for all the objectives in the course of instruction.

(2) Determine the best type of assessment/test item for each objective.

(3) Develop assessment/test items for all the intellectual and motor skills in each objective.

(4) Develop retention assessment/test items for intellectual and motor skills covered in the instruction.

(5) Develop transfer assessment/test items for intellectual and motor skills not covered in instruction.

b. Proponents develop the CRT using the following steps:

(1) Translate objectives into assessment/test items.

(2) Develop the CRT items.

(3) Develop objective scoring procedures.

(4) Try out (validate) the CRT.

11-19. Criterion-referenced test characteristics

a. The Army uses a process called validation to ensure all assessment/test items have the necessary characteristics. Validation primarily ensures the validity and reliability of an assessment/test item.

(1) Validity is the degree to which an assessment/test measures what it is intended to measure.

(2) Reliability is the degree to which an assessment/test yields the same results consistently.

(3) Objectivity is an assurance the assessment/test is free from variations, due to factors other than the behavior measured.

(4) Comprehensiveness is the adequacy of an assessment/test to sample what is measured.

(5) Differentiation is the ability of an assessment/test to distinguish between levels of learning.

(6) Usability is an assessment/test that is easy to administer, score, and interpret.

b. Assessment/test validity is the relevance of an assessment/test to its purpose. Validity is the most important characteristic of an assessment/test and refers to two characteristics of assessment/test items:

(1) The extent to which assessment/test items are direct reflections of the objectives.

(2) The adequacy with which the assessment/test items sample the objectives.

c. Preparation of criterion-referenced objectives simplifies construction of CRTs. Criterion-referenced objectives describe intellectual or motor skill performance as follows:

(1) The conditions of intellectual or motor skill performance.

(2) The intellectual or motor skill performance required of the learner after instruction.

(1) The accuracy and/or time standards for intellectual or motor skill performance.

d. An assessment/test item is valid when it achieves the following directives:

(1) It requires the learner to demonstrate the intellectual or motor skill performance stated in the objective.

(2) It requires the performance of the intellectual or motor skill under the condition(s) stated in the objective.

(3) The score is according to the intellectual or motor skill standards stated in the objective.

e. The validity of the entire assessment/test depends on how well its items sample the learning objectives.

f. Reliability is the consistency with which an assessment/test measures the learner's mastery of the instructional objectives.

(1) If a criterion test is reliable, learners who mastered the objectives always pass, and those who did not always fail.

(2) If a criterion test is unreliable, a learner may pass or fail for reasons other than the ability to master the objectives.

g. The four main factors in CRT reliability are as follows:

(1) The assessment/test itself, including general and specific assessment/test instructions, and the conditions under which the assessment/test is administered.

(2) The learner taking the assessment/test.

(3) The scoring procedures.

(4) The length of the assessment/test.

h. Guidelines to maximize reliability for CRTs are as follows:

(1) Give the assessment/test under consistent conditions.

(2) Make instructions to the learner as clear and simple as possible. The CRT is not an assessment/test of the learner's ability to understand complex directions.

(3) Tell the learner how the assessment/test scoring works. Inform the learner whether speed or accuracy is more important, if there are penalties for errors, or if the assessment/test gives the learner simple credit for correct answers.

(4) Write all instructions, and make directions as complete as possible, without giving away answers to assessment/test items. Decide in advance how much information to provide the learner and include this information in written instructions.

i. The following procedures, used before and during assessment/test administration, maximize the reliability of the assessment/test results.

(1) Provide the assessment/test administrator with complete written instructions on all phases of assessment/test administration. These instructions should cover the following situations:

(a) How to answer learner questions and what to answer.

(b) How to lay out the equipment and supplies needed for the assessment/test.

(c) What to do in various circumstances, such as learner illness, equipment failure, or severe weather.

(2) Provide thorough training of the assessment/test administrator. The administrator should provide adequate supervision and conduct assessments/tests as prescribed.

(3) Ensure adequate supplies are available and equipment is in good working order. Failure to address these factors causes inconsistency in assessment/test results.

(4) Frequently inspect and calibrate the equipment and tools used for assessment/testing to ensure consistency of operation.

(5) Protect learners from extremes of environmental conditions that might affect assessment/test scores.

j. The learner may be a source of unreliability. Illness, fatigue, the stress of the assessment/test, and lack of motivation may contribute to poor assessment/test scores, even if the learner mastered the objectives. Learner success is maximized when the learner is rested and treatment during the assessment/test is designed to prevent the learner from becoming excessively afraid of failure. To best simulate the wartime task conditions for training purposes, more stressful conditions on a practical exercise or performance assessment/test may be appropriate. Such generation of stress is best situationally generated via immersion in a simulation, usually but not necessarily of high realism (for example, fidelity).

k. Ensuring consistent scoring of instructor or proctor-administered assessments/tests is challenging, particularly when multiple evaluators score learners on performance examinations. Using scoring checklists/keys for performance assessments/tests, or automated scoring for knowledge-based (predictive) assessment/tests, significantly reduces the possibility of assessment/test inconsistency.

l. For learner (self) administered assessments/tests, it is essential that all instructions are clear since the presence or availability of an instructor or proctor is not assured.

m. The key principle to observe in scoring is objectivity. Guidelines to achieve objectivity are as follows:

(1) Set precise standards and train the assessment/test administrator to apply them.

(2) Develop scoring procedures in which subjective judgment or opinion of the scorer is not a factor.

(3) Tell the assessment/test administrator exactly what to observe while scoring.

(4) Clearly state the standards of performance.

(5) Define successful performance so that measurements do not depend on personal judgments.

n. Specifying standards is essential to objectivity and reliability. The following items or performance indicators require standards:

(1) Intellectual skills based on a single correct answer.

(2) Psychomotor training requirements.

(3) Performance indicator that indicates if a learner did or did not do a particular thing.

(4) Performance indicator that indicates if a product exhibits the presence or absence of essential attributes.

(5) Performance indicator that indicates if specific numerical parameters for performing a procedure.

o. Additional ways to improve reliability are as follows:

(1) Ensure measuring instruments are accurate and calibrated.

(2) Have several scorers score one learner to validate scoring procedures.

(3) Identify the reason for any differences in scores.

(4) Make the standards more specific to correct differences in scores.

11-20. Turning learning objectives into assessment/test items

a. Derive valid assessment/test items from learning objectives that describe the performance required, the conditions of performance, and the standards required for speed and/or accuracy.

b. Compare each objective to the corresponding assessment/test item(s) to ensure each objective properly translates into the assessment/test items.

(1) Identify the inputs to the learner as specifically as possible (what the learner is given).

(2) Identify the correct learner process and output.

(3) Ensure the assessment/test items measure the learning behaviors and intellectual skills stated in the objectives, and the performance and measurement standards of the assessment/test items are consistent with the objective standards.

(4) Include a description of the assessment/test item (predictive or performance) that is appropriate for measuring the objective.

(5) Note whether the problem involves an assessment/test of a product or process for a performance assessment/test item.

(6) Specify the supplies and equipment needed for the assessment/test item.

(7) Specify the correct learner process for responding to an assessment/test item and the desired outputs for each assessment/test item, including a description of how to score the assessment/test item.

(8) Note what part of the learner's performance to observe for performance assessments/tests and note what to consider an error.

c. Have at least two SMEs review decisions about performance and knowledge-based assessment/test items. This ensures that the relationship between the objective and assessment/test item is as direct as possible. Ensure the following:

(1) The assessment/test item requires the learner to produce the exact performance the objective requires, and no other.

(2) There are no ambiguous assessment/test item statements.

(3) The conditions for observing the performance are the same in the objective and the assessment/test item.

d. Clearly communicate the question or problem to the learner. Develop assessment/test items using the following general guidelines. After developing the initial assessment/test items, request another review from a SME.

(1) Keep the language simple. The ability of the learner to comprehend difficult language ordinarily is not the skill in question.

(2) Inform the learner whether speed or accuracy is more important, and whether there are any time limits for the assessment/test or an assessment/test item.

(3) Consider using graphics, photographs, video, audio, or other instructional media for assessment/test items, when appropriate for clear communication or for directly relating an assessment/test item to an objective.

(4) Present the assessment/test items so they do not give the learner hints related to the correct answer.

(5) Include any instructions common to all assessment/test items in the general overall assessment/test instructions.

(6) Provide clear instructions to the assessment/test administrator. Specify what to say to the learner, and how to answer learner questions.

11-21. Sequence of development

a. Develop a performance assessment/test on all objectives that require the development of a skill/ability to determine a learner's level of performance on that skill/ability. Generally, in the sequence of development of assessment/test items, it is necessary to put resources toward the development of the performance assessment/test items (from the performance objectives) first. The rationale for developing performance assessments/tests first includes the following:

(1) Performance assessments/tests are the most important to actual job task performance. They assess/test most directly the performances (skills/abilities) closely related to actual required job performances.

(2) Performance assessments/tests provide insight into the prerequisite skills and knowledge that are trained and assessed/tested prior to attempting training/assessment/testing on full performance. As such, their development may highlight weaknesses in the task analysis process (for example, missing/unnecessary skills/knowledge) and missing objectives that need correction/writing.

(3) Performance assessments/tests assist to validate and assure the sequential and progressive sequencing of TLOs and the effective and efficient build of skills/knowledge into full performance. It is recommended to address any questions about the assessment or necessary corrections/additions with the task analyst/course designer before proceeding further.

b. After developing the performance assessments/tests (and making identified corrections to the objectives), write knowledge-based (predictive) items for those objectives that do not require performance assessments/tests (that is, for those TLOs which are pure knowledge). During development of the assessments/tests, it is possible to observe certain mistakes made regarding the construction or sequencing of the TLOs. Coordinate the necessary corrections with the task analyst/course designer before proceeding further.

11-22. Assessment/test development project steps

The primary (high-level) steps required for developing course assessment/testing documentation, procedures, and products are below.

a. Plan for developing assessments and assessment items.

b. Determine course assessment/testing policies and procedures.

- c. Write the assessment/test plan and ISAP.
- d. Construct and validate assessment/assessment items.
- e. Write assessment/test control measures.
- f. Implement assessment/test plan.
- g. Analyze assessment/test results.

11-23. Planning for development of assessments/assessment items

- a. Proponents should plan to manage the development of performance measurement/assessment/testing products. For new/revised courses, the TNGDEV may include a written assessment/assessment item development plan as part of the assessment plan.
- b. The requirements (who, what, when, where, and how) help develop the assessments/tests and the course assessment policy and procedures necessary to implement the assessment/testing instruments.

11-24. Determine course assessment/test policy and procedures

a. There are critical course assessment/testing policies and procedures assessed, compiled, revised, written, and eventually provided to the learner via the ISAP. Development of course assessment/testing policies and procedures considers the following areas. There may be cases when the COE/school or institution may not have discretion to develop their own policies or procedures (for example, if a higher HQ regulation exists which provides policies for specific types of courses).

(1) Pretests verify if the learner previously acquired the prerequisite skills, knowledge, and proficiency.

(2) The number of assessments/tests, retests, and remediation depends on the number of allowable assessment/test-remediation-reassessment/test cycles.

(a) IMI which, theoretically and by design, can retest an infinite number of times, until obtaining the mastery standard.

(b) The resources (including alternative media/methods, human resources, and time available).

(c) The resources expended to date (primarily time, as indicative of human, material, and financial investment to the learner).

(d) Time for remediation (retraining).

(e) Time between initial assessment/test and retest.

(f) Retest/recycle/retrain options and applicability.

(3) Assessment/test reclamation/feedback policy should include:

(a) Procedures for submitting these (when, how, time limits).

(b) Decision making processes and documentation.

(c) Actions upon acceptance/rejection.

(4) Elimination/dismissal procedures must clearly describe procedures, appeals, and decision-making procedures, and documentation for each.

(5) Recognition (honor graduate/commandant's list/other) should as a minimum, include procedures for determining honors, number of honorees, and total number of awards.

(6) Assessment/test scoring policy should include procedures, cutoffs, and mastery standard, by assessment/test.

(7) Cheating policy should include definition, learner's responsibilities, procedures, and actions.

(8) Assessment/test control includes all instructional activities to administer assessment/test instruments.

b. The process for acquiring course assessment/testing policies and procedures includes the following:

(1) List needed policy and procedures.

(2) Collect all existing governing policy and existing procedures mandated for the course.

(3) Obtain any waivers required.

(4) Transfer applicable policy/procedures to the assessment plan and ISAP.

(5) Collect/review alternative policy and procedures, from other courses/proponents, for non-mandated policy and procedures.

(6) Review/select/revise for applicability.

(7) Obtain review and approval.

(8) Transfer to the assessment plan and ISAP.

11-25. Write an assessment plan

a. In general, the assessment plan consists of the decisions made regarding what, how, and when the learners/students in the course are assessed/tested, including mastery/cutoff scores for each TLO. Unlike the ISAP, the assessment plan documents how and why critical decisions were made regarding learner/student measurement, and the source of the policies and procedures given to the learner/student in the ISAP. The assessment plan is not a work plan, such as the assessment/test development plan; it is a plan that documents how to implement the assessments/tests and includes policies and related SOPs. Unlike the ISAP, it may include sensitive information that requires appropriate controls.

b. The most critical decisions documented in the how-to-test area include determining, for each TLO, whether to use performance or knowledge-based assessment/testing and, if knowledge-based, the exact format the assessment/test items take (essay, completion, multiple choice, matching, etc.).

c. The primary determinant of whether to use performance or knowledge-based assessment/testing is the requirements (action, conditions, and especially standards) of the TLO. In making the decision, the team selects the best (most valid and reliable) method for the TLO, without consideration of resource constraints or extraneous factors, such as ease of grading or rank-ordering learners/students.

d. It is critical to document the decisions made on what, when, and how assessment occurs. For this reason, an audit trail is extremely important, to see at a glance the critical decisions made in these areas. For QC, there should be a completed audit trail document for each assessment/test development project, as an enclosure to the assessment plan.

e. Proponents should summarize this information and transfer it to the ISAP for learner/student review. The ISAP may refer to other documents containing assessment policy and procedures, as long as these documents are readily available to the learner/student.

f. Sequentially, the assessment plan has major sections that are initially incomplete until development of the actual assessment items and determination of the mastery standards. In some cases, sections may change because of test validation, material validation, initial operational trials, and subsequent implementation (including input from assessment/test critiques and analysis).

11-26. Write an individual student assessment plan

The ISAP is a product that includes learner/student responsibilities, graduation criteria, and the assessment strategy for each course or learning program. It describes in detail what will be assessed and the consequences for student failure to perform. It also describes the actions available to the student for redress and recourse in the event of performance failure or misconduct. It contains course test policy and students' responsibilities for completing the course or learning program. Proponents may upload the ISAP in step 23 of the lesson plan in TDC; however, it must be uploaded in step 18 of the POI. Proponents ensure ISAPs are complete and updated annually per TR 350-70. The following guidelines apply:

a. Develop and administer some form of assessment, for familiarization/briefing material where the viewer (the student) should retain information. At the start of these informational/familiarization events, inform students of the general learning expectations, procedures, policies, and whether or not students are tested.

b. Ensure all training and education designed in accordance with the ADDIE process has student assessment instrument(s) and a corresponding ISAP.

c. Provide the ISAP and explain to students during course orientation/in-processing their responsibilities during the conduct of the course or learning program. In certain integrated, multi-phase courses (usually for the Officer Educational System and Noncommissioned Officer Educational System) that may have common phases/modules and branch/MOS specific phases/modules different proponents create, develop and give two ISAPs to the students, or integrate the ISAPs into a single document. Coordination between the proponents is required to avoid conflicting policies/procedures.

d. Refer to the ISAP Development JA located on the TED-T website for steps to develop an ISAP.

11-27. Construct and validate assessment/test items

a. The development and validation of assessment/test items is a spiral process, involving the steps of construction, review, validation, improvement, revalidation, etc., until items are of sufficient quality to make instructional decisions. Based upon the workload of team members, proponents may simultaneously develop multiple assessments/tests covering TLOs in multiple content areas or courses.

b. The following process steps apply to assessment/test item construction:

(1) Adhere to sound assessment/test development practices in accordance with the guidelines in this Pam.

(2) Follow proper assessment/test validation procedures.

(3) Use SMEs and assessment/test design experts (including QAO/Quality Assurance Element (QAE) personnel) to review assessment/test items.

(4) Apply decisions recommended by experts and appropriate authorities.

(5) Document the decisions made, with rationale.

11-28. Construct and validate assessment rubrics

A rubric is an assessment tool used to establish a set of measurable criteria and rating scales to be used as an objective measure of if and how well the learner/student attained the learning objectives. Typically, rubrics define academic expectations for learners/students completing essays and performance assessments. Each rubric contains a graded aspect of each specific

element of the assessment instructions, clearly sets the expectations for learning assignments, and typically measures the learner/student's development of higher-level intellectual skills, according to the standards established in the learning objective (such as problem-solving, communication, higher order thinking). There is no specified format and rubrics are not all-inclusive. An example of a rubric is available on the TED-T website.

11-29. Write assessment/test control measures

a. The proponent follows control measures:

(1) Instructions provided to all instructional activities administering the assessment/test instruments.

(2) Guidance to assessment/test administrators on when to excuse a learner from an assessment/test, and under what conditions (such as equipment failure) to consider scores invalid.

(3) Controls for sensitive materials during the development, validation, and approval process.

(4) Procedures for secure transmittal of sensitive assessment/test material to the administering activity (to include coordinating with, or providing instruction to, other activities having a distribution role).

b. The proponent should conduct a risk analysis to specify the proper level of control for each assessment/test instrument during transmittal and implementation, based upon the following factors:

(1) Type of assessment/test instrument administered (performance or knowledge-based).

(2) Instrument's method of administration (for instance, instructor or evaluator/administrator presence (live or virtually)).

(3) Target population.

(4) Prior history/experience with like populations and assessment/test instruments.

c. Based upon the risk assessment, for each instrument/like instrument, the proponent that develops the assessment/test specifies only the minimum level of controls needed to protect only the sensitive assessment/test material from unnecessary risk of compromise. The determination of the sensitive nature of any particular assessment/test instrument or material is solely at the discretion of the proponent.

11-30. Implement assessment/test plan

Implementation of the assessment/test plan is a shared responsibility of the proponent and the administering activity.

a. The proponent:

(1) Provides clear assessment/test control and administration procedures to the administering activity.

(2) Prepares and provides assessment/test data collection instruments/means.

(3) Obtains assessment/test performance data and critiques.

b. The administering activity:

(1) Administers all assessment/test instruments in accordance with guidance the proponent provides (or, if not possible or if concerns arise, immediately contacts the proponent for guidance).

(2) Implements the appropriate assessment/test control procedures based upon guidance the proponent provides. This includes arranging reasonable security to prevent learners from receiving unplanned assistance or being disturbed while taking the assessment/test.

(3) Administers assessment/test reviews in accordance with guidance provided by the proponent and guidance contained in this Pam.

(4) Administers assessment/test critique instruments and provides data to the proponent. t.

(5) Provides recommendations or concerns for assessment/test improvement to the proponent.

(6) Consults the proponent for questions regarding reclaims.

(7) Develops a clear and detailed local SOP for assessment/test control.

11-31. Performance assessment/test development

a. Performance assessments/tests are the best method for the accurate assessment of an individual's overall proficiency. Developing good performance assessment/test items entails ensuring that the objectives are sufficiently specific, determining the level of assessment/test fidelity possible, determining scoring procedures, writing the items and instructions, validating the items and instructions, obtaining approval, and updating the assessment plan and the ISAP. These steps are not necessarily linear in their performance, as with most TED processes. Use of spiral development requires returning to previous steps for necessary corrections and improvements.

b. Performance assessments/tests require the learner to perform an overt action or series of actions, rather than verbalize or write (unless the required performance is speaking or writing). Table 11-7 compares written and performance assessment/test items.

Table 11-7
Comparison of written and performance assessment/test items

Written assessment/test items	Performance assessment/test items
Primarily abstract or verbal.	Primarily nonverbal.
Items address knowledge and content.	Items are skills, performances, or job related decisions.
Items usually address independent aspects.	Items are sequentially presented. Errors early in the sequence may affect later items.

11-32. Select, review, and revise performance objectives

a. When developing an assessment/test, a critical task is deciding not what to test (that is, the learning objectives), but how best to test the learning objectives. Usually, the performance objective clearly indicates the demonstration of performance, how to judge it as correctly performed, the conditions of performance, and number of successful iterations of performance required for mastery. If the performance objective includes all these factors, the developer duplicates the performance (action) called for in the learning objective, under the conditions (or a sampling of conditions) called for in the learning objective, with as high fidelity (match) as possible in the assessment/test item. The developer then assesses the performance, using the criteria in the standard of the learning objective.

Note. The TNGDEV’s task is similar; that is, provide learning opportunities that duplicate the action and conditions of the learning objective, and bring the learner to the level of the standards of the learning objective.

b. If the learning objectives are not specific enough, the TNGDEV may not be able to begin the assessment/test development process immediately. A lack of clarity may exist in the exact action the learner must be able to perform after training or instruction, the necessary/alternative conditions of performance, or the standards expected/possible within the training setting. In addition, the learning objective may match the individual critical task to such a degree that training and assessment/testing under the conditions, or to the standard(s) stated, are impossible or dangerous. TNGDEVs will not attempt to design assessment/test items from poor objectives; they will modify the objectives first, and then design the corresponding assessment/test items. A great deal of the design of a good performance assessment/test directly attributes to the quality of the learning objectives.

11-33. Design performance assessment/test items

a. Design of performance assessment/test items follows these steps:

(1) Determine whether there is a need for product measurement, process measurement, or both product and process measurement.

(2) Construct a checklist for product and process measures.

(3) Determine scoring procedures.

b. It is often impractical to reproduce a real job situation or provide actual equipment. However, critical job elements can be simulated via various means for training and assessment/testing purposes. For example, an electronic technician is required to check out circuits, and identify and repair malfunctions on a piece of simulated equipment. The assessment may sacrifice some of the reality of the work setting, but the critical job elements and specifically the wiring of the components found in complex electronic equipment are present. Thus, the recognition is that the assessment/test is a realistic representation of the tasks encountered on the job.

c. The match between the learning objective, actual assessment/test item, and on-the-job performance is called fidelity. The learning objective should indicate a high degree of fidelity (match) with the performance required on the job, and the assessment/test items should display a high degree of fidelity with the learning objective.

d. Determining the level of fidelity considers such factors as the time required to perform a given task, the type of equipment required, ability to present the task in a uniform (standard) manner, the risk of damage to equipment or personnel, and the ability to assess an individual's performance with a high degree of objectivity. These considerations impose realistic constraints on the level of fidelity of the performance assessment item. Often, compromises are necessary. Proponents may decide to limit the assessment/test to one or two phases of the task, instead of requiring performance of a complex task. For example, a limited assessment could consist of preparing only one slide of a biological specimen but identifying a larger number of mounted specimens. Another consideration is the use of computer simulations.

e. Use of computer simulation of psychomotor task performance in lieu of the use of actual equipment brings advantages and disadvantages. Its value is directly proportional to its ability to simulate the actual task. For example, if the task requires performance on, or with the help of, a computer, the level of fidelity is almost perfect, and there is no reason to acquire actual equipment. For procedural equipment tasks, it is appropriate to use computer simulation to determine the learner's readiness to practice and perform tasks on actual equipment. Certification of proficiency should take place on actual equipment if the equipment simulation is not at a very high degree of fidelity. Table 11-8 summarizes the advantages and disadvantages of using computer simulation of psychomotor task performance.

Table 11-8
Advantages and disadvantages of using computer simulation of psychomotor task performance

Advantages	Disadvantages
<ul style="list-style-type: none"> • Protects equipment and personnel from dangers inherent to using actual equipment. • Records actions/mistakes electronically for review. • Simulates numerous faults/situations easily. • Incorporates aspects of games for motivational purposes. • Scales objects to workable size. • Determines learner’s readiness to work with real equipment. • Allows possible release of equipment for operational purposes. 	<ul style="list-style-type: none"> • Provides only a two-dimensional representation of three-dimensional equipment (unless holographic). • Cannot train the feel of an action (no tactile response). • May not provide the same degree of urgency or criticality to perform correctly. • Does not match scale of actual objects.

11-34. Validation of performance assessment/test items

a. The validation of performance assessments/tests has four primary components: content validation, review of instructions, individual tryout of items, and master/non-master tryouts. Revision takes place where necessary, usually before proceeding to the next phase. In general, content validation and review of instructions occur before conducting individual and master/non-master tryouts.

b. After initial drafting of each item and instructions, active reviews by TNGDEV and SME personnel ensure that each element of the assessment/assessment item matches, or aligns, with the corresponding element of each learning objective. The process entails the following steps:

(1) Match the performance in the item requested of the learner during the assessment/test with the performance found in the objective, to verify content of the item.

(2) Match the conditions under which the assessment/test takes place with the conditions listed in the learning objective.

(3) Match the rating scale/checklist against the learning objective standard to decide its reasonable use at determining mastery or non-mastery.

c. For each item, a SME, other than one who participated in its development, reviews all administrative instructions (including instructions to the administrator, observer/evaluator, and actors) for clarity, understanding, and completeness. The SME may also review the learners’ instructions, but the individual tryout, using an actual learner, provides more information. TNGDEVs make necessary changes before going to individual tryouts. TNGDEVs document this review and its results.

d. Proponents follow the procedures listed below for conducting individual tryouts:

(1) Select an administrator, observer/evaluator, and actors from the likely pool of personnel actually administering the item.

(2) Obtain an untrained volunteer learner who best matches the characteristics of the target audience. A trained but untested volunteer is best but may be difficult to acquire.

(3) Train/provide instructions to administrators/actors in exactly the same way as during actual course assessment/test. If participants will receive written administrator instructions without the opportunity to ask questions of the developer, then present the instructions to the volunteers in the same manner. Collect comments for changes.

(4) Inform the volunteer assessment administrator that he/she should train the actors and evaluators (if that is part of administrator's duties). Provide assistance in training only if absolutely required and make note of problems/comments.

(5) Instruct the administrators/evaluators/actors to administer the assessment/test item(s) to the volunteer learner exactly according to the instructions given. Collect comments from administrators and learner.

(6) Make changes, as necessary, before proceeding to master/non-master trials. If there are changes to the content or instructions, conduct review of content and instructions. If the changes are significant, repeat individual tryouts for the item(s). Subject multiple items simultaneously to this tryout, following all the guidance above.

e. Master/non-master tryouts provide the first statistical indicator of the reliability of the assessment/test. The assumption is that true masters of the TLO will pass the assessment/test, and true non-masters cannot pass the assessment/test. After an assessment item is deemed acceptable, proponents use it for the conduct of individual and group trials on instructional materials. During the instructional material trials, they immediately correct any issues with any assessment item, to be able to use it for the instructional material evaluation and trials validation. Proponents collect any additional data to use in setting cutoff points, based on the type of assessment item used during these trials. Proponents use the following rules to try out multiple items at one time:

(1) Acquire at least five nonperformers (with critical characteristics of the target population) and five performers as volunteer learners. Accept self-assessment of mastery only if other evidence of mastery is not available.

(2) Administer item(s) to volunteers, following the written administrative instructions precisely. The administrators should answer only allowed questions from the volunteer learners. Stop the assessment/test if it is clear that a non-master cannot perform (or when failure is certain). Monitor for safety failures, especially from non-masters. Keep notes of mistakes masters make.

(3) Compute the discrimination index and apply rules. The Assessment Item Analysis JA, on the TED-T website, provides guidance on conducting a discrimination analysis.

(4) Repeat after making any substantial changes. Revalidate any changes made to correct deficiencies that caused a non-master to pass or master to fail.

(5) Document the results and obtain approval (if passed); include this documentation as part of the audit trail.

11-35. Review and revise knowledge/cognitive skills-based learning objectives

a. While reviewing all learning objectives, TNGDEVs identify objectives that are clearly cognitive (knowledge-based); objectives that are purely psychomotor performance and require evaluating via the assessment of a product or process; and objectives that are performance (cognitive skills) but are administered using a knowledge-based assessment format to collect and evaluate the learner's responses. TNGDEVs set aside the first and the last of these types for the development of assessments/tests using knowledge-based formats.

b. Knowledge/cognitive skills learning objectives frequently exhibit the same types of deficiencies as the learning objectives for psychomotor skills. That is, the learning objective components are not specific enough to begin the assessment/test development process immediately and require revision before proceeding. A lack of clarity may exist in stating the exact action the learner must be able to perform after instruction, the necessary conditions of performance, or the standards expected within the learning setting. Specific examples are below:

(1) The exact action the learner is expected to perform is unclear, usually because of overuse of the verb in the knowledge/cognitive skills objective (for example, describe), when another verb might make the objective clearer.

(2) Certain conditions are lacking—most notably a clear with or without references/notes/JAs condition and the specification of those references/aids.

(3) The standard is not specific (for example, standards frequently imply or state without error, and the real-world standard is less than perfect, and/or the cutoff scores are usually not set at a perfect level).

11-36. Design knowledge/cognitive skills assessment/test items

a. The following steps cover the design of knowledge/cognitive skills assessment/test items:

(1) Determine whether to use recall- or recognition-type items.

(2) Select the best format for the learning objective and required item type.

(3) Determine number to measure TLO/ELOs adequately.

b. An often overlooked step in the design of knowledge/cognitive skills items is to determine if the objective calls for the recall of information, or just the recognition. Recall objectives assume that the learner must recall, and state from memory without the presence of the correct answer, certain facts, procedures, policies, steps, etc. Recall formats do not provide the learner alternatives from which to choose the correct answer. On the other hand, recognition means only that the learner recognizes the correct answer when they see it. In a recognition format assessment/test item, the learner must select the correct answer from a relatively small set of given alternatives. An objective requiring the learner to identify something/someone is not necessarily a recognition item. The manner in which the learner delivers the answer determines recall or recognition. If the learner identifies and picks the correct name from a list (or drags-and-drops the correct name), then the item is recognition. If the learner identifies the name by writing it without options to choose from, then it is a recall item.

c. Recall type items include essay, short answer (or long answer), completion, including fill-in-the-blank, and labeling (not drag-and-drop). Recognition formats are drag-and-drop, matching, and multiple-choice.

d. Recall assessment/test items are the better measure of true knowledge/cognitive skills acquisition and mental ability, since no hints (the correct answer) are present in the item. The learner retrieves the answer from memory. Recall formats are better for three other reasons.

(1) Recall-type items eliminate the possibility of guessing the correct answer.

(2) Recall items (correctly answered) provide better retention.

(3) Good recall-type items are easier to construct. For example, it is more difficult to construct a good multiple-choice question with no design flaws, and the required three to four reasonable distracters (incorrect answers), than to ask the question directly.

e. Recall-type formats are the more valid measures, whether they solicit knowledge or cognitive skills (performances). A cognitive skill item that asks a learner to demonstrate skill by writing in an answer is usually better than one that requires selecting the correct answer from a number of choices. The learner may know absolutely nothing about how to solve the problem but may eliminate (because of construction problems) several given alternatives, and then have a good chance of correctly guessing the answer.

f. Use of recall or recognition items is in accordance with the following guidance:

(1) Use recall items for all learning objectives (knowledge/cognitive skills) that are critical for safe task performance and critical wartime mission accomplishment. This requires a review of the job and task analysis information to see which performance(s) (tasks) and/or the performance objectives the knowledge/cognitive skill supports. Proponents may use recall items for all other learning objective assessment items.

(2) Use recognition items if, and only if, the assessment/test item is relatively noncritical, and the characteristics of recall objectives sufficiently outweigh their decrease in measurement

value. This is a conscious decision that requires approval by the appropriate designated COE/school or learning institution official.

(3) Do not use recognition items solely because of their perceived ease of grading. State-of-the-art word recognition and matching software facilitate grading of recall assessments/tests.

g. If assessing/testing for recognition is sufficient to meet the learning level of the learning objective, TNGDEVs construct multiple-choice, matching, or drag-and-drop (another type of matching) items. If the objective needs recall, use of essay, completion, short answer/fill-in-the-blank/labeling is appropriate.

h. TNGDEVs use the following guidance to determine how many assessment items to develop for measuring cognitive skills or knowledge:

(1) Usually one assessment/test item can measure acquisition of one piece of knowledge. Matching items might measure several pieces in one item.

(2) If the objective calls for only one piece of knowledge (for example, “Write Ohm’s Law”), then one assessment item might measure it adequately. Developing multiple versions of the item allows for its use in pre-assessments/tests and for alternate versions of the post-assessment/test.

(3) If assessing/testing several ELOs, at least one item (with several versions) for each ELO is required.

(4) Measuring whether the learner knows a series of steps may require multiple assessment items to thoroughly assess knowledge of all steps (that is, if each step requires different skills/knowledge).

(5) For critical cognitive skills, using one item may not suffice to verify mastery. The SME expertise determines how many items or different trials to use. For example, an objective like “determine the number of matching points for two fingerprints,” requires multiple trials.

11-37. Validate knowledge/cognitive skills-based assessment/test items

a. The three primary steps of knowledge/cognitive skills-based assessment/test item validation are described below:

(1) Conduct a content review to ensure the assessment/test items match the content and objectives (establish and verify content validity). The level of learning of the assessment must align with that of the TLO. For example, if the learning level of the TLO is analysis, then the learning level of the assessment must be at the analysis level.

(2) Conduct a construct review to ensure the application of best practices and avoid flaws in assessment/test item design (establish and verify construct validity).

(3) Conduct assessment item analysis to determine if an assessment/test item can distinguish between masters and non-masters. The Assessment Item Analysis JA, on the TED-T website, provides guidance on conducting a type of assessment item analysis known as discrimination analysis. The application of the procedures above should result in a determination that the items have sufficient validity for use in learner assessment and mastery determination.

b. Another data source to improve assessment/test items is the comments from instructors and learners during any administration of the items (that is, during try-outs or validation trials and implementation), and the actual performance of the learners. TNGDEVs analyze this data to determine if there were any problems with the assessment/test items undiscovered through the above validation processes.

c. Content validity is a measure of how closely the content of the assessment/test instrument relates to the content of the instructional product it measures. The following steps describe the process for verifying content validity:

(1) Associate directly both the assessment/test questions and the course content with specific instructional objectives.

(2) Sample systematically the content domain using formal task analysis methodology.

(3) Use the task analysis process to form the basis for instructional objectives by identifying the content domain tasks and subtasks.

(4) Describe the degree of content validity in terms of the comparison between or the correspondence among course objectives, course content, and assessment/test questions.

d. Evidence of the degree to which an assessment/test has content validity stems from a combination of the following actions:

(1) The comparison of assessment/test items with course content.

(2) The comparison of assessment/test items and course content with learning objectives.

11-38. Analyze assessment/test results

The proponent collects and analyzes assessment/test performance data, assessment/test critique data, and instructor-initiated recommendations. The proponent's QAO/QAE office, or other individuals/activities in the proponent's activity, may perform actual compilation and analysis of performance data, assessment/test critique data, and instructor-initiated recommendations. It is highly recommended, at the least, to consult the QAO/QAE for assistance in data compilation, analysis, and interpretation; and subsequent decisions about changes/improvements to assessment/test instruments, materials, and assessment/test administration processes. Involving TNGDEVs and SMEs in revisions to course assessment/testing instruments, products, and procedures is recommended. The COE/school and institution (in coordination with the local QAO/QAE) ensure the defining and institutionalizing of the procedures and processes, for the

effective collection and analysis of data, and the implementation of subsequent changes, as described within this chapter.

Chapter 12

Evaluation, quality, and accreditation

12-1. Evaluation, quality, and accreditation overview

Quality learning products are vital to producing quality institutional training and education that conforms to established standards, achieves the desired objectives and outcomes, and meets the needs of the Army. Evaluation, quality, QA, and QC should be employed throughout the ADDIE process to ensure achievement of the highest possible quality learning products. These functions are not synonymous, as each has a distinct purpose within the Army Learning Enterprise. A brief description of each follows.

a. Evaluation is an integral step in all phases of the ADDIE process, done to assess the quality (efficiency, deficiency, and effectiveness) of the learning products and processes before and after implementation. Evaluation also applies at the program level to determine the worth of the learning program, determine if objectives have been met, and/or assess the value of a new technique. An evaluator provides information and/or recommendations to the appropriate leadership/management to inform any decisions on actions to improve the learning products, processes, or programs. In order to do this, the evaluator has to collect appropriate data and conduct data analysis/interpretation. Army educational institutions conduct formal evaluations of their academic programs every three years in accordance with TR 350-70 and TR 11-21.

b. Quality is the timeliness, accuracy, and conformance to specified standards for products, processes, and/or programs. Quality is not an attribute added later; it is a standard engineered into a process. It is the goal at all stages of development and achieved through continuous evaluation during each phase of the ADDIE process. Built-in checks in each phase ensure the quality of the ADDIE process and instructional products, with emphasis on the unit or graduate performance.

c. QA is the function involving evaluative processes that assure the command that training is efficient and effective, and meets the current and future training, education, and leader development needs of the operational force. The primary aim of QA is to furnish the chain of command with the confidence that TRADOC achieved its mission, while minimizing risk of error or failure. It provides an oversight function for increasing organizational effectiveness, efficiency, and economy. QA is achievable through decisions based on results of accreditation, internal and external evaluation, and QC functions. The objective of QA is to:

(1) Provide the Army with the maximum return on investment.

(2) Ensure and maintain quality up-to-date products to fulfill the needs of the Army.

(3) Deliver quality-learning products in a timely manner and in compliance with DA and TRADOC policy.

d. QC is an evaluative action or event, conducted to affect QA, that ensures all development and implementation procedures and processes, and the resulting Army learning products, meet or exceed prescribed standards. Every QC activity provides a degree of QA. QC begins with the prescribed minimum quality standards for the relevant product or process. Within ADDIE, a series of QC mechanisms/checks apply to the development of all learning products, procedures, and processes. These checks may be formal or informal.

12-2. Types of evaluation

In the Army's ADDIE process, evaluations are classified as formative (before and during implementation), summative (after implementation), internal (evaluation data collected from inside the training/education organization), and external (evaluation data collected by someone within the organization, or from sources outside the organization). Moreover, formative (before implementation), and summative (after implementation) can be considered internal and external evaluations as well and are considered sub-sets of formative and summative evaluations, respectively.

a. Internal evaluation is the evaluation process that provides the means to determine whether the training and training development efforts have accomplished what was intended. It determines if the objectives of the training have been met and verifies the effective use of the ADDIE process to meet minimum essential analysis, design development, implementation and evaluation requirements. See AR 350-1 for more information.

b. External evaluation is the evaluation process that provides the means to determine if the training and training products received meet the needs of the operational Army and the training institution continues to produce graduates and training products that meet established job performance requirements. See AR 350-1 for more information.

c. The monitoring of a learning product as it proceeds through the ADDIE process to make sure the product achieves the desired outcome/objective. This is a check-on-development to control the quality of the learning products developed and their implementation. Chapter 6 contains guidance for course QC, and chapter 7 contains guidance for lesson/lesson plan QC.

12-3. Internal evaluation

a. The purpose of an internal evaluation is to improve the quality and effectiveness of the instructional system by providing sufficient, high-quality data to decision makers upon which they can make sound, informed decisions about the training and education. During an internal evaluation, internal feedback and management data are gathered from the education/training instructional system environment. Periodic internal evaluations may identify weaknesses/problems as well as strengths of the learning product development and instructional system. Internal evaluation is a deeper requirement than checking MOI and instructor techniques. It is a check of the quality of the content taught and what the learners are assimilating. An internal evaluation makes comparison between the course objectives and standards applied in the learning environment, and the objectives and standards specified in course development documents. An external evaluation ensures the proper application of the learning product development process.

b. An internal evaluation can be conducted on learning products during and after they are developed. An internal evaluation of the implementation of training is conducted when and where the training is implemented.

c. Internal evaluations provide COE/school decision makers with a method of ensuring that learning and learning products are correctly developed and implemented in accordance with the appropriate ADDIE standards. See COE/school responsibilities in the Internal Evaluation JA on the TED-T website.

d. Competent management is key to an effective evaluation. Management ensures that all aspects of the internal evaluation are fully integrated. Internal evaluations are specifically focused on answering the following questions:

(1) How good is the training and education?

(2) Are learners learning?

(3) Has the TED process, the process of developing, integrating, prioritizing, resourcing and providing QC/QA of the Army's training and education concepts, strategies and products to support the Army's training and education of RA and RC Soldiers, Civilians and units across the institutional, self-development and operational training domains been applied?

(4) Is it necessary to change anything?

e. During internal evaluations, the learning institution may find deficiencies over which it has limited control (such as when a classroom is overcrowded). Correction of deficiencies may depend on support from a higher HQ. In such cases, it is imperative to bring these issues to the attention of the senior leadership and report them to higher HQ. TNGDEVs maintain documentation of proponent reports to higher HQ and their response to issues.

f. Evaluators should refer to the Internal Evaluation JA on the TED-T website for examples and general procedural guidelines for conducting internal evaluations.

12-4. External evaluation

a. External evaluation determines if Soldiers and DA Civilians can meet job performance requirements, if they need all the instruction they received, or if they need any additional instruction they did not receive. This process gathers data from the field to assess a graduate's on-the-job performance in a job environment and assess if the Soldier can satisfy real-world job performance requirements. Evaluators must realize that the responses to the surveys are opinions of Soldiers/leadership in a specific unit configuration that may or may not relate to wartime or battlefield requirements and may or may not be in a peacetime environment. Likewise, it is important to compare what the Soldiers/leadership say with regard to a particular task or objective, with what other documentation indicates is necessary to support a particular unit mission, equipment configuration, and/or operations capability.

b. External evaluation is the process that provides the Army the means to determine if the training and education received meet the needs of the operational Army. This evaluation ensures the system continues to efficiently and cost-effectively produce graduates who meet established job performance requirements. External evaluations are a quality improvement operation, ensuring Soldiers, Civilians, and learning products continue to meet established job performance requirements, as well as continually improve system quality.

c. External evaluations should be conducted on Soldiers and/or their leaders after the individual has graduated from a course and is performing his or her job/duty in the unit. When conducting external evaluations, evaluators look for both strengths and weaknesses of the training system.

d. Due to lack of resources, many proponent schools can no longer afford to send evaluation teams to units to evaluate the validity and effectiveness of learning/learning products. Therefore, CTCs have become a critical source of that information. The CTC program provides highly realistic and stressful joint and combined arms training in accordance with Army and Joint doctrine. CTC rotations and reviews provide an invaluable source of feedback that may influence the determination of unit missions, critical collective and individual tasks, and collective and individual task analysis data used in the development of learning products. Any feedback from CTCs should trigger the proponent to revisit analysis and product revisions.

e. Most Army schools use online survey software to conduct an external evaluation. Telephonic surveys and focus groups may also be used. Using online survey software provides the following benefits:

(1) Saves resources (time and money). Eliminates the requirement to print and distribute paper evaluations. No travel is required to reach out to large global audiences. The COE/school has immediate access to results that they can use to make improvements.

(2) Facilitates survey design and updates. A COE/school can design a survey to focus on their current needs and can easily edit/update the survey as well.

(3) May eliminate evaluator bias.

(4) May offer software tools that assist in analyzing results.

f. Management is key to an effective evaluation. Management ensures that all components of the evaluation are fully integrated. External evaluations are specifically focused to obtain answers to the questions “How good are our graduates?” “How good are our training support products?” and “Is it necessary to change anything?” Evaluators should refer to the External Evaluation JA on the TED-T website for other questions, examples, and general procedural guidelines for conducting external evaluations.

12-5. Evaluation process

a. The evaluation process appraises quality (efficiency and effectiveness) of Army learning products, processes, and programs. The evaluation process phases are planning, collecting, analyzing, reporting, and follow-up.

b. The evaluator follows the phases of the evaluation process and ultimately identifies, articulates, and provides information to Learning Enterprise leadership to assist them in making training/education decisions. These decisions could include whether to continue training, whether and how to improve the training, and/or whether the training is cost effective. Evaluation provides QC checks throughout the entire ADDIE process. Evaluators look for both strengths and weaknesses in the entire instructional system. Education/training evaluations focus on the following areas:

(1) How well the graduates are meeting job performance requirements.

(2) Whether the COE/school is providing instruction that graduates do not need to perform the job.

(3) Whether the COE/school is not providing instruction that graduates need to perform the job.

(4) Ways to improve the graduates' performance on the job, as well as the instructional system.

(5) How well each instructional system component is contributing to overall instructional system quality, including but not limited to lesson plans, instructors, equipment, training devices, interactive courseware, training schedules, audiovisual media, facilities, manpower, and costs.

(6) Whether the COE/school is appropriately applying the ADDIE process.

(7) How efficiently the education/training products meet the identified needs.

c. Evaluators support decision makers at all levels by assisting with the following activities:

(1) Collecting, analyzing, evaluating, and distributing feedback concerning such areas as listed below:

(a) Quality of current training and training support.

(b) Sufficiency of doctrine.

(c) Operability and maintainability of equipment and weapon systems from a field user's viewpoint.

(d) Readiness to meet new training requirements.

(2) Providing standards and guidance for evaluating and accrediting Army training, training products, and institutions.

(3) Identifying performance deficiencies.

(4) Providing successful initiatives from the collection and analysis of trends data.

(5) Determining if the quality of training meets the following criteria:

(a) Instruction follows objectives and implementation procedures listed in the lesson plan, CMP, student assessment plan, and the approved POI.

(b) Training aids used in classrooms support the objectives, are appropriate, understandable, and readable.

(c) Environmental conditions contribute to a proper learning environment.

(d) Instructor performance meets instructional standards.

(e) Training development and training management are effective and efficient.

(f) Collective training products are effective and efficient.

(6) Ensuring staff and faculty have received required training.

d. An evaluator observes, provides guidance and assistance while ensuring the COE/school applies a quality process to produce quality products. Executing an evaluation as a team effort is the most effective way to accomplish this process. Building the team should involve a matrix management approach. The team will consist of a project leader and SMEs (for example, TNGDEVs, Soldiers in units, instructors, task performers, and their supervisors). Depending on the purpose of the evaluation, the other team members will vary (in other words, ad hoc teams are built on the requirements of what is being evaluated).

e. The evaluation team needs a variety of people during the evaluation process, but the number and mix of personnel will vary based on the evaluation.

f. Evaluators must have unfiltered access to decision makers, and the evaluation findings, conclusions, and recommendations must be credible to be useful.

g. Evaluators conduct evaluations by analyzing the current status of unit and individual performance, training products, programs, and processes by using a five-phased process (planning, collecting data, data analysis, providing recommendations/reporting findings, and, when applicable, following up on recommendations to ensure implementation). This process produces valid and reliable results that identify training deficiencies. Findings identify those areas that are performing efficiently and effectively and provide the basis for corrective recommendations through the chain of command.

h. Evaluations require thorough planning. Some routine evaluation duties, such as conducting a classroom observation, reviewing a test, or analyzing a group of learner end-of-course critiques, do not require in-depth evaluation plans. A local SOP or equivalent document describes procedures for performing these routine duties. However, major evaluations (such as in-depth evaluations of school learning programs, products, or processes) require an evaluation plan that completes the planning phase.

i. The data collection process involves determining what type of data are required, what data to collect (learner performance, learner feedback, audit trails, etc.), where/from whom data are collected (source), how data are collected, and how much data are collected (method/technique/instrument). The next step is developing the collection method/instrument. The final step is to administer the instrument/technique to collect the data.

j. Analysis is the process of reviewing, synthesizing, summarizing, and processing evaluation data collected to develop initial findings concerning the item evaluated. Analysis reduces the huge volumes of raw data collected into a series of initial findings. The method used will depend on the types of data collected.

k. After collecting and analyzing evaluation data, the next step is to identify major findings and recommendations. The resulting evaluation report documents the following elements:

- (1) References.
- (2) Background/problem.
- (3) Purpose of evaluation.
- (4) Summary of data collection procedures.
- (5) Results (major findings, conclusions, and recommendations).

l. If needed, a follow-up phase determines if the COE/school implemented the recommendations. Once the evaluation is complete, it must be determined if a follow-up phase is required and the date of the follow-up must be set. This phase should take place within one year of the evaluation approval.

12-6. Planning evaluations

a. The first step to any evaluation is thorough planning. The Planning and Evaluation JA on the TED-T website provides steps for developing a project management plan. In addition to the planning steps identified in the JA, evaluation planners identify the purpose of the evaluation, all major evaluation questions/ goals/objectives, proposed data collection techniques, information or documentation needs, support resources and capabilities, operational timelines, support tasking requirements, the stakeholders who should be involved in the evaluation, the methodology to be used and the design of the evaluation. There are several reasons to carefully plan an evaluation

and prepare a written evaluation plan before conducting an evaluation. Planning does the following:

- (1) Helps ensure there is a valid need for conducting the evaluation (in other words, reduces the chance of doing an evaluation that is not required).
- (2) Focuses the intent of the evaluation and prevents the evaluation from getting off topic.
- (3) Forces the evaluator to think through the entire evaluation and plan for all actions required.
- (4) Identifies and optimizes the use of the limited resources available for conducting the evaluation.
- (5) Ensures that everyone involved in the evaluation receives notice of and knows his or her responsibilities.
- (6) Identifies and prioritizes initiatives.

b. Thorough planning is imperative to the success of a well-conducted evaluation. The complexity of the evaluation determines the amount of planning required. Routine evaluations may not require an in-depth evaluation plan. However, major evaluations of learning programs, products, or processes may require a more comprehensive or in-depth evaluation plan. The product of a well-instituted planning effort is an effective and efficient evaluation plan. The two types of evaluation plans that learning institutions develop are evaluation project management plans and master evaluation plans (MEPs).

(1) Evaluation project management plans are the individual plans developed for each evaluation conducted. They support the Army QA Program MEP. Evaluation project management plan formats range from informal, simple, and unwritten (the project requirement may exist in a database, but not as a formal report) to formal, detailed, and complex.

(2) The MEP is the planning document that provides all evaluation requirements for the next FY and projections for the following three years. Evaluation requirements outlined in evaluation project management plans are included in the MEP. TR 11-21 and other Army QA Program policy documents provide more information on MEPs.

c. There are six major steps to plan an evaluation. These six steps apply to the production of an evaluation project management plan.

- (1) Determine what areas need evaluating.
- (2) Define the purpose of the evaluation.
- (3) Determine the scope of the evaluation and available resources.

(4) Collect and analyze information pertinent to the evaluation (feedback and learning documentation, results of learner assessments, POI, STP, TSP, critical task lists, etc.).

(5) Develop, coordinate, and write an initial evaluation project management plan.

(6) Develop, coordinate, and write the final evaluation project management plan.

12-7. Collecting evaluation data

a. During the planning phase for evaluation, the evaluator identifies the information required to address the overall evaluation effort, as well as how to collect the required information. Data collection is the process of gathering, collating, and preparing data for the purpose of processing and analyzing to obtain results. Analysis of the data collected will determine the worth of any training, training product, or process. Relevant data should come from several sources, with more than one method used to collect data. General data collection sources and methods are document reviews, individual interviews, group interviews, surveys, tests or time trials, and personal observations. The intent is to collect sufficient raw data to ensure a successful analysis. The techniques or instruments used will depend on the type of data required for collection. See the Collecting Evaluation Data JA, on the TED-T website for general procedural guidance on collecting evaluation data.

b. The two types of data are quantitative and qualitative.

(1) Quantitative data indicate an amount (how much or how many) measured on a numerical scale. A quantitative approach is objective and reliable.

(2) Qualitative data (to be aggregated) are usually textual. Analysis of qualitative data usually focuses on trending verbal comments which can be converted into categories or themes (pre or post).

c. Data collection instruments contain some style of questions designed in a systematic, highly-defined approach. The purpose is to obtain consistent data for comparison, summarization and, if the data are quantitative, statistical analysis. Evaluators use a single or combination of collection methods to collect data. Evaluators obtain evaluative data from sources previously discussed. Some of the primary methods for collecting data are questionnaires/surveys, interview guides, observations, tests or timed trials, learner critiques, instructor questionnaires or interviews, examination of learning documentation and publications, and reports. Regardless of the data collection instrument used, evaluators administer those designed to research learning transfer to the job, to the graduate or their leadership, at least six months after the graduate's return to duty.

d. Providing accurate data to senior leadership requires determining how many completed surveys are required to produce a reliable report. Additionally, there is a need to provide senior leadership with the confidence that the information collected is representative of the target population.

e. Regardless of the collection data instrument used, evaluators must ensure evaluations meet these conditions:

- (1) Everyone involved understands the purpose of the evaluation.
- (2) Evaluators design data collection instruments to collect required data.
- (3) Data sources provide appropriate, pertinent, and reliable information.
- (4) Evaluators validate instruments prior to distribution.
- (5) Evaluators determine an acceptable sample size to collect sufficient data.
- (6) Evaluators choose the appropriate sampling technique in order to select a simple or a stratified sample of the target audience.

12-8. Preparing and analyzing evaluation data

a. The analysis process transforms large volumes of raw data collected into usable findings. Simply stated, analysis is the process of reviewing, summarizing, and processing information to develop initial, sound findings/recommendations concerning the issue evaluated. This analysis is not the same as the analysis phase of the ADDIE process. Before starting an analysis of collected data, evaluators perform the following actions:

- (1) Collect data from a sufficient and appropriate sampling/reliable source.
- (2) Collect an adequate amount of data samples to ensure the reliability of the findings.
- (3) Consider notes made by respondents on questionnaires or answers to supplemental questions included in the questionnaire.
- (4) Employ critical judgment of data that contain the halo effect (indiscriminate rating of all items positively) or central tendency (indiscriminate rating of items in the center of the scale).
- (5) Collect data for electronic analysis in an easily processed form.

b. Evaluators ensure data are valid and reliable. Triangulation (using multiple methods to study the same thing) can corroborate evidence and increase validity, especially for qualitative findings (see paragraph 5-9). The following are examples of events that could result in invalid and unreliable data:

- (1) Different data collectors conducting interviews or observations (resulting in different interpretations).
- (2) When someone other than the evaluator, who conducts the observation, interprets the recorded notes.

(3) A questionnaire that is incomplete, illegible, or ambiguous.

c. Evaluators check data for integrity as a part of every evaluation, especially when there were several data collectors involved, questionnaires were mailed, or an unstructured data collection method was used. It is crucial to check data for integrity when there is less control on how they are collected. When reviewing data for integrity, the evaluators ensure the responses are complete and understandable.

(1) Complete responses. A blank next to a question could mean the respondent did not know, the respondent refused to answer, or the question was not applicable.

(2) Understandable responses. The data collector's written response to an observation or the answer provided by the survey taker should be understandable.

d. Evaluators collect adequate data samples to ensure the validity of the findings. Reviewing data for validity means ensuring the responses are consistent, uniform, and appropriate.

(1) Consistent responses. Different questions, pertaining to the same subject, on the same instrument, are consistent (ask the same question in two different ways to see if the same answer is obtained). When using a rating scale for rating a list of items, evaluators look for patterns of responses that may indicate the respondent did not seriously answer the question.

(2) Uniform responses. Different data collectors administering interviews or observations, follow uniform procedures for collecting and recording data.

(3) Appropriate responses. If a response does not pertain to the purposes of the evaluation or the question asked, evaluators discard the response. If integrity problems are not resolved, evaluators discard the data.

e. Evaluators, before analyzing any data, enter all quantitative data in a computer, and summarize and condense all qualitative data into categories or themes, keeping in mind exactly why the data are being analyzed (in other words, they identify what specific questions are needed). A method for summarizing large amounts of qualitative and quantitative data is to use an automated statistical program.

f. Evaluators often use descriptive statistics to characterize data collected. Common descriptive measurements are:

(1) Mean is the average value.

(2) Range is the extreme values (lowest and highest).

(3) Standard deviation is the degree to which values are dispersed.

g. Evaluators interpret the analysis in common sense terms and explain the results. Interpretation of analysis is one of the most difficult steps in this phase of evaluation. Evaluators

should keep in mind the purpose of the evaluation during interpretation of data results. Evaluators annotate all trends identified and include them in the final report. Qualitative data are often considered less objective than quantitative data but can provide very useful information when looking at themes and relationships at the case level. Quantitative data, though more scientific, require statistical manipulation to represent findings. As with analysis, interpretation of results may call for the use of unfamiliar statistical procedures. Evaluators should solicit the assistance of a statistician, or more experienced evaluator, when using unfamiliar statistical methods.

12-9. Preparing evaluation reports

a. Evaluation report descriptions. Formal and informal reports are an ongoing process during the life of an evaluation and should not be considered as just end-of-evaluation products. Evaluators establish the primary audience during the planning phase and write the report to that audience's interest. The report should be concise and presented in a way that will ensure the evaluation information is used to its fullest potential. The report summarizes the results of the evaluation (such as findings, conclusions, and recommendations). Evaluators provide the completed report to senior leaders for their information and guidance.

b. Evaluation report length and format. The length and format of an evaluation report can vary significantly. Factors to consider are the audience for whom the report is intended, complexity of the evaluation, and/or the impact the evaluation results will have on the organization. The two types of reports are the EXSUM and the detailed evaluation report.

(1) EXSUM. The EXSUM is a synopsis of the evaluation and requires a response to the evaluation recommendations. Evaluators archive the supporting data and documentation required to explain and support findings. See TR 1-11 for EXSUM format and information. The EXSUM is designed for senior leadership that includes the following sections:

(a) Background.

(b) Purpose and objectives.

(c) Methods.

(d) Major findings, recommendations, and who is responsible to implement (or lead the implementation of) recommendations.

(e) Suspense date for a response to recommendations.

(2) Detailed evaluation report. Detailed evaluation reports are lengthy, formal evaluation reports that explain those findings included in the EXSUM listed above. In addition to the items in an EXSUM, the detailed report includes the following elements:

(a) An EXSUM.

- (b) A discussion of limitations.
 - (c) A list of assumptions.
 - (d) An identification of essential elements of analysis.
 - (e) Appendices for data summaries, such as data collection instruments and/or the evaluation plan.
 - (f) A memorandum requesting concurrence on the recommendations from the director and the organization responsible for implementing recommendations.
- (3) Detailed report. For most evaluations, the EXSUM is sufficient; however, a detailed report is necessary if any of the following conditions apply:
- (a) Intended audience is outside the installation, and an in-person explanation of the evaluation specifics (to include supporting data) is not feasible.
 - (b) Evaluation will have a significant impact on training/training resources.
 - (c) Evaluation involves complex data collection or analysis methodologies that require explanation.
- c. Report preparation steps. Evaluators may use the Preparing Evaluation Reports JA on the TED-T website for preparation of evaluation reports.
- d. Report guidance. TR 11-21 and associated Army QA Program documents provide guidance on preparing evaluation reports based on the types of evaluation conducted.

12-10. Conducting evaluation follow-up

- a. The follow-up phase is a crucial part of the evaluation process, but often overlooked. Evaluators conduct a follow-up to determine if the COE/school implemented recommendations and determine if the recommendations resulted in an improvement to the training and education.
- b. The primary goal of a follow-up is to ensure the organization has implemented the actions. How evaluators conduct of a follow-up depends on the actions themselves, resources available, and local policy. The follow-up should take place within one year of the evaluation approval. Follow-up measures may include the following actions:
 - (1) Meeting with personnel from the organization.
 - (2) Observing training and education.
 - (3) Reviewing training and education documentation.

(4) Examining training and education records.

c. Evaluators should refer to the Conducting Evaluation Follow-Up JA on the TED-T website for examples and general procedures for following up on evaluation reports. TR 11-21 and associated Army QA Program documents provide guidance on follow-up for issues identified on Army evaluation reports.

12-11. Accreditation

a. Accreditation is a QA Program function that helps to assure the command that the COE or learning institution's DOTMLPF domains enable the institution to develop Soldiers and leaders with the competency needs of today's Army. It focuses the commander's attention on the state of the institution's on-going programs and processes across its DOTMLPF domains as measured against TRADOC-approved Army accreditation standards. It is a forcing function to implement new Army initiatives. Accreditation of Army COEs and learning institutions will be conducted using the AEAS.

b. TRADOC is the Army's executive agent for accrediting Army training and education institutions and programs. The TRADOC QAO directs the program. The TRADOC QAO schedules, manages, and leads the accreditation of Army training and education institutions to ensure programs are current and relevant, are adequately supported, prepare Soldiers and leaders for the future, and conform to Army and TRs and senior leader guidance. Army accreditation is a system of self-regulation developed by QA professionals across the COEs/schools to evaluate overall institutional quality and encourage continual improvement.

(1) Accreditations conducted by civilian regional or national accreditation bodies generally provide some benefit to the COE/school or learners attending that learning institution. Proponents should weigh the benefits of civilian accreditation against the requirements to become accredited, which generally require substantial investment in personnel and resources. Army educational institutions that offer degree programs to their learners ensure their programs are consistent with the recommendations of the U.S. Department of Education and accredited by regional accrediting bodies. TP 350-70-7 provides more information on the accreditation process.

(2) Proponents should crosswalk regional, national, or specialized accreditation standards with Army requirements during all ADDIE phases. This crosswalk is generally performed during the initial analysis of requirements in the analysis phase. This crosswalk information minimizes duplication of effort and supports alignment with the accreditation standards during the initial program and course planning that occurs during the design phase.

(3) If a COE/school will be required to meet an accreditation or certification/credential-granting standard that conflicts with the guidance in this Pam, the COE/school submits an exception to policy request. The request explains the conflict and any/all mitigation measures proposed, and is submitted via memorandum to the Directorate of Learning Systems (ATZL-AUL), The Army University, U.S. Army Combined Arms Center, 101 Meade Avenue, Building 102, Leavenworth, KS 66027-1356 via official mail or electronically to ArmyU@mail.mil..

c. AR 350-1, TR 11-21, the TRADOC Supplement 1 to AR 1-201, and the TRADOC QAO website at <https://www.tradoc.army.mil/Organizations/Quality-Assurance-Office/>, provide current Army Enterprise Accreditation Standards and Army QA Program information.

Chapter 13

Managing training and education products

13-1. Managing training and education products introduction

a. The purpose of this chapter is to present management guidance for the production of institutional training domain training and education products. This chapter supports and amplifies the regulatory guidance found in TR 350-70.

b. CAC is the TRADOC core function lead for leader development, education, lessons learned, doctrine, training development, training support, and functional training. CAC manages, develops, sustains, and synchronizes learning concepts, strategies, policy, processes, systems, and requirements. CAC also recommends priorities and products to enable institutions and units to educate, train, and develop Soldiers and DA Civilians across the institutional, operational and self-development areas in support of Army readiness. (See TR 10-5 for description of core function leads).

c. ArmyU management of the Learning Enterprise. Functions include staff management of TRADOC core functions and education (governance, policy, identifying requirements, and resource common educational requirements). These functions synchronize PME across officer, warrant officer, non-commissioned officer, and Civilian cohorts to ensure vertical and horizontal integration and alignment. They additionally approve new and emerging educational requirements within PME, synchronizing the Army's credentialing efforts to align with Army requirements and Soldier-for-Life initiatives. They ensure coordination and execution of the Learning Continuum Committee of the Army Learning Coordination Council and ensure support to other Army governance forums. Lastly, ArmyU is the point of entry for operational force feedback.

13-2. Proponent guidance for product management

a. Proponent directors of training and training/education managers ensure the Learning Enterprise conducts necessary analyses. Proponents ensure that they obtain the data needed for further analysis and learning products development. In most cases, developers, SMEs, or analysts conduct the analyses or at least provide assistance. Periodic CTSSBs play a vital role in this process.

b. A proponent may only revise or develop institutional products for which they are the designated functional proponent. If another proponent requests a change to an institutional product, the responsible proponent may elect to make the change or may accept the efforts of the requesting proponent to make the change. Responsible proponents are encouraged to use the

efforts of other proponents to achieve consensual improvement of their institutional products. ArmyU provides assistance in resolving issues, as needed.

c. Proponents that develop or revise a lesson plan or TSP must provide a copy to the responsible proponent for approval. Once the plan is approved, the responsible proponent assigns an identification number prior to the lesson plan's integration into another proponent's course.

d. AR 5-22 and TR 350-70 designate proponents and responsibilities. Figure 13-1 provides a graphic display of the proponent product management process.

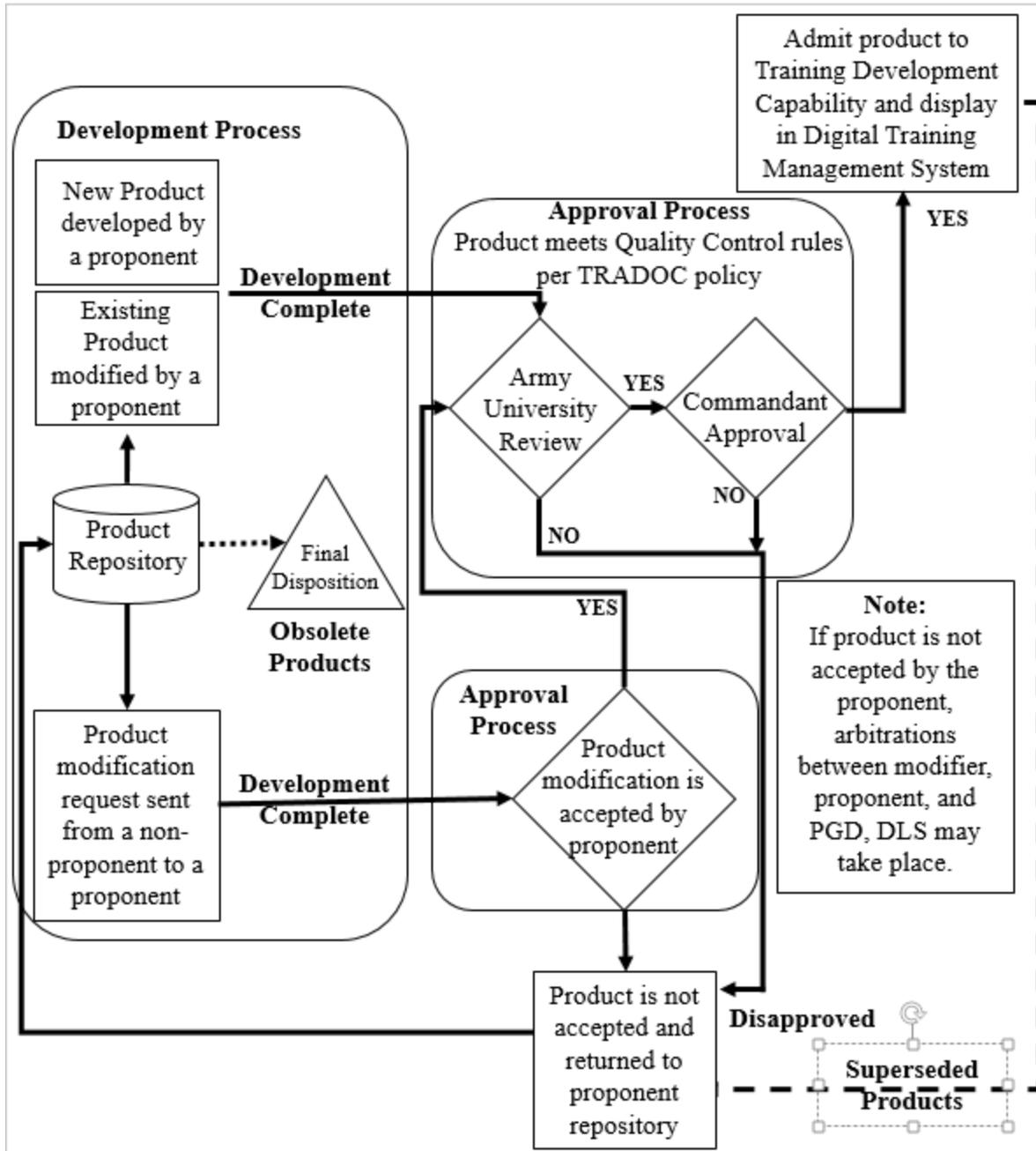


Figure 13-1. Proponent product management process

13-3. Automation of training and education products

a. Proponents must use TDC to develop and/or deliver all training and education products identified in this Pam. See table 13-1 for an overview of course numbering format and course numbering rules. Course numbers are related to DOD occupational codes described in DODI 1312.1-I and DA Pam 611-21. Course numbers will not exceed 25 characters (including spacing).

Table 13-1
Course numbering format and rules

Course numbering format	Course numbering rules
MOS Courses: 4H-441 A or 121-24C10	MOS courses: The first part of the number is a derivative of the DOD occupational code; the second part is the MOS training in the course.
Identifier and Functional Courses: 2C-F22; 244-F5	Identifier and functional courses: The first part of the number is a derivative of the DOD occupational code; the second part consists of the letter "F" plus a number assigned arbitrarily based on a running list/sequence number to identify a specific course.
Professional Military Education: 010-11C30-C45	Professional military education: The first part of the number is a derivative of the DOD occupational code; the second part indicates proponent or career management field. The third part consists of the letter "C" plus a number assigned arbitrarily to identify specific type of course.
Multiple Course Numbers: 8E-92G/8E-922A/800-F8	Multiple course numbers: Courses which train/educate more than one category of student have multiple course numbers. For example, the Food Service Management Course provides officer Advance Officer Course, warrant officer MOS, and enlisted functional training. Requests for attendance at courses with multiple course numbers should include all numbers.
Civilian Education/Leadership Courses and the Army War College Course Numbers: 1-250-C66	Civilian education/leadership courses and the U.S. Army War College Course: Course numbers will be assigned as 1-250- followed by the letter "C" plus a number assigned arbitrarily based on a running list/sequence number to identify a specific course.
Defense Language Institute Foreign Language Center: 01AD-P	Defense Language Institute: The course number will be assigned based on the type of course (01= Basic, 05=Dialect/Conversion, 06=Intermediate, 07=Advanced, and etc.) followed by the two character Language
	Identification code. If required, the second part of the course number will identify a significant change in a previously existing course or a course with a special purpose.

Table 13-1
Course numbering format and rules, cont.

<p>Defense Language Institute Foreign Language Center: 01AD-P, cont.</p>	<p>Reserve Component taught courses with the exception of Army Reserve Readiness Training Center and Professional Education Center courses that also have a TRADOC Proponent: The first part of the number is the proponent and the remainder of the course number will be assigned following the procedures outline above for that specific type of course.</p>
<p>USAR Proponent courses taught at Army Reserve Readiness Training Center: 921-9E-F70/920-F60</p>	<p>USAR Proponent courses taught at Army Reserve Readiness Training Center: The first part of the number is the proponent (921) and the remainder of the course number will be assigned following the procedures outlined above for that specific type of course.</p>
<p>ARNG Proponent courses taught at the PEC: 922-4C-F61/531-F76</p>	<p>ARNG proponent courses taught at the Professional Education Center: The first part of the number is the proponent (922) and the remainder of the course number will be assigned following the procedures outline above for that specific type of course.</p>
<p>JCABP3E53100AA (OS), Engineering Apprentice (U.S. Air Force (USAF) – this course is developed by the USAF and attended only by the USAF at a U.S. Army location.</p>	<p>Courses developed and attended by another service at a U.S. Army location use the other service course number with (OS) as the course number suffix and the name of the service attending at the end of the title in parentheses.</p>
<p>030-1372 (OS), Assault Breach Vehicle Crewman (U.S. Marine Corps (USMC)) this course is developed by the U.S. Army and attended only by USMC students.</p>	<p>Courses developed by the U.S. Army and attended only by another service use an Army-assigned course number with (OS) as the suffix and the other service designation at the end of the title.</p>
<p>A16H5A3 (SI2A), Non-Lethal Weapons Instructor – this is a course developed by the USMC, attended by multiple services at an Army location and awards SI 2A to U.S. Army officers who attend.</p>	<p>Course developed by another service (not U.S. Army) and may be attended by the U.S. Army use the other service course number, do not put (OS) at the end and do not include any service designation in the title. There is an exception. If the course awards SI/ASI/SQI, etc. to U.S. Army personnel who attend, the specialty awarded may be included in parenthesis at the end of the course number.</p>

Table 13-1
Course numbering format and rules, cont.

Course numbering format	Course numbering rules
E3OZR11A4X 000, Military Airspace Management. This type of course is usually not required to manage or load into the Army Training Requirements and Resources System.	Courses conducted at other service locations, developed by other services, and attended only by them use their number entirely.
	Courses conducted at other service locations, developed by the U.S. Army and attended by any service use the Army course number, no (OS) or service designation.
	Courses conducted at other service locations, developed by another service, and attended by U.S. Army only use other service number (if provided). If not, an Army course number will be assigned without (OS) or service designation.

b. TRADOC has established standardized course numbering suffixes for easier identification of course types. See table 13-2 for an overview of course numbering suffixes and course purposes.

Table 13-2
Course numbering suffixes and course purpose

Course numbering suffix	Course purpose
(A)	Supports deployment requirements for an overseas contingency operations.
(BQ)	Branch qualification.
(CP)	Contract taught partial.
(CT)	Contract taught 100%.
(DL)	Distributive Learning. Student does not attend resident training.
(L)	Legacy – Used to identify the old strategy for a phased course when two strategies are required in the same fiscal year. Usually only for one to two years.
(MC)	Course capable of being taught as mobile training team.
(MT)	Course taught only as mobile training team.
(N)	New equipment training taught in accordance with DA Pam 350-40.
(NS)	New strategy – Used to identify the new strategy for a phased course when two strategies are required in the same fiscal year. Usually only for one to two years then the (NS) would be removed from the course title.
(OS)	Other Service – When (OS) is used in the course number, the service will be in the course title (for example, USMC, U.S. Navy, USAF, etc.).
(P)	Proposed course – For transitional programs and if Military Occupational Change System actions have not been approved.
(PI)	Pilot course – Pilots are usually documented against currently existing courses. Pilot courses can be implemented for no more than a total of six months or three iterations (whichever is less).
(R)	MOS training for Soldiers that already hold an MOS in a different CMF.
(R1)	Obsolete – Replaced with (L) and (NS).
(RC)	Courses taught by the active component when the target audience is the reserve component only.
(RF)	100% reimbursable.
(RP)	Partial reimbursable.
(ST)	Split training.
(T)	Transition course used when training is required on new equipment for Soldiers within their current MOS or when a Soldier is changing their MOS within a CMF.
(V)	Course not SMDR programmed.
(X)	Foreign military only.

c. TRADOC has established standardized product formats and numbering/lettering rules. See table 13-3 for an overview of product formats and numbering/lettering rules.

Table 13-3
Product format and numbering/lettering rules

Product	Format	Product numbering/lettering rules
Phase	Same as course number plus phase number for example, 1, 2, 3, 4.	Single digit number. Additional phases after three must be approved by TRADOC.
Module	Each module must have a module identification, module: Letter A, B, C, etc., title, school, and type	Modules are lettered.
Course Administrative Document	Same as course number	Falls under course number.
Program of Instruction	Same as course number	Falls under course number.
Lesson plan	PPPP-NNNNNNNN	Proponent code and up to eight alphanumeric characters.
Terminal Learning Objective	There is no set numbering for TLO. The format is: Action: Conditions: Standards: Learning Domain-Level: JPME learning areas supported/GLOs:	There is only one TLO per task-based lesson plan.
Enabling Learning Objective	ELOs in a lesson plan each have a different letter; for example, ELO A, ELO B, ELO C etc. The format is: Action: Conditions: Standards: Learning domain-level: JPME learning areas supported:	An ELO has a single letter. If an ELO is used there must be at least two in the lesson plan.
Individual Task	PPPP-XXXX-NNNN	Begins with the proponent alphanumeric code, followed by the proponent-assigned code to identify the MOS, common or shared task, and ends with proponent-assigned number identifying the task within the category number.

d. TRADOC has established standardized product title examples and product title rules. See table 13-4 for an overview of product titles examples and title rules.

Table 13-4
Product title examples and product title rules

Product	Product title examples	Product title rules
Course	School determines course title. Example: Motor Transport Operator (notice the word 'course' does not follow behind the title).	Courses that produce a MOS, AOC, ASI, SI or SQI, etc. are documented consistent with DA Pam 611-21. They cannot exceed 45 characters (including spacing). From DA G-1, the word course is not to be part of the course title (there are limited exceptions). Once a CAD or POI is validated by TRADOC and uploaded in ATRRS, in order to change a course title the school must submit a request to TRADOC.
Phase	551-88M10 (R) 1.0 Motor Transport Operator Phase 1	Phase, CAD and POI titles are based on the course they support.
Course Administrative Document	551-88M10 (R) 1.0 Motor Transport Operator	
Program of Instruction	551-88M10 (R) 1.0 Motor Transport Operator	
Module	Module identification: Module – A Module: A Title: Introduction week School: Command and General Staff College, Fort Leavenworth Type: Mandatory	Module identification is identified by a letter of the alphabet beginning with A. The title reflects an overarching topic for the grouping of lessons contained within the module. The school is the school that developed the course. The type is related to the type of training.
Lesson plan	Unified command suite satellite/local television system (task-based) Leader development process (knowledge-based)	If task-based, it should be similar to the task title for ease of search capability. If knowledge, skills or attitudes-based, in a course with educational outcomes, it should be noticeably similar to the knowledge, skills or attitudes.
Terminal Learning Objective	Action: Analyze the leader development process.	It consists of an action verb, subject, and a clarifier if needed. (Lesson plan title and TLO subject will often match).
Enabling Learning Objective	Action: State the general principles of problem solving	It consists of an action verb, subject, and a clarifier if needed. An ELO defines a subset of the knowledge, skills or attitudes learners must reach to complete the TLO.
Individual task	Engage targets with an M-16 series rifle	The title must consist of one appropriate present tense action verb and one object. It may also have a qualifier.

e. Proponents enter design data, such as CAD and POI in TDC. The proponent TDC administrator controls access to the information in the database(s) and provides the appropriate read and write permissions to proponent users.

f. For those documents not in TDC, the local TED authority must have an SOP for audit trail and distribution purposes.

13-4. Quality control of training and education products

a. All new learning products will be reviewed by ArmyU for standardization and completeness in TDC. COEs/schools will ensure new institutional learning products are routed to ArmyU during the staffing process prior to routing to the approval authority per TR 350-70.

b. ArmyU will QC all revised learning products by reviewing a sample percentage with an updated change history to ensure standardization and completeness within TDC.

c. ArmyU will provide recommended changes and corrections, as necessary, to the responsible TNGDEV/manager. COEs/schools will adjudicate recommended changes and complete required corrections within TDC per TR 350-70.

d. ArmyU provides QC of proponent-developed institutional learning products to ensure the products comply with regulatory, proponenty, and sound design requirements.

13-5. Distribution of learning products

Consider the learning product complete when approved by the appropriate proponent authority (See TR 350-70 for proper proponent authority). Make the approved learning product available to the appropriate users and organizations using various distribution options. See table 13-5 for examples of learning product distribution options.

**Table 13-5
Learning product distribution options**

Option	Considerations
TDC	Distributing data electronically is the most efficient way to share proponent-approved data with the organization and unapproved data internal to the organization. Proponents control access rights.
CAR	Proponents link or load all approved and validated products to CAR. Proponents grant access to their material.
Manual distribution	Manual distribution is the most labor-intensive. Use only when necessary.
Other Options	Army LMS, Enterprise Life Long Learning Center.

13-6. Management of common core training and education

Common core training and education is the combination of common learning outcomes, common military tasks, common leader tasks, and directed or mandated tasks for specific courses, grade/skill levels, or organizational levels regardless of branch or CMF or program. Agencies involved in the management of common core training and education include the Instructional Design Division, ArmyU, the Command and General Staff College, the Warrant Officer Career College, the NCOL-COE, and the Center for Initial Military Training.

13-7. Course management

a. Course management involves identifying and managing instructional challenges. These challenges may include but are not limited to working with instructors, handling communications to and from learners, organizing and managing learner groups, maintaining attendance, recording grades, returning learner work, using media technologies, and organizing special events (for example, field trips, guest speakers). The Army's and/or institution's course management system can help store, organize, and communicate the information for a course. General course management guidance is to plan ahead, request what is needed (for example, materials, equipment, rooms) well in advance, keep detailed records, observe all federal and ARs, communicate clearly and often, and anticipate potential problems.

b. Requirements for proponent course management include following these guidelines:

(1) Review courses to ensure currency. A course is considered obsolete and in need of major revisions due to learning outcome or task performance changes that threaten survivability or mission accomplishment, that result in a major environmental or safety impact, or that can be more effectively or efficiently accomplished by changes in instructional systems or strategies.

(2) Prioritize proponent course redesign/revisions by considering the following factors:

(a) Readiness (such as MOS qualified) and mobilization requirements.

(b) Force structure changes.

(c) MOS changes/consolidations.

(d) Equipment/doctrine changes; tactics, techniques and procedures changes; and technological upgrades.

(e) Return on investment, including training load, density of proponent MOS within a TASS region, adaptability of the ARNG/USAR time constraints, training development resources, and improvement in instructional systems or strategies.

(3) Coordinate with the RC community. This is critical to ensure successful course production. Proponent schools must coordinate through their Deputy Assistant Commandant (ARNG or USAR) or total force integration officer to obtain the following assistance:

(a) SME input for job revisions, task analyses, course design and development, and courseware validation and verification.

(b) Concurrence with each proposed course structure (map), supporting narrative, and POI.

(4) Management of course analysis, design, and development to ensure timely implementation.

(5) Coordination of threat manager assistance to review and validate training products for accuracy of threat content.

13-8. Course quality assurance and workload management

Management of the evaluation and QA program involves coordination with TRADOC QAO and recording of resource requirements into DA-approved workload database(s). QAO provides proponent schools and key leaders with feedback and guidance to develop and implement quality doctrine, training, and education to ensure Army readiness. DA-approved workload database(s) are the models used to manage doctrine and Army learning product development and evaluation requirements. TNGDEVs update training and education management plans as necessary to ensure proponents are producing efficient and effective learning products. See AR 350-1 and the TRADOC QAO website for additional information.

Appendix A References

Section I

Required Publications

Official Department of the Army (DA) publications and forms are available on the Army publications website; U.S. Army Training and Doctrine Command (TRADOC) administrative publications are available on the TRADOC publications website.

Army Doctrine Publication 6-22
Army Leadership and the Profession

Army Doctrine Publication 7-0
Training

AR 25-30
The Army Publishing Program

AR 25-50
Preparing and Managing Correspondence

AR 25-55
The Department of the Army Freedom of Information Act Program

AR 25-98
Information Management Control Requirements Program

AR 25-400-2
The Army Records Information Management System

AR 27-60
Intellectual Property

AR 200-1
Environmental Protection and Enhancement

AR 350-1
Army Training and Leader Development

AR 350-38
Policies and Management for Training Aids, Devices, Simulators, and Simulations

AR 351-9
Inter-Service Training

AR 380-5
Department of the Army Information Security Program

AR 380-10
Foreign Disclosure and Contacts with Foreign Representatives

AR 525-29
Army Force Generation

ATP 3-34.5
Environmental Considerations

ATP 5-19
Risk Management

DA Pam 25-91
Visual Information Procedures

DA Pam 385-30
Risk Management

TR 10-5
U.S. Army Training and Doctrine Command

TR 10-5-4
U.S. Army Combined Arms Center

TR 11-21
TRADOC Implementation of the Army Quality Assurance Program

TR 25-36
The TRADOC Doctrine Publication Program

TR 350-18
The Army School System (TASS)

TR 350-70
Army Learning Policy and Systems

TR 385-2
U.S. Army Training and Doctrine Command Safety and Occupational Health Program

TP 350-70-5
Systems Approach to Training: Testing

TRADOC Pamphlet 350-70-14

TP 350-70-7
Army Educational Processes

TP 350-70-9
Budgeting and Resourcing

TP 350-70-12
The Army Distributed Learning Guide

TP 350-70-13
System Training Integration

TP 525-8-2
The U.S. Army Learning Concept for Training and Education 2020-2040

Section II

Related Publications

Official DA publications and forms to include ARs, ADPs, FMs, ATPs, Chairman of the Joint Chiefs of Staff Instruction (CJCSI), Joint publications, and STPs are available on the Army and the JP website; TRADOC administrative publications to include TPs are available on the TRADOC publications website.

AR 1-1
Planning, Programming, Budgeting and Execution

AR 5-22
The Army Force Modernization Proponent System

AR 600-9
The Army Body Composition Program

AR 611-series
Personnel Selection and Classification

AR 611-5
Personnel and Classification Testing

ANDERSON\KRATHWOHLIAIRASIAN\CRUIKSHANK\ MAYERIPINTRICHIRATHS\ WITTRICK, A TAXONOMY FOR LEARNING, TEACHING, AND ASSESSING; A REVISION OF BLOOM'S TAXONOMY OF EDUCATIONAL OBJECTIVES, ABRIDGED EDITION, 1st Ed., ©2001. Reprinted by permission of Pearson Education, Inc., New York, New York .

DA Pam 25-40
Army Publishing Program Procedures

DA Pam 611-21
Military Occupational Classification and Structure

DODI 1312.1-I
Occupational Conversion Index

DODI 1400.25-V410
Training, Education, and Professional Development

DODI 8910.01
Information Collection and Reporting w/ Change 1

FM 7-0
Train to Win in a Complex World

TP 350-70-1
Training Development in Support of the Operational Training Domain

TP 350-70-3
Staff and Faculty Development

Section III **Prescribed Forms**

This section contains no entries.

Section IV **Referenced Forms**

DA Form 260
Request for Publishing – DA Administrative Publications

DA Form 260-1
Request for Publishing – DA Training, Doctrinal, Technical and Equipment Publications

DA Form 2028
Recommended Changes to Publications and Blank Forms

DD Form 2977
Deliberate Risk Assessment Worksheet

Appendix B

Setting Test Standards (Passing Scores) for Tests

B-1. Purpose

This appendix provides guidance for the setting of passing scores (Go/NO-GO criteria) for knowledge-based tests. Use this guidance when using several test items to measure the objective evaluated, and the standard in the objective is not specific as to what level of mastery is required.

B-2. Standards for criterion-referenced testing

a. For a CRT, the passing (cutoff) score is set by objective, based upon the criterion standard for each objective tested within the test instrument. In other words, the item or set of items, measuring a single objective, is a separate test with its own passing score. For ease of administration, a single test instrument comprises many mini-tests that are administered concurrently within that instrument. As an analogy, each mini-test is similar to a hands-on (performance) station used for certain performance tests, with each station a mini-test, measuring a different hands-on task/skill/performance.

b. Using the test plan sample in table 11-2 as an example, it is determined that 10 questions are needed (in each version of the test) to adequately cover ELO 0001A. This set of 10 questions (and only this set) provides the information needed to make judgments about each learner's mastery of the ELO. Therefore, the standard for this ELO is based upon the learners' responses to this set of questions, and only this set of questions.

c. Applying the guidance set forth in paragraph 11-16, the cutoff score is reasonably set at 10 correct of 10 (100 percent) if the consequences of not passing the first time are reasonable (that is, the system can tolerate the time and resources needed for remediation and retesting).

B-3. Standards for norm-referenced tests

Norm-referenced tests are assessments that compare learner performance to the average learner; they do not establish whether the learner can perform a specific task or learning objective to an established standard. An example of a norm-reference test is the American College Test used for college eligibility. Army COEs/schools do not use norm-referenced tests to measure learner performance. However, COEs/schools may use norm-based aptitude tests like the ASVAB to establish parameters for predicting success within specific MOSs.

B-4. Test construction errors

As initially written, some written test items, or a set of items, may contain test/test item construction errors that lead to a learner's incorrect response when the learner is a TLO/ELO master/performer. Proper test and instructional material validation should reduce these occasions. If test construction errors are noted after administration, zero-weight the item(s) to allow attainment of the assigned cutoff level without remediation and retesting. The test proponent should give the administering activity specific, limited, discretionary zero-weighting authority in the test administration instructions or ensure the zero-weighting decision is coordinated with the test proponent after administration.

B-5. Standards for performance-based tests

Setting the overall passing score at an arbitrary percentage (for example, 70 percent) for a composite test that tests many learning objectives, is an extremely poor testing procedure. It is strongly recommended to set the standard for performance-based (written) tests at 100 percent. This philosophy is new to those previously taking or giving norm-referenced or domain-referenced tests throughout their years of schooling. These tests usually accept less than perfect knowledge/performance, because teaching to mastery cannot be accomplished or is not even desired. Army training cannot afford not to teach to mastery. When performance/knowledge must be guaranteed due to the consequences of inadequate performance/knowledge, testing to the very highest possible standard—100 percent when necessary—is absolutely critical. For example, which single critical knowledge (fact) regarding the characteristics of a particular bomb fuse would you like to not have to prove you knew if you later had to defuse a bomb? The same could be said of knowledge of the actual procedure that should be used for disarming a particular bomb before time/resources are wasted in practicing the disarming. Only set the standard at less than 100 percent in the following circumstances:

- a. The 100 percent standard is not feasible, due to the resources expended to remediate and retest to a 100 percent standard, and there is clear and convincing evidence that less than a 100 percent standard will distinguish between masters and non-masters or is adequate to certify competency.
- b. The clear lack of criticality of the specific TLO/ELO tested allows a less than 100-percent standard, and there is clear and convincing evidence (from a consensus of SMEs and test developers) that less than a 100 percent standard will distinguish between masters and non-masters or is adequate to certify competency.
- c. The test measures a supporting skill/knowledge for a performance trained later in the course, for which less than perfect knowledge/skill does not significantly detract from the effectiveness of the later training (that is, the lack of perfect knowledge of the steps in a process are overcome by later training and practicing of the entire process).
- d. Composite tests that are comprised of knowledge and performance based items can be set at a standard less than 100 percent. Training developers must ensure the test correlates to the appropriate cognitive verbs. Hands-on performance test with a performance checklist is not ideal however, a written performance based test is more suitable to capture specific learning objectives.

Appendix C**Synchronization Meetings****C-1. Synchronization meetings**

A synchronization meeting is any proponent meeting conducted with all affected stakeholders that identifies, aligns, and prioritizes critical learning requirements in support of Army readiness. Examples of synchronization meetings include CTSSB, PIC, and CDR. While COEs/schools may publish unique procedures for respective synchronization meetings, all synchronization

meetings will involve faculty and staff development (FSD) and delivery activities that support the Army mission and Army learning intent and refine and prioritize learning requirements. The CTSSB must include representatives from the operational training domain from both the RA and RC. PICs and CDRs may affect the RC; therefore, it is required to have RC representation from the institutional training domain.

C-2. Purpose

Synchronization meetings coordinate training and education solutions, publish authoritative documents covering respective functional areas of responsibility that provide the justification for learning product production, and ensure training and education support to the Army mission. The critical learning requirements, such as—individual critical tasks, are the output of a CTSSB.

TLOs are one of the outputs of a CDR synchronization meeting.

C-3. Applicability

The requirements established in this appendix apply to all TRADOC organizations responsible for conducting synchronization meetings such as CTSSBs, PICs, and CDRs.

C-4. Synchronization meetings and Analysis, Design, Development, Implementation, and Evaluation process

Figure C-1 highlights how the three major synchronization meetings fit into the ADDIE process. The CTSSB occurs during the job analysis process, to develop and approve the ICTL. The PIC provides feedback into the design phase. The PIC compiles results from program evaluation to determine accomplishment of educational outcomes. The PIC also offers an opportunity for leadership to provide guidance, which results in further analysis and change/revision prior to the CDR. To gain approval of the course purpose, educational outcomes, and TLOs, the CDR occurs during the design or redesign of a course. Also covered during the CDR is a review of course educational outcome alignment with the GLOs. For new courses with content that is not task-based but is outcome based and addresses TLOs that support educational outcomes, COEs/schools begin with a new needs analysis that is part of the analysis phase of ADDIE; proceed to a CDR, which is part of the design phase; and then continue through development, implementation, and program evaluation.

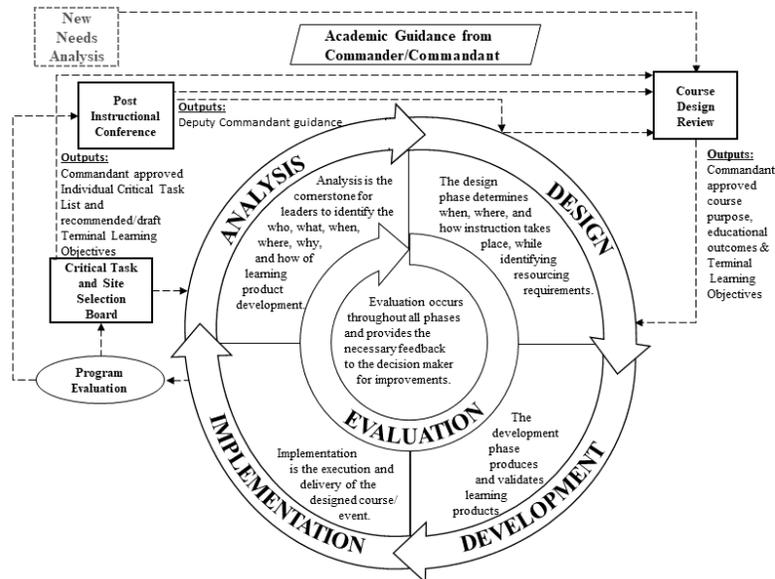


Figure C-1. Analysis, Design, Development, Implementation, and Evaluation Process with three major synchronization meetings

C-5. Critical task and site selection board

a. General. A CTSSB is a decision forum conducted either face-to-face or virtually for the selection and approval of critical tasks. The board, composed mainly of SMEs, reviews the TTI, job performance data; recommends individual tasks for approval, revision, or deletion; assigns a criticality rating to each individual task; and recommends an initial training location. The CTSSB will convene as directed by the commandant, commander, director of training, or a designated representative. Ensure that all PICs comply with the requirements addressed in AR 1-50.

b. Inputs. Inputs to the CTSSB include major changes to doctrine organization, equipment, or a job; commander/commandant's guidance; the job analysis survey data; and the TTI.

c. Board members and duties.

(1) Commander/commandant. Receives the ICTL, other documentation (TTI, list of tasks rejected by the board, minutes), and approval memorandum; approves, adds, or deletes tasks from the ICTL; and signs memorandum signifying approval of critical tasks.

(2) Chairperson/president (tiebreaker: casts tie-breaking vote only). Convenes the board; selects board members; ensures adequate RA and RC participation; presents job analysis survey results; leads discussions on critical task selection; advises the board on procedural matters; and is a SME.

(3) SMEs (voting members). Recommend changes, such as rewording, combining, adding to, or deleting tasks from the TTI. Provide technical information and advice to the board on task

content; determine criticality of each task based on the task selection model; recommend (rate) each task as critical or non-critical; and recommend where tasks should be taught in the OISD training domain for learning delivery.

(4) RC representative(s) (voting member(s)). Ensures RC requirements are included in the decision and functions as a SME.

(5) TNGDEVs (non-voting members). Coordinate/prepare site and advise board on educational, analysis, and procedural matters, such as the learning product development process, job analysis, individual task analysis definitions for an individual critical task, task performance data, task selection models, and a list of current doctrinal references in relationship to individual task and task performance data.

(6) Evaluator (non-voting member). Ensures the board bases its task criticality rating recommendation of critical/non-critical on an appropriate task selection model and ensures task title and task performance data comply with regulation requirements.

(7) Recorder (non-voting member). Records voting and discussion comments, prepares minutes of the meeting, distributes results to commandant/commander's office and QAO, prepares memorandum for commandant/commander's signature, and archives all CTSSB documentation in accordance with AR 25-400-2.

(8) Industry representative(s) (optional, non-voting member(s)). Aid in certification and credentialing efforts for Soldiers to align the job with industry. To ensure there isn't any improper influence, or the appearance of influence, have such proposed activity first be reviewed by the servicing OSJA to ensure this participation complies with law and policy.

d. Outputs. Outputs from the CTSSB include the approved ICTL and a list of individual tasks not approved by the board and their accompanying rationale. See figure D-1 for an example of an ICTL.

e. CTSSB process. Figure C-2 illustrates the steps associated with the CTSSB process.

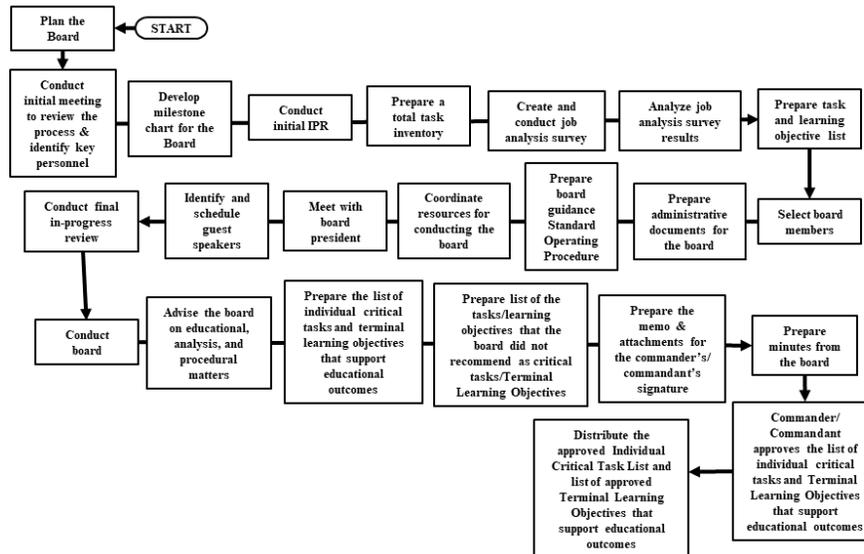


Figure C-2. Critical task and site selection board process

C-6. Post-instructional conference

a. General. The PIC is conducted to review course execution and identify trends and improvements in learning content, delivery, resources, processes, and assessments. PICs leverage results from program evaluations to determine accomplishment of educational outcomes and offer suggestions for curriculum change if needed. Ensure that all PICs comply with the requirements addressed in AR 1-50, paras 1-8 and 1-9.

b. Inputs. The PIC compiles inputs from learner performance data, instructor feedback surveys, previous PIC data, course graduate surveys (6 to 9 months post-graduation), end-of-course surveys, and first-line leader of graduate surveys.

c. Board member's duties.

(1) Deputy commandant. Attends to assure the course is relevant to the needs of the Army. Provides guidance for further analysis and change/revision prior to the CDR.

(2) Course manager/developer. Collects PIC archive data; coordinates and advertises the PIC; conducts the PIC; documents PIC activities; schedules milestones for changes; prepares PIC reports EXSUM, compiled data, non-concurrences, PIC issue staffing); distributes PIC results to commandant/commander's office and QAO; coordinate issues with appropriate command staff; monitors resolution issues and archives all PIC records in accordance with AR 25-400-2. (See TR 1-11 for EXSUM format.)

(3) Director of training or equivalent. Conducts assessment survey; analyzes results of the PIC to incorporate changes into the CAD, POIs, and other instructional materials; and integrates feedback and changes to doctrine review and refinement process.

(4) QAO representative. Analyzes collected data, posts summarized results to the proponent, and ensures archival of program evaluation documentation.

(5) FSD representative. Gathers PIC information to improve and enhance faculty development courses and determine workshop offerings, educates developers concerning the ADDIE process, and provides curriculum development assistance.

(6) RC representative. Ensures inclusion of RC requirements in the decision.

d. Outputs. The PIC is not a decision forum, it is an opportunity for leadership to provide guidance, which results in further analysis and change/revision prior to the CDR. Other outputs include an EXSUM, assessment report, and other compiled data and issues for staffing prior to the CDR.

e. PIC process. Figure C-3 depicts the steps associated with the PIC process.

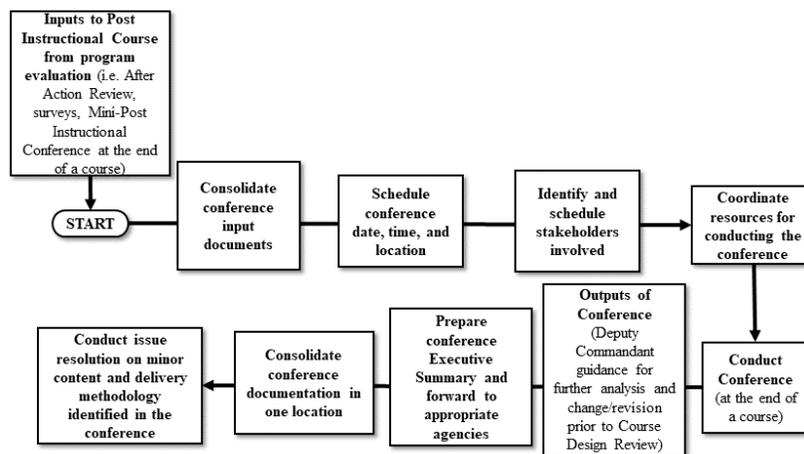


Figure C-3. Post-instructional conference process

C-7. Course design review

a. General. The CDR addresses major changes to course content, TLOs, or resource requirements and ensures the course is accurate, relevant, and effective. The CDR enables the course manager to gain approval of the course’s purpose, educational outcomes, and TLOs. Additionally, the course manager presents the course map and assessment plan. The CDR also includes the review of educational outcome alignment with the GLOs.

b. Inputs. The commander/commandant receives the recommended course purpose, educational outcomes, and TLOs for approval. Also presented are the course map and assessment plan. Other inputs to the CDR include the analysis compiled from the PIC and any major changes to resources, doctrine, and force structure.

c. Board members and duties.

(1) Commander/commandant. Approves the course purpose, educational outcomes, and TLOs.

(2) DC. Attends to assure the course is relevant to the needs of the Army.

(3) Director of training or equivalent. Ensures horizontal/vertical integration of all educational programs, ensures the educational outcomes align with the GLOs, and signs the MEP.

(4) QAO representative. Collaborates with schools to produce the MEP; evaluates achievement of educational outcomes and objectives through data collection; analyzes collected data and provides summarized results to the proponent; and ensures archival of program evaluation documentation.

(5) FSD representative. Gathers CDR information to improve and enhance faculty development courses and determine workshop offerings; educates developers concerning the ADDIE process; and provides curriculum development assistance.

(6) Course manager/developer. Develops the educational outcomes based on research of the needs of the stakeholders, reviews and crosswalks curricula to ensure programs support mission and desired educational outcomes and ensures the use of the ADDIE process in curriculum development. Coordinates and advertises the CDR, conducts rehearsal as required, presents curriculum in the CDR, captures guidance received and decisions reached during CDR, documents CDR activities, and archives all CDR documentation in accordance with AR 25-400-2.

(7) Developers. Develop educational programs that support mission, educational philosophy, and educational outcomes.

(8) RC representatives. Ensure inclusion of RC requirements in the decision.

d. Outputs. This decision forum produces the commander/commandant-approved course purpose, educational outcomes, and TLOs.

e. CDR process. (See figure C-4 which illustrates the steps associated with CDR process.)

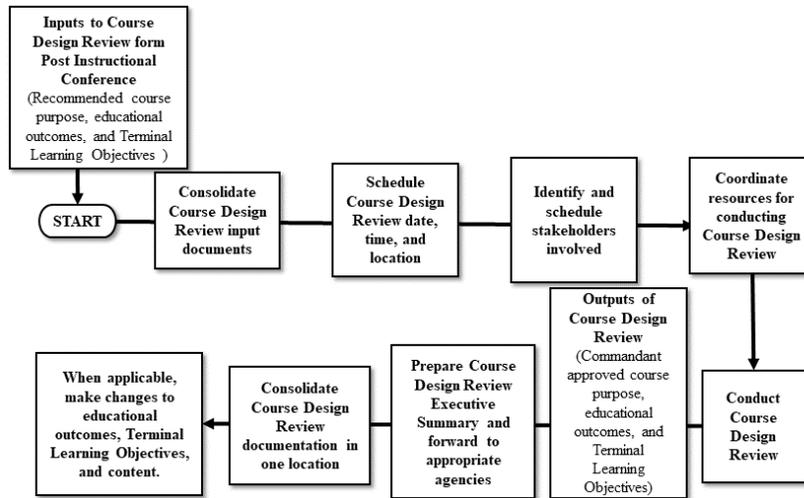


Figure C-4. Course design review process

Appendix D

Individual Critical Task List-to-Lesson Crosswalk and Terminal Learning Objective-to-Lesson Crosswalk

D-1. Individual critical task list-to-lesson crosswalk

Figure D-1 provides a sample format for cross-walking individual critical tasks from the ICTL to lessons.

Critical Task Number/Title	Lesson Number/ Title/ Version #	Taught/Reinforced/ Supported Task	List Task Steps Taught/Supported/ Reinforced	Lesson Plan in which Critical Task is Evaluated	Assessment Strategy
Module A					
071-420-0008, Conduct mounted movement by an infantry platoon.	071-FRBFD 005 Tactical maneuver training/ Version 3.00	<p>Task Taught: (Terminal Learning Objective 071-420-0008). Taught Task is identified by an asterisk on the Lesson Plan Synopsis Report). Task that the lesson either:</p> <ul style="list-style-type: none"> • Completely trains to standard, or; • Results in the completion of training of the task to standard within the course. Trains the remaining knowledge, skills, or performance steps of the task supported in previous lesson(s) within a course. <p>Task Reinforced: (071-326-5611). Task(s) (identified in a lesson plan) for which the lesson provides refresher training. Task has been completely trained in a previous lesson (s) within the course.</p> <p>Task Supported: (071-331-0820). An individual task which is partially taught in the lesson. Not all knowledge, skills or performance steps of the task are taught in the lesson. <i>Note:</i> The rest of the task is taught in another lesson or across other lesson plans.</p>	<p>Steps Taught: The steps taught in the individual task(s) listed as taught become the Learning Step Activities in the lesson plan. The task for this lesson plan has three performance steps that became the Learning Step Activities for the lesson plan. The Learning Step Activities follow:</p> <ol style="list-style-type: none"> 1. Execute traveling. 2. Execute traveling over watch. 3. Execute bounding over watch. <p>Steps Reinforced:</p> <ol style="list-style-type: none"> 1. Determine enemy location, disposition, and strength. 2. Fix the enemy. 3. Execute appropriate form of maneuver. 4. Maintain effectiveness. <p>Steps Supported:</p> <ol style="list-style-type: none"> 5. ID Obstacles. 6. ID cover and concealment. 	071-FRBFD 005/ Tactical maneuver training/ Version 3.00	
071-331-0820 Analyze the terrain.	071-3310820 Terrain Analysis/ Version 1.0	<p>Task Taught: (071-331-0820) Analyze terrain. Trains the remaining performance steps, which completes the training of the task.</p>	<p>Steps Taught:</p> <ol style="list-style-type: none"> 1. Identify effects of terrain on observation and fields of fire. 2. Identify avenues of approach. 3. Identify key & decisive terrain. 	071-3310820/ Terrain Analysis/ Version 1.0	Practical Exercise
Module B					

Figure D-1. Individual critical task list-to-lesson crosswalk sample

D-2. Terminal learning objective-to-lesson crosswalk

See figure D-2 for a sample format for cross-walking TLOs, based upon knowledge, skills or attitudes, to lessons.

TLO	TLO Action Statement	ELO	ELO Action Statement	Lesson #/Version #/Title
TLO-11	Communicate effectively	ELO-11A	Write effectively.	701-160/V1.0/Write Effectively
		ELO-11B	Construct a Military Briefing.	701-161/V1.0/Staff Communications
		ELO-11C	Engage the Media.	701-162/V1.0/Engage the Media
TLO-12	Apply the steps of the leader development process	ELO-12A	Identify attributes and competencies (ends Leader Requirements Model).	701-L020/V1.0/Leader Development Doctrine
		ELO-12B	Explain the Leader Development Model (ways/ institutional, operational, self-development, including career map.	
		ELO-12C	Plan self-development (Leader Development Improvements Guide, individual development plan (IDP), Leadermap App.	
		ELO-12D	Plan counseling.	701-L070/V1.0/Principles of Developing Others
		ELO-12E	Implement team building.	
		ELO-12F	Explain the evaluation reporting system.	
TLO-13	Analyze joint operations in the operational environment	ELO-13A	Contrast the strategic environment versus an operational environment (OE).	701-O010/V1.0/Framing the Operational Environment
		ELO-13B	Assess the operational variables (PMESII-PT).	
		ELO-13C	Determine the trends and the actors in the OE.	
		ELO-13D	Summarize the fundamentals of joint warfare.	701-O012/V1.0/Fundamentals of Joint Operations
		ELO-13E	Explain joint task force (JTF) organization and the combatant command structure	
		ELO-13F	Outline characteristics of a joint campaign.	
		ELO-13G	List national and joint systems of support for tactical-level operations.	
TLO-14	Explain mission command	ELO-14A	Explain the philosophy of mission command.	701-M012/V1.0/Fundamentals of Mission Command
		ELO-14B	Contrast the warfighting functions.	
		ELO-14C	Compare the relationships among mission command and the other warfighting functions.	
		ELO-14D	Explain the six fundamental principles of mission command.	

Figure D-2. Terminal learning objective-to-lesson crosswalk sample

Appendix E
Learning Step Activity Sequencing

E. Learning Step Activity Sequencing

Design LSAs to support each ELO and sequence them to maximize learning. Assign numbers (LSA 1, LSA 2, and others) using TDC. Figure E-1 provides an example of how to sequence LSAs to support ELOs.

Lesson Number: 123-12345678 Lesson Title: U.S. Army Doctrinal Concepts in the Operational Process Total Time: xx hrs / xx min

Experiential Learning	<i>ELO 9B</i>	<i>ELO 1A</i>	<i>ELO 10A</i>
Case Study		LSA 1 (time)	
Conducting Experiments			
Field Observations			
Field Trip/Site Visit			
Gaming			
Model Building			
Practical Exercise (Hands-On/Written)	LSA 4-7 (time)	LSA 3 (time)	
Role Playing			LSA 1 (time)
Simulation			
Story Telling			

Collaborative/Interactive Instruction	<i>ELO 9B</i>	<i>ELO 1A</i>	<i>ELO 10A</i>
Brainstorming			
Cooperative Learning Groups			LSA 4 (time)
Debates			
Discussion (Small/Large Group)	LSA 2 (time)		
Interviewing			
Laboratory Groups			
Panel			
Peer Partner Learning			
Problem Solving			LSA 3 (time)
Role Playing			
Seminar			
Tutorial			

Indirect Instruction	<i>ELO 9B</i>	<i>ELO 1A</i>	<i>ELO 10A</i>
Brainstorming			
Case Study			
Concept Mapping			
Inquiry			
Problem Solving			
Reflective Discussion		LSA 2 (time)	
Tutorial			
Writing Assignments			

Independent Study	<i>ELO 9B</i>	<i>ELO 1A</i>	<i>ELO 10A</i>
Interactive Multimedia Instruction			
Tutorial			
Writing Assignments			

Direct Instruction	<i>ELO 9B</i>	<i>ELO 1A</i>	<i>ELO 10A</i>
Compare and Contrast			
Demonstration	LSA 3 (time)		
Drill and Practice			
Guided Reading and Thinking			
Lecture	LSA 1 (time)		LSA 2 (time)
Structured Overview			
Tutorial			

Figure E-1. Sample sequencing of learning step activities to support enabling learning objectives

**Appendix F
Methods of Instruction**

F. Methods of instruction

MOI selection requires consideration of the learner, the content, the goals, the learning environment, the instructor/facilitator, and the available resources. Table F-1 identifies commonly used MOIs that support the five instructional strategies from table 7-6 and represents the preferred MOIs incorporated into TDC for TED. Although particular methods are often associated with certain strategies, some methods are also within a variety of strategies.

**Table F-1
Methods of instruction**

Method	Description	Uses
Brainstorming	A method of generating ideas to solve a problem. Brainstorming is the unrestricted sharing of ideas generated and captured in writing by an individual or by a group.	Generates uninterrupted and uninhibited ideas. Encourages learners to develop possible solutions to unpredictable situations or problems. Focuses on producing a large quantity of ideas, promotes unusual ideas, and combines and improves ideas to form better solutions that are more comprehensive.
Case study	The instructor/facilitator presents a description of a situation and the learners must solve problems or identify actions related to the situation. Situations are often an ethical dilemma, a controversial subject, or a problem to solve. At the end of the case study, the learners receive the real-world solution for comparison.	Illustrates concepts and encourages critical thinking skills. Offers a method of learning about complex situations through description and analysis. Fosters debate and discussion. Promotes higher order thinking skills. May be used as an icebreaker for a course, as a discussion board prompt, or as a test or quiz question.
Compare and contrast	Comparing two things is telling how they are alike, whereas contrasting two things is telling how they are different. A process used to practice the act of classification.	Helps learners distinguish between types of ideas or group similar ideas, engage in critical thinking, and extend beyond mere description or summary to generate analysis. Helps learners identify language cues and gain a deeper comprehension of the items for comparison. Facilitates indirect instruction through concept formation or concept attainment, often presented in either written text paragraphs or a chart. Its most common use is as a graphic organizer of content.
Concept mapping	A special form of a web-like diagram for exploring knowledge and gathering and sharing information. A concept map consists of nodes or cells that contain a concept, item or question, and links. Labeled links and arrow symbol denote direction. The labeled links explain the relationship between the nodes. The arrow describes the direction of the relationship and reads like a sentence.	Used to develop comprehension of a body of knowledge, explore new information and relationships, access prior knowledge, gather new knowledge and information, share knowledge and information generated, design structures such as web sites and multimedia presentations, and generate problem-solving options.

Table F-1
Methods of instruction, cont.

Method	Description	Uses
Conducting experiments	A procedure conducted to prove or disprove hypotheses. Experiments conducted under well-regulated conditions ensure results can be duplicated/verified. Learning occurs throughout the process and through analysis of the results.	Used to learn something new and discover an explanation of why something happens. Promotes active learning to exploit natural curiosity. Experiments introduce new ideas or clarify puzzling aspects of subjects with which learners typically struggle. Puts learners in a position to build ownership of the new idea and use it to facilitate future learning.
Cooperative learning groups	A method in which small teams, each with learners of different levels of ability, use a variety of learning activities to improve their comprehension of a subject. Each member of a team is responsible for learning and for helping teammates learn, thus creating an atmosphere of achievement. Learners work through the assignment until all group members comprehend and complete it.	Provides learners with the tools to work in a collaborative environment. Elements of cooperative learning include positive interdependence, face-to-face interaction, individual accountability, social skills, and group processing.
Debates	A structured contest of argumentation in which two opposing individuals or teams defend and attack a given proposition. Bound the procedure by rules that vary based on location and participants. Adjudicate how well the learners present and defend their positions. Following the adjudication process, a winner is declared.	Engages learners in a combination of activities that cause them to interact with the curriculum. Debate forces the participants to consider not only the facts of a situation but the implications as well. Participants think critically and strategically about both their own and their opponent's position. The competitive aspects encourage engagement and a commitment to a position. Improves communication skills.
Demonstration	A SME executes an action to a prescribed standard. Learning occurs through observation.	Helps people who learn well by modeling others. Provides opportunity for targeted questions and answers. Focuses attention on specific details.
Discussion (small or large group)	A verbal exploration of a subject, object, concept, or experience. Frequent opportunities provide learners the opportunity to generate and share their questions and ideas in small and whole class settings. Instructors/facilitators encourage and accept questions and comments without judgment of the learner. The role of the instructor/facilitator is to clarify comprehension by paraphrasing difficult terms and to focus the discussion.	Stimulates thought, explanation, reflection, and recall, and provides learners the opportunity to clarify and expand their ideas and those of others. This method also promotes positive group interaction and conversation and develops questioning techniques.

Table F-1
Methods of instruction, cont.

Method	Description	Uses
Drill and practice	This method involves repetition of specific psychomotor or cognitive skills (addition and subtraction, spelling, marksmanship). The skills, built through drill and practice, should become the building blocks for more meaningful learning. Drill and practice may be in sophisticated learning tasks that involve more than one learner.	Helps the learner master materials at his or her own pace and used as a reinforcement tool. Effective use of drill and practice depends on the recognition of the type of skill developed, and the use of appropriate techniques to develop these proficiencies. Allows for transfer of knowledge from working memory to long-term memory.
Field observations	Noticing and recording significant activities in a natural (as opposed to a classroom or laboratory) environment.	Uses a combination of observation and inquiry to collect information and see as many concrete behaviors as possible without filtering them through any interpretive process.
Field trip/site visit	Learners visit a place away from their regular environment to acquire information needed to support a specific learning objective. The instructor/guide may provide background material concerning the site.	Motivates participants and shows the relationship between provided information and the reality of the location. Provides a more hands-on and interactive experience, provides variety, and may spark new interests and passions.
Gaming	Activities where learning occurs because of competition using artificial mediums, such as simulations, that replicate actual environments and stimulate decision-making and other actions.	Learners receive immediate feedback for increased learning and determine solutions to unpredictable situations. Gaming provides for improved visualization, creative inspiration, collaboration, teamwork, advance planning, and connecting new concepts to prior experiences.
Guided reading and thinking	Instructor/facilitator questions help guide and develop the learner's comprehension of a selection. The focus is on the use of context to predict meaning.	Enables learners to establish and verbalize purposes for reading. This method develops the learners' story sense and encourages learners to use past experiences such as their knowledge of language and context clues to aid comprehension.
Interactive multimedia instruction (IMI)	IMI is a computer-based technology integrating a combination of but not limited to text, graphics, animation, sound, and video with which the learner interacts. The term IMI applies to a group of predominantly interactive, electronically delivered instruction and instructional support products.	IMI products include instructional software and software management tools used in support of instructional programs.
Inquiry	A method that provides learners opportunities to actively develop skills that enable them to locate, gather, analyze, critique, and apply information in a wide range of contexts as they develop comprehension.	Used by individuals or small groups to develop research skills. Learners identify and research a subject or question. Helps learners analyze the information, prepare reports, and present information.

Table F-1
Methods of instruction, cont.

Method	Description	Uses
Interviewing	A discussion period where the interviewer asks a series of questions of a SME on a pertinent issue. This is a personal form of research where the interviewer learns by developing questions, has the opportunity to probe or ask follow-on questions, and analyzes the responses provided.	Helps the learner develop appropriate questions without bias or preconception. Evaluation of the interview responses improves analysis skills.
Laboratory groups	A working group that uses a structured problem-solving process in a highly controlled environment to predict outcomes.	Working in groups makes instructing/facilitating more manageable as interaction occurs between the instructor/facilitator and five or six groups versus all individual learners. Learners in a group provide their thoughts, which lead to discussions. The discussion tends to bring alternate conceptions to the surface for all participants to consider.
Lecture	An oral presentation intended to present information about a particular subject within a limited period. Lectures delivered by talented speakers can be highly stimulating, and have proven to be a quick, inexpensive, and efficient way of introducing large numbers of learners to a particular subject. Voice, gestures, movements, facial expressions, and eye contact are all influential in capturing and holding the learners' interest and increasing their retention.	Lectures convey critical information, history, background, theories, and equations.
Model building	A learner designs/creates a physical or computer-generated replica of an actual item. Learning occurs through the building process.	Physical construction of a model helps the learner generate, visualize, and evaluate ideas. Model building enhances creative thinking, and helps learners become more aware of their own meta-cognitive design strategies.
Panel	Several SMEs combine to facilitate learning by providing personal observations and/or experiences on a particular subject. Sessions with panels usually include a question and answer period.	Provides a variety of views and opinions concerning material or a problem for which there is no one correct solution. Helps the audience further clarify and evaluate its positions regarding specific issues or subjects discussed and increases their comprehension of multiple points of view.
Peer partner learning	Peer partner learning is a collaborative experience in which learners learn from and with each other for individual purposes.	Learners reflect upon previously taught material by helping peers to learn and, at the same time, develop and hone their social and communication skills.
Practical exercise (hands-on/written)	An activity where learner proficiency is enhanced by practicing a new or recently learned skill or task.	Permits the learner to reinforce new learning. Contributes to physical independence or intelligence to acquire new skills.

Table F-1
Methods of instruction, cont.

Method	Description	Uses
Problem solving	Focuses on knowing the issues, considering all possible factors, and finding an acceptable solution. As all ideas are initially accepted, problem solving allows for finding the best possible solution as opposed to the easiest/first solution proposed. Separates defining what the problem looks like, from looking at the cause of the problem to prevent premature judgment. Clearly defines an acceptable solution, preventing preconceptions from driving solutions.	Helps learners think about a problem without applying their own pre-conceived ideas. Helps learners consider second and third order effects of the proposed solution(s). Learners think about a problem within a set of parameters.
Reflective discussion	The instructor/facilitator initiates a discussion by asking a question that requires learners to reflect upon and interpret films, experiences, read or recorded stories, or illustrations. The questions posed should encourage learners to relate story content to life experiences and to other stories.	Allows the learner to gain knowledge through their experiences, analysis, imagination, affect, and impression (reflection). Reflective discussions encourage learners to think and talk about what they have observed, heard, or read.
Role playing	Learners act out a simulated situation, position, or job. For example, a learner may assume the duties of a staff member and perform the work of that position.	Develops empathy and new insights. Stimulates discussion and communication. Provides a means to assess decision making in a specific role. Allows for a variety of situations and parameters that garner attention, participation, and motivation. Promotes comprehension of other people's positions and their attitudes as well as the procedures used for diagnosing and solving problems.
Seminar	A facilitated small-group discussion usually preceded by a presentation on a pertinent issue by a SME.	Seminars place the focus on the input of all the seminar participants to familiarize participants more extensively with the methodology of their chosen field, allow participants to interact with practical problems that could commonly occur, and provide a broader perspective of a particular issue.
Simulation	Any representation or imitation of reality simulating part of a system, the operation of a system, and the environment in which a system will operate are the three common types of simulation. There are virtual and constructive simulations.	Replaces/complements live training. Provides the means to practice an action or activity safely under any condition. Used for individual training and education (such as repairing equipment or gunnery) or unit training (such as fighting a tank or tank company). May be used on a single computer or station, distributed over a local area network, or used on a wide area network to multiple simultaneous users.

Table F-1
Methods of instruction, cont.

Method	Description	Uses
Storytelling	A SME uses vignettes (real or made up) to convey information or ideas, or to stimulate thought or discussion.	Provides a means of sharing and interpreting experiences. Storytelling is another way of teaching ethics, values, and cultural norms and differences. Stories provide a tool to transfer knowledge in a social context. They increase verbal proficiency and encourage the use of imagination and creativity.
Structured overview	Verbal, visual, or written summary or outline of a subject. It can occur at the beginning of a unit, module, or new concept, or be used to help relate a learned idea to the big picture. A structured overview distills a difficult or complex idea into simple definitions or explanations, and then shows how all the information relates. It is the process of organizing and arranging subjects to make them more meaningful.	Helps learners place new ideas in context. Because ideas are simplified, it is easier for learners to see the big picture. Connecting new ideas to information learners already comprehend makes it easier to retain.
Tutorial	A SME provides assistance to one or a small group of learners, usually to enhance previously taught lessons. Tutorials involve a high degree of learner-instructor interaction.	Develops or enhances skills, develops effective study habits, increases self-confidence, and increases the learners' comprehension of the subject matter.
Writing assignments	Writing assignments can have a broad range of styles. A writing assignment succeeds by addressing a defined audience with content organized into an effective and/or convincing presentation. For example, the learning log has a different purpose, components, and style than an essay; a report has a different purpose, components, and style than a white paper. Forms of writing may include essays, journals, learning logs, reports, and narratives.	Improves writing skills and requires critical thinking about the subject, purpose, and the audience. Organizes thoughts and allows for communicating effectively, conceptualizing ideas, convincing others, increasing meta-cognition, and identifying critical information.

Appendix G

The Army University Experiential Learning Model: A Five-Step Process

G. The Army University Experiential Learning Model

See figure G-1 for information concerning the five-step process for the ArmyU ELM.

a. COEs and schools should consider using experiential learning as their instructional strategy. Experiential learning is an inductive, learner-centered, activity-oriented, personalized reflection about a learning experience. Formulations of plans to apply learning to other contexts are critical factors in this strategy. Experiential learning generally follows a cycle consisting of five necessary steps. These steps are concrete experience (CE) (a trigger of experience and

knowledge), publish and process (P&P) (reactions and observations are shared), GNI (focuses on content and methodology), develop (learner-centric focus on how the lesson will be valuable to the learner), and apply (a final check on learning; determination of achievement of learning objectives).

b. The emphasis in experiential learning is on the process of learning and not on the product. Experiential learning helps to develop inductive reasoning, analysis, personal reflection, ability to formulate plans, speaking and writing, and lifelong learning attitudes. (See figure G-1 for the ArmyU/ELM overview.)

(1) Concrete experience.

(a) The CE serves as a trigger of experience and knowledge, a focusing mechanism for the lesson that follows, and a support for the teaching of new content. The CE's role as a trigger is essential as it forces the learner to connect the subject at hand with his or her understanding of it. This understanding is the result of experience, previous knowledge, and reflection on the intersection of experience and previous knowledge.

(b) The CE brings the subject into focus for an entire group. More importantly, the CE is the first opportunity to appeal to the learner's affective domain behavior of valuing. This is essential to internalize or learn lesson content.

(c) The CE supports the teaching of the new content by providing a common experience connected to the new content of GNI. If a lesson is on decision-making, then use CE to illuminate proper decision-making.

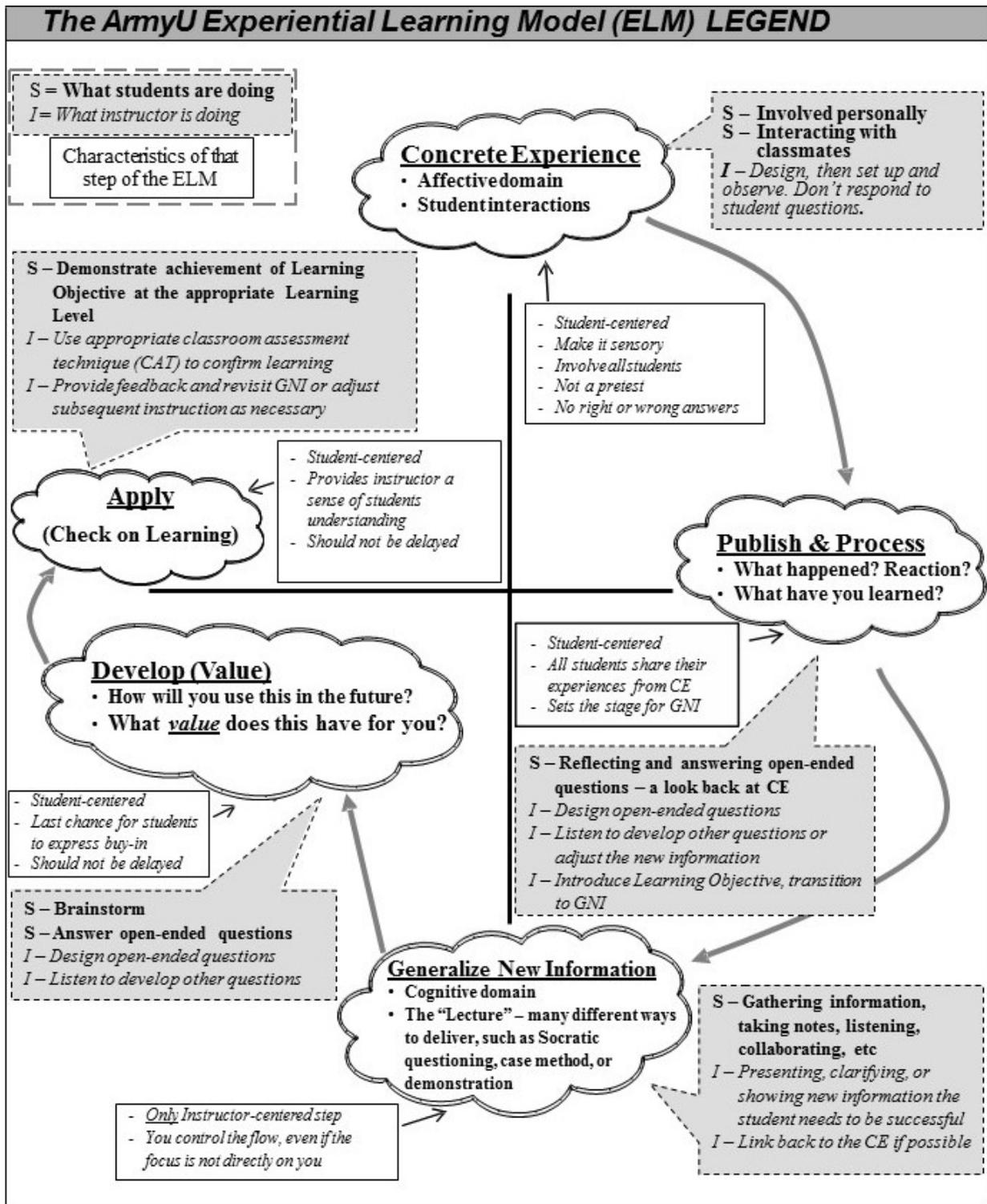


Figure G-1. The Army University Experiential Learning Model

(d) The CE that is capable of all this can be a single word, such as torture, a short vignette, or short video clip. For the instructor/facilitator, the CE marks not only the beginning of the lesson, but also the start of the marketing campaign to sell the new content to the learner. If done

properly, this effort can create a situation where the learner pulls the content from the instructor/facilitator instead of the instructor/facilitator having to push the content to the learner.

(2) P&P.

(a) Publish as the first component of the P&P solicits learners' observations about what they observed in the CE, typically with a question like, "What did you see?" or "What happened?" Process as the second component asks learners to process their reactions to what they saw and how their views compared with those of their classmates. A simple question to initiate this affective processing is, "What's your reaction?" In this P&P, learners take the first step in their learning by connecting their experience and knowledge to the subject at hand.

(b) The desired, normally occurring situation is a publish step that produces a wide variety of learner observations. This is the foundation for the process component of the P&P. The process may be the most important aspect of the entire ELM process. It is here that the learner begins a reconciliation of where he or she is and where he or she will be at lesson end, if successful.

(c) This reconciliation has the potential to reveal learner bias and other preconceptions that need to be addressed and understood if learning is to occur. It is during this step that evidence of learners' critical thinking skills should begin to emerge as they consider alternative points of view and examine their own assumptions and biases.

(3) GNI.

(a) After the learners have published and processed, the instructor must assess where the learners are and compare to where they must be at the end of the lesson to achieve the enabling learning objective—in other words, the delta between what they know and what they should know. Additionally, the P&P may illuminate points that the instructor can make during GNI that will connect back to the CE and reinforce a sense of value in the lesson material. This sense of value should be initiated during the CE and P&P, reinforced during the GNI, and ultimately expressed by the learners during the develop step of the ELM. Mastery of the content taught during the GNI is verified during the apply step.

(b) Often, GNI is thought of as the lecture portion of the ELM. However, the specific method of instruction used can include lecture, discussion, role-play, simulation, or any of several other delivery approaches. A common misconception voiced by those new to the ELM is that discussion is the principal content delivery method. The key is to use a technique that is appropriate to the content, learning domain and level, learner prior knowledge and expertise, and time available.

(4) Develop.

(a) The develop step seems to be the most confusing step for TNGDEVs and is probably so for learners as well. In the ELM, a better word than develop might be value. Albeit a bit late, this step of the ELM serves to ensure the learner sees the relevance of the GNI just presented.

This is not the place to establish value; instead, this is the opportunity for learners to express their appreciation of the value initiated during the CE and reinforced throughout the P&P and GNI.

(b) Evidence of the learners' value for the knowledge should have been observed in learner comments and participation throughout the first three steps of the ELM. For example, during GNI a learner might say something similar to, "This is really going to be helpful to me in my next job as a planner," or "I can even use this process to negotiate a better deal on a new car." These are examples of unsolicited comments that complete the develop step, perhaps even before the learners reach that step of the ELM.

(c) The develop step offers another opportunity for the instructor to observe the learners' critical thinking skills as they formulate their expressions of the purpose of the learning and why it is significant to them.

(5) Apply.

(a) The final step of the ELM is the apply step. Although the apply step may resemble an assessment or a test, it is neither. It acts as a feedback tool for the instructor. It is the final check on learning to confirm the instructor adequately and successfully taught the lesson—a measure of the instructor's effectiveness. This is a check on learning to ensure the learners understand the material. If there are still unanswered questions or confusion, the instructor can return to the GNI to fill in the holes before dismissing the learners, or at least can identify reinforced points in a subsequent lesson to ensure the learners possess the knowledge, skills and attitudes that they need. In contrast, an assessment or test is a measure of the learners' mastery of skills or knowledge that they will need. A delayed assessment may provide learners time to complete a written assignment, a group exercise, or any number of other appropriate assessment instruments. But the apply step should not be delayed since it enables the instructor to confirm that he or she has been successful in helping the learners reach the ELO at the prescribed learning level and as defined by the standards of the ELO. This may be accomplished using formal or informal classroom assessment techniques.

(b) The apply step is also often confused by instructors as well as lesson authors. Due to the similarity of apply with test or assessment, the term "delayed apply" has come into common use. These terms have distinct meanings and instructors or lesson authors explain them in separate paragraphs of the lesson plan. As the final step of the ELM, apply is in paragraph 6 of the lesson plan. The assessment or test is in paragraph 7 and in appendix A of the lesson plan, delineating the specific graded requirements, instruments, and weights for the lesson or block of instruction. In apply, the instructor has the latitude as to how to determine whether he or she has successfully taught the lesson; in the assessment, the instructor may not deviate from the requirements set out in the assessment plan.

(c) As in the develop step, learners may reach into the apply step before the previous steps have been fully completed. For example, during a discussion-based GNI, it is likely that learners will demonstrate their understanding or lack thereof, regarding the lesson content. Depending on

the learners' engagement in the discussion, it may not be necessary to conduct a detailed apply at the end of the lesson; instructors should neither omit nor delay this step.

Appendix H
Course Management Plan

H. Course management plan

See figure H-1 for information concerning the CMP.

a. The CMP tells the course manager and instructors/facilitators how to manage/conduct the course. The CMP supports structure, sequence, and course design requirements.

b. Figure H-1 provides an example of what constitutes a course management plan.

Course Management Plan	
For the course [course number, name], [date]	
TABLE OF CONTENTS	
	PAGE
* Course Structure	CMP-1
* Course Map (Mandatory Training Sequence)	CMP-2
* Training Sequence	CMP-3
Course Manager Qualifications	CMP-4
Course Manager Guidance	CMP-5
* Instructor Certification Requirements	CMP-5
Instructor/Facilitator Guidance	CMP-6
Student Guidance	CMP-7
* Assessment Administration Guidance	CMP-8
Required References	CMP-9
Trainer Guidance	CMP-10
<i>Note: Mandatory components are marked with an asterisk. Record any differences between RA and USAR/ARNG instructor/facilitator and/or student implementation guidance.</i>	
COURSE STRUCTURE	
This course is structured in phases, modules, and lessons. [Include graphic display of course structure and supporting narrative.]	
(1) Graphic display:	
(2) Narrative description:	

Figure H-1. Course management plan format

<p>COURSE MAP</p> <p>This course shows the mandatory training sequence for this course. Each lesson that is shown as a prerequisite for another lesson must be taught before that follow-on lesson is presented. This mandatory training sequence cannot be violated. Failure to follow it means students will receive training for which they have not received the prerequisite training.</p> <p>[Place lesson course map here. There may be a course map for phase sequencing and module sequencing in addition to the required lesson course map.]</p>
<p>TRAINING SCHEDULES</p> <p>[Provide some possible training schedules based on the course map mandatory training sequence.]</p>
<p>COURSE MANAGER QUALIFICATIONS</p> <p>Course managers will have the following qualifications:</p>
<p>COURSE MANAGER GUIDANCE</p> <p>The course manager is responsible for ensuring the training is presented as designed. Specifically, course manager(s) will:</p> <ol style="list-style-type: none"> (1) Ensure required training resources are available for presenting the training as scheduled (or are available when required by the student taking DL). (2) Ensure instructors/facilitators receive support, materials, and equipment required for presenting this training. (3) Ensure staff and faculty are trained to present and manage this training. (4) Continuously evaluate course effectiveness and efficiency and provide appropriate feedback to the training and education proponent. (5) Ensure staff, faculty, and students comply with all safety, risk management, environmental protection rules, regulations, laws, guidance, and course requirements. (6) Ensure facilities, material, equipment, and systems required for presenting this instruction are properly maintained. (7) Obtain required reference materials. (8) Include DL management guidance as required. Add other guidance as needed. Provide all the information necessary for managing and implementing the course, including resource and graduation requirements

Figure H-1. Course management plan format, cont.

<p>INSTRUCTOR CERTIFICATION REQUIREMENTS</p> <p>Instructors presenting this training will meet the following certification requirements:</p> <ol style="list-style-type: none">(1)(2) <p>Special instructor qualifications are: [If applicable.]</p>
<p>INSTRUCTOR/FACILITATOR GUIDANCE</p> <p>Instructors/facilitators are directly in contact with the students and represent the command in the presentation of instruction. They serve as the role model for the students. They will be technically competent and professional in demeanor.</p> <p>Each instructor/facilitator will:</p> <ol style="list-style-type: none">(1) Thoroughly study and be well-versed in the material prior to presenting the lessons.(2) Manage the instruction and maintain an environment conducive to student learning.(3) Supervise and guide the learning process.(4) Provide immediate feedback on student performance.(5) Be alert to students having difficulty and intercede as appropriate.(6) Hand out the student guide (if applicable) and student assessment plan (SAP) to the students before instruction begins.(7) Ensure students comply with safety and environmental protection rules, regulations, laws, and course requirements.(8) Explain the graduation criteria and requirements to the students prior to start of course.

Figure H-1. Course management plan format, cont.

<p>(9) Maintain the following records: [List those appropriate for this course.]</p> <p>(10) Counsel students.</p> <p>(11) Provide appropriate remediation.</p> <p>(12) Continuously evaluate course effectiveness and efficiency and provide appropriate feedback to the training and education proponent.</p> <p>(13) Ensure the network is up and functional for video tele-training, as appropriate.</p>
<p>STUDENT GUIDANCE</p> <p>It is the responsibility of the student to learn to perform the lesson's learning objective(s) of this training. This includes completing the home assignments, completing practical exercises, and participating in training activities.</p> <p>(1) The student is to be provided the student guide (if applicable) and ISAP before instruction begins. The use/importance of these items and student responsibilities will be thoroughly explained to the students.</p> <p>(2) Students need to provide constructive criticism concerning the efficiency and effectiveness of the training and training materials.</p>
<p>ASSESSMENT ADMINISTRATION GUIDANCE</p> <p>Administer the assessment(s) in accordance with the guidance in the enclosed training material. Special guidance and instructions (if any) follow:</p>

Figure H-1. Course management plan format, cont.

REQUIRED REFERENCES				
[List, as required, all references required to teach this course.]				
(1) Military references				
Publication Number	Title	Publication Date		
<i>Note:</i> Verify whether military references are up-to-date via the Internet:				
http://www.apd.army.mil/				
(2) Civilian references				
Title	Author	Date	Publisher	ISBN #
TRAINER GUIDANCE				
[Provide detailed guidance for training in the unit if part of this course is conducted in a unit.]				

Figure H-1. Course management plan format, cont.

Glossary

Section I

Abbreviations and Acronyms

AAR	after-action review
ADDIE	Analysis, Design, Development, Implementation, and Evaluation
ADP	Army doctrine publication
ALCMC	Army Learning Content and Management Capability
ALM	Army Learning Model
AOC	area of concentration
AFT	Army Fitness Test
AR	Army Regulation
ARI	U.S. Army Research Institute
ARNG	Army National Guard
ASI	additional skill identifier
ASVAB	Armed Services Vocational Aptitude Battery
ATN	Army Training Network
ATP	Army Techniques Publication
ATRRS	Army Training Requirements and Resources System

ATSC	Army Training Support Center
AUTL	Army Universal Task List
CAC	U.S. Army Combined Arms Center
CAC-T	U.S. Army Combined Arms Center – Training
CAD	course administrative data
CALL	Center for Army Lessons Learned
CAR	Central Army Registry
CD	compact disc
CDF	criticality-difficulty-frequency
CDR	course design review
CE	concrete experience
CES	civilian education system
CMF	career management field
CMP	course management plan
COE	centers of excellence
CRT	criterion-referenced test
CTC	combat training center
CTSSB	critical task and site selection board
DA	Department of the Army
DCS	Deputy Chief of Staff
DIF	difficulty-importance-frequency
DL	distributed learning
DOD	Department of Defense
DODI	Department of Defense Instruction
DOTMLPF-P	doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy
DVD	digital video disc
ELM	Experiential Learning Model
ELO	enabling learning objective
EPSS	electronic performance support system
EXSUM	executive summary
FD	foreign disclosure
FM	field manual
FSD	faculty and staff development
FY	fiscal year
GLO	general learning outcome
GNI	generalizing new information
GTA	graphic training aid
HQ	headquarters
HQDA	Headquarters, Department of the Army
IA	instructor action
ICH	instructor contact hour
ICTL	individual critical task list
ILP	individual learning plan
IMCO	information management control officer
IMI	interactive multimedia instruction

IMT	initial military training
IP	instructor pilot
IRM	instructor requirements model
ISAP	individual student assessment plan
ISR	instructor-to-student ratio
ITMMT	Institutional Training Mission Management Tool
ITP	individual training plan
ITRO	Inter-Service Training Review Organization
JA	job aid
JPME	Joint Professional Military Education
LIC	language identifier code
LMS	learning management system
LSA	learning step activity
MCCOE	Mission Command Center of Excellence
MDMP	military decision-making process
MEL	military education level
MEP	master evaluation plan
MET	mission essential task
METL	mission essential task list
MOI	method of instruction
MOS	military occupational specialty
NCOLCOE	The Noncommissioned Officer Leadership Center of Excellence
OISD	operational, institutional, and self-development
OPFOR	opposing force
OPTEMPO	operational tempo
OSUT	one station unit training
P&P	publish and process
Pam	pamphlet
PIC	post-instructional conference
PMCS	preventive maintenance checks and services
PME	professional military education
POC	point of contact
POI	program of instruction
PRT	physical readiness training
QA	quality assurance
QAE	quality assurance element
QAO	quality assurance office
QC	quality control
RA	Regular Army
RC	Reserve Component
SGM	sergeant major
SI	skill identifier
SME	subject matter expert
SOP	standard operating procedure
SQI	special qualification identifier
SSG	staff sergeant

STP	Soldier training publication
TADSS	training aids, devices, simulators, and simulations
TASS	The Army School System
TC	training circular
TDC	training development capability
TDY	temporary duty
TED	training and education development
TED-T	Training and Education Developer Toolbox
TLO	terminal learning objective
TNGDEV	training and education developer
TOMA	Training Operations Management Activity
TP	U.S. Army Training and Doctrine Command pamphlet
TR	U.S. Army Training and Doctrine Command regulation
TRADOC	U.S. Army Training and Doctrine Command
TRAS	training requirements analysis system
TSP	training support package
TTI	total task inventory
UJTL	Universal Joint Task List
USAR	U.S. Army Reserve
USASMA	U.S. Army Sergeants Major Academy
UTL	unit task list

Section II

Terms

Academic hours

Time that an instructor or multiple instructors are present with students during a formal lesson and are presenting curriculum and/or executing a training event. Academic hours capture the instructor's work hours when they are with the students formally executing the POI lessons and are the basis for ICHs. Academic hours are used to determine the course length.

Academic time

Academic time is the total time in a course a student spends towards achieving the learning objectives of the course during the academic day.

Accreditation

A disciplined approach to ensuring standardization across the Army in ensuring that training institutions meet accepted standards, and are in accordance with higher HQ guidance. It is the result of an evaluative process that certifies an institution meets the required percentage of TRADOC Accreditation standards with a focus on quality currency and relevant training and education that meets the needs of the Army. (AR 350-1) It is also the voluntary process of evaluating institutions or programs to guarantee acceptable levels of quality, including recognition by the U.S. Secretary of Education (See DODI 1400.25-V410 Training, Education, and Professional Development).

Action

A verb that conveys action or behaviors and reflects the type of leader competency or performance that is to occur (examples: analyze, defend, place, cut, drive, open, and hold). Action verbs reflect behaviors that are measurable, observable, verifiable, and reliable.

Active learning

An approach to instruction in which learners engage the material they study through reading, writing, talking, listening, and reflecting. Active learning focuses the responsibility of learning on the learners.

Administrative time

Administrative time is the total time in a course a student spends performing activities unrelated to the learning objective of the course during the duty day.

Analysis

A phase of the ADDIE process that involves the detailed break down and examination of jobs, functions, tasks, objectives, and performance measures to determine requirements and how those requirements relate to one another. Analysis provides the foundation that justifies the continuation or termination of the ADDIE process. (TR 350-70)

Analysis, Design, Development, Implementation, and Evaluation

The Army's instructional design framework TNGDEVs use to build learning products. The process involves five interrelated phases: analysis, design, development, implementation, and evaluation. It determines whether training and education is needed; what is instructed; who receives the instruction; how, how well, and where the instruction is presented; and the support and resources required to produce, distribute, implement, and evaluate those learning products. (TR 350-70)

Analyst

An individual assigned to perform the analysis associated with the ADDIE process. Personnel assigned to this position (or who are detailed to assist in analysis) are trained in their area of responsibility and have a knowledge of command/unit mission and structure, analysis techniques, documentation research, and interview techniques. An analyst need not be a SME but should have access to job experts.

Army Learning Enterprise

The Army Learning Enterprise is a framework for learning and leader development supported by leadership and management of policies, standards, networks, data repositories, and delivery platforms.

Army Learning Model

ALM describes the framework, required capabilities, and on-going actions to implement a learner-centric, technology enabled, and career-long institutional learning model.

Assessment

The measurement of an individual's learning. Assessment of a learner is accomplished often through a test of whether or not skills, knowledge, and/or performance have been attained.

Asynchronous learning environment

An asynchronous learning environment exists when communication between the instructor/facilitator and the learner(s) is not simultaneous. (AR 351-9)

Attitude

Attitude is a way of thinking about a person, place, thing, or event and the behavior displayed that reflects the Soldier's and DA Civilian's way of thinking and defined largely through affective learning. In a learning setting, an attitude is a quality, property or characteristic of an individual that moderates how well learning and performance occur.

Attribute

A quality, property, or characteristic of an individual that moderates how well learning and performance occur.

Behavior

Specifies what a learner must do to satisfy a job performance requirement. Behavior may involve recall, manipulation, discrimination, problem solving, performing a step-by-step procedure, or producing a product.

Behavioral statement

Statement of the behavior the learner must exhibit. If required, a condition or standard clarify the behavior, and either or both needs included.

Best practice

A method or technique that has consistently shown results superior to those achieved with other means and used as a benchmark. A best practice used to describe the process of developing and following a standard way of doing things that multiple organizations can use.

Blended learning

Combines face-to-face classroom approaches with technology-delivered instruction delivered either in a resident or nonresident/DL environment to form an integrated instructional approach.

Block of instruction

One or more related units or modules grouped to cover course major subject or task areas.

Certification

Individual Soldiers and Civilians: Certifications are formal procedures or official designations that attest in writing, to a Soldier or Army Civilian's possession of certain attributes, characteristics, quality, qualification, or status in accordance with established requirements or standards. Confirmation of a certification is often provided by some form of external review, education, assessment, exam, or audit. It is also the recognition or credential given to individuals

who have met predetermined qualifications set by an agency of government, industry, or a profession (See DODI 1400.25–V410).

Check on learning

A type of formative assessment of a learning objective. Examples may be a short ungraded quiz, an ungraded practical exercise, and check on learning questions. It can be written, verbal, or performed in a small group.

Classified military information

Information originated by or for the DOD or its agencies or is under their jurisdiction or control and that requires protection in the interests of national security. It is designated TOP SECRET, SECRET, and CONFIDENTIAL.

Collective task analysis

Collective task analysis is a direct result of a mission analysis and an approved UTL. Conduct collective task analysis when the mission analysis process identifies gaps in unit training. The mission analysis team provides results in terms of doctrinal deficiencies in the proponent missions and/or tasks in order to conduct collective task analysis.

U.S. Army Combined Arms Center

The proponent for Army TED and critical operational lessons learned. CAC supports and integrates Army training and education across all cohorts in support of force generation (Sustainable Readiness Process).

Condition

Condition specifies the limits for performance of a behavior. Conditions may include the use of specific equipment to demonstrate a behavior during the performance of a task. Conditions may also be information provided to guide action a specific way.

Content validation

A type of formative evaluation and the process used to verify that the information in the lesson/course is technically accurate and integrates current and emerging doctrine. Optimally, conduct content validations immediately after the components in each LSA are developed; therefore, perform content validations incrementally.

Controlled unclassified information

Unclassified information, to which access or distribution limitations are applied pursuant to national laws, policies, and regulations of the originating country.

Course

A complete series of instructional units (phases, modules, and lessons) identified by common title and number consisting of curriculum inclusive of critical tasks or educational requirements. A course qualifies a jobholder for a specific job or function MOS/AOC skill level, SQI,ASI, language identifier code (LIC), SI within the Total Army), or provides information on specific professional development or Army leadership subjects.

Course administrative data

A TRAS document that is the proponent's initial estimate or projection of a course's administrative data and resource requirements; serves as a change document for submission of administrative and resource changes to a specific course or course phase; stimulates changes to the Army's institutional training management systems; and stimulates resource systems and processes needed to acquire the resource before the course implementation date.

Course content

The applicable training standard to teach contains identified knowledge, skills and attitudes, including proficiency levels. Adding or deleting tasks or TLOs or changing proficiency levels constitutes a course content change. Rearranging objectives, reallocating times within a course, and inserting technology or updated equipment used to teach course content, address how the course content is taught but do not change actual course content.

Course implementation

Course implementation begins when the first validation class starts.

Course manager

The proponent course manager is the individual with overall responsibility for the designing, developing, resourcing, executing, and evaluating a course of instruction. The course manager is responsible for ensuring staff and faculty is qualified to present the course material.

Course map

The course map is the compilation of the course structure, based on the course content outline previously developed, with the addition of the lessons (sequenced as necessary or appropriate).

Course outcome

Clearly defined, broad statements that specify learning competencies that learners will know, do, or demonstrate when they have completed the instruction. Course outcomes address the knowledge domains a course uses, and align with the course scope, learning objectives, learning assessments, instructional activities and learning strategies. Outcomes list the subjects in performance and/or action statements that are broken down and translated into learning objectives. TNGDEVs translate course outcomes into valid learning objectives that assess learners' achievement of learning standards. The outcomes should be measurable.

Course purpose statement

A course purpose statement is a description of how the learning content contributes to Army readiness.

Course scope statement

A course scope statement is a description of the extent to which the subject matter is taught and assessed.

Criterion

The standard used to measure something. In Army learning, the measure of learner performance is the task or learning objective standard. In assessment validation, correlate assessment instruments against the standard to indicate the accuracy with which they predict human

performance in some specific area. In evaluation, it is the measure used to determine the adequacy of a product, process, or behavior.

Critical learning requirements

Individual critical tasks and TLOs derived from analysis of the Army Profession, Army Mission, and specific job or function requirements. These results of various analyses determine the overall job and professional requirements needed to inform Army learning product design and development.

Critical task and site selection board

A CTSSB is a management device that serves a QC function in the selection of critical tasks. The board, composed mainly of SMEs, reviews the TTI and job performance data; recommends tasks for approval, revision, or deletion; assigns a criticality rating to each task; and recommends an initial training location.

Curriculum

A course (or set of courses) and their content offered by a school. Curriculum is prescriptive and specifies what subjects must be understood and to what level to achieve a particular grade or standard.

Design

A phase in the ADDIE process where managers and TNGDEVs translate analysis data into an outline for learning, create a blueprint for learning product development, and determine how to and the sequence of training. Outputs from the design phase then serve as the framework for the development phase of the ADDIE process.

Developer

The individual whose function is to analyze, design, develop, and evaluate learning products, to include development of training strategies, plans, and products to support resident, nonresident/DL, and unit training. Any individual functioning in this capacity is a developer regardless of job or position title.

Development

A phase in the ADDIE process used to convert the design into resident and nonresident/DL learning products and components, such as lesson plans, student handouts, and media.

Distributed learning

DL is the delivery of standardized individual, collective, and self-development training to units, Soldiers, leaders, and DA Civilians at the right place and right time, using multiple means and technologies, with synchronous and blended learner-instructor interaction. Synchronous interaction occurs when learners have immediate communication with their instructor (for example, video tele-training, Internet chat rooms, or virtual environments). Asynchronous interaction occurs when learners have delayed communication with their instructor (for example, e-mail, recorded video, online asynchronous discussions, and submission of studies and papers) or when learners are engaged in self-paced instruction without benefit of access to an instructor (for example, CD-based courseware, web-based courseware, or correspondence courses).

Blended learning is a mix of synchronous and asynchronous media methodologies that best meets the instructional goal. It combines face-to-face classroom methods with technology-delivered instruction delivered in a resident or nonresident/DL environment to form an integrated instructional approach.

Doctrine analysis

Doctrine analysis aligns collective tasks with AUTL tasks and UJTL tasks and identifies the METs needed for units to be able to perform their missions. A formal review process approves the METs and determines a unit's METL. Develop Combat Army Training Strategy using the unit's METL, Table of Organization and Equipment, UTL, and other key documents.

Educational outcome

Educational outcomes are the knowledge, skills and attitudes required for performance and attained as the end state educational experience in a course. Educational outcomes are observable and measurable and indicate the level and depth of learning individuals are required to know or to be able to do.

Enabling learning objective

ELO defines a subset of the skills and knowledge learners attain to complete the TLO. ELOs facilitate the TLO being broken down into smaller, more manageable objectives. An ELO supports the TLO and measures an element of the TLO, and addresses the knowledge, skill and attitudes gaps. Identify ELOs when designing the lesson plan. At least one of the ELOs supporting the TLO must be at the same learning level of the TLO. ELOs are optional based on analysis of the TLO and when used, there must be a minimum of two.

Evaluation

This is a phase in the ADDIE process. Evaluation is the QC mechanism for learning product development. It is a systematic and continuous method to appraise the quality, efficiency, and effectiveness of a program, process, procedure, or product. It provides the mechanism for decision-makers to ensure the application of consistent standards of quality. All institutions must conduct evaluations on a continual basis pursuant to DA and TRADOC policy and guidance.

Experiential learning

The assumption is learners bring experience and knowledge to the classroom. Learners construct knowledge by synthesizing their real-world experiences and their experiences in the classroom. Learners receive both formative and summative assessments from faculty and peers throughout the course. Experiential Learning creates learning that lasts by balancing both cognitive and affective domains. It allows learners to exercise critical reasoning and creative thinking by identifying problems and working collaboratively to develop possible solutions.

External evaluation

The evaluation process that provides the means to determine if the training and training products received meet the needs of the operational Army and the training institution continues to produce graduates and training products that meet established job performance requirements. (AR 350-1)

Formative assessment

A range of formal and informal assessment procedures employed by instructor/facilitators during the learning process in order to modify teaching and learning activities to improve learner attainment. Formative assessments monitor progress toward goals within a course of study. It typically involves qualitative feedback (rather than scores) for both learner and instructor/facilitator that focus on the details of content and performance.

Formative evaluation

The monitoring of a learning product as it proceeds through the ADDIE process to make sure the product achieves the desired outcome/objective. This is a check-on-development to control the quality of the learning products developed and their implementation. (TR 350-70)

Functional courses

Courses designed to qualify Soldiers and DA Civilians for assignment to duty positions that require specific functional skills and knowledge.

Gap analysis

This is a component of the Analysis Phase. Gap Analysis compares the desired educational outcome with the learner's pre-instruction foundational knowledge as determined by the Target Audience Analysis.

General Learning Outcome

GLOs are essential outcomes resulting from training, education, and experience along a career continuum of learning.

Goal analysis

This is a component of the analysis phase. Goal analysis identifies specific performance or action statements from broadly stated course outcomes or educational outcomes. The goal analysis determines the domains of knowledge that developers encompass in the course outcomes, which may also include a list of the subjects the learner must learn. These performance or action statements can then be broken down into skill and knowledge components and translated into learning objectives from which to base the design and development of lessons that comprise the course.

Graphic training aid

A product created to enable trainers to conduct and sustain training in lieu of using extensive printed material or expensive equipment. GTAs may also increase performance during on-the-job training or as JAs.

Group trial

Group trial(s) is a process used to validate a lesson/lesson plan's individual objectives, based on observations and statistical analysis. The trial(s) allow the training developer to gather information, by exposing a group of volunteers from the target audience, or a group of volunteers that possess the critical characteristics of the target audience, to the instructional materials.

Implementation

A phase in the ADDIE process that is the conduct and delivery of the course/event in accordance with how the course/event was designed. Implementation applies to the OISD training domains and includes learner assessment to measure achievement of standards and course outcomes. Implementation of learning products must also include program or course evaluation for continuous improvement of course/event conduct and learning.

Individual assessment plan

A plan that details how the proponent school will determine whether the student has demonstrated a sufficient level of competency to pass the specified course or training. It specifically identifies course completion requirements to include the minimum passing score (or GO/NO-GO) for each written or performance examination, final grade requirement, minimum course attendance requirements (if applicable), and specific assessments that must be satisfactorily completed to graduate. It very specifically identifies how the student's performance will be evaluated. Specific lessons assessed in each assessment are identified. Counseling and retesting policy are delineated. Other evaluations are identified that impact on graduation, such as the Army Weight Control (Body Composition) Program and Army fitness, and their requirements are included.

Individual critical task

An individual critical task is a task that a Soldier and/or a DA Civilian performs to accomplish their mission and duties and to survive in battle and during other military operations. It is a subset of the total task inventory.

Individual critical task list

An ICTL is the list of critical tasks that job incumbents must perform to accomplish their missions and duties. A CTSSB develops the ICTL from a list of all tasks identified during a job analysis.

Individual task

A clearly defined and measurable activity accomplished by individuals. An individual task supports one or more collective tasks or drills and often supports another individual task. An individual task must be specific and have a definite beginning and ending. Use the construct of action, condition(s), and standard(s) to produce an individual task to ensure the task can be assessed against established performance standards that are observable, measurable, and achievable. An individual task is the lowest behavioral level in a job performed for its own sake.

Individual training plan

The ITP is a long-range planning document that articulates the proponent's career-long learning strategy for a MOS, area of concentration, or separate functional area.

Institutional training domain

The Army's institutional training and education system, which primarily includes training base centers and schools that provide initial training and subsequent PME for Soldiers, military leaders, and DA Civilians. (ADP 7-0)

Instructional design

The process of creating learning products that enhances the quality, efficiency, and effectiveness of education and training.

Instructional material

Material used by instructors/facilitators and/or learners in formal courses, including training aids, commercial publications, visual aids, etc.

Instructional strategy

It describes the process of organizing and specifying learning activities and content delivery. Design an instructional strategy to achieve an overall aim of imparting knowledge using particular methods of instruction.

Instructor actions

Additional, scheduled actions that the instructor must undertake to execute the POI. IAs are performed every time the POI is executed, and they are performed in the same manner and at the same course juncture each time. They typically occur between POI lessons, and should not be duplicative of tasks/hours that already earn ICH credit within the POI. IAs capture the instructor's work hours in support of the POI when they are not with the students formally executing the POI lessons.

Instructor contact hours

The workhour an instructor devotes to the delivery of learning content to students to accomplish the course learning objectives during the academic day.

Interactive multimedia instruction

The IMI is a group of computer-based training and support products. The group of products includes source materials commonly used in IMI products, electronic products used for the delivery of or supporting the delivery of instruction, and software management tools used to support instructional programs. The IMI products include computer-aided instruction, computer managed instruction, interactive courseware, electronic publications, electronic testing, electronic guides, and simulations. (AR 350-1)

Internal evaluation

The evaluation process that provides the means to determine whether the training and training development efforts have accomplished what was intended. It determines if the objectives of the training have been met and verifies the effective use of the ADDIE process to meet minimum essential analysis, design, development, implementation and evaluation requirements. (AR 350-1)

Job

A job is a collection of unique, specific, and related activities (tasks or skills) performed by a unique, defined set of personnel.

Job aid

A supporting product that can be a checklist, procedural guide, decision table, worksheet, algorithm, or other device used as an aid in performing duty position tasks.

Job analysis

Job analysis is a type of analysis used to identify individual tasks (including leader tasks) and, at times, the associated knowledge, skills and attitudes a job incumbent must know or perform to accomplish the mission and duties of a specific MOS. The output of a job analysis is a total task inventory.

Knowledge

Knowledge is job-related information analyzed to provide meaning, value, and understanding to perform skills, activities, or job functions. Knowledge is defined as comprehension gained by deliberate, systematic, sustained effort through study, experience, practice, and human interaction that provides the basis for expertise and skilled judgment. A knowledge is an element of critical learning requirements that may be used to facilitate learning content design and development. Knowledge may also be classified into four different types, which can assist the TNGDEV in articulating effective learning objectives. These four types of knowledge are factual knowledge (terminology, specific details and elements); conceptual knowledge (classifications, categories, principles, generalizations, theories, models and structures); procedural knowledge (subject-specific skills and algorithms, subject-specific techniques and methods, criteria for determining when to use appropriate procedures); and metacognitive knowledge (strategic knowledge, knowledge about cognitive tasks, including appropriate contextual and conditional knowledge, self-knowledge).

Learning

Learning is a process of acquiring new, or modifying existing knowledge, behaviors, skills, values, or preferences and may involve synthesizing different types of information. Learning involves a change in the behavior of the learner because of experience. The behavior can be physical and overt, or it can be intellectual or attitudinal.

Learning assessment

A learning assessment is the measurement of an individual learner's performance pre-instruction and post-instruction, to verify attainment of the knowledge, skills and attitudes specified in the learning objective(s) and attainment of the learning outcome(s) of the lesson and/or course.

Learning objective

Learning objective consists of a three-part statement with an action, condition, and standard. This statement clearly and concisely describes learner performance at the prescribed level of learning required to demonstrate proficiency in the instructional material. Derive learning objectives from task/proficiency performance specifications. Objectives serve as the foundation for instructional design, provide the basis for instructional strategy decisions and criterion tests, establish clear and concise learner goals, and determine content.

Learning outcome

A statement that indicates the level and type of competence a learner will have at the end of a course. The specification of what a learner should learn as the result of a period of specified and supported study.

Learning product

Any training or education deliverable developed by the proponent to deliver learning content. Critical learning requirements are the basis for learning products. Learning products support defined learning outcomes and are simple or complex depending on the content involved. Examples of institutional learning products are career maps, TRAS documents (ITP, POI, and CAD), lesson plans, learning objectives, individual tasks, ICTLs, and TSPs.

Learning step activity

LSAs are the foundation for a lesson. LSAs also provide a structured means to focus learning on a small part of what a learner needs to learn, and provide the basis for identifying specifications, including such items as the method of instruction and resources required to present the lesson.

Lesson

A period of time where learning is intended to occur. During a lesson, an instructor teaches learners a particular subject or teaches how to perform a particular activity. A lesson provides the instructional content for a lesson plan.

Lesson plan

A lesson plan is the detailed development of information and resources used by instructors/facilitators to execute the instruction prescribed in one lesson within the prescribed time limits using the specified resources. A lesson plan includes the content and supporting information for only one lesson that supports the learning and assessment of one TLO (or one or more course TLOs).

Mandatory training

Training required on specific subjects as required by law, DOD, and/or HQDA. Mandatory training may apply to units, institutions, and DA Civilians.

Master evaluation plan

The planning document that provides the proponent's overall strategy for accomplishing all evaluation requirements for the next FY and evaluation/QA function projections for the following three years. The MEP provides specific program descriptions. QAOs develop and post MEPs to the TRADOC QAO website with a cover memorandum signed by the commander/commandant and EXSUM (signed by the QAO director) annually, no later than 1 June. (TR 11-21)

Media

Any means or instrument of communication (auditory, visual, or written) that is used as a part of an instructional sequence to demonstrate or clarify course content and to facilitate learning or increase comprehension of course material. Examples include video, printed material, and audio.

Method of instruction

A type of activity used to facilitate the accomplishment of the learning objective(s). Specific methods require varying degrees of learner participation. Selection of the best MOI requires consideration of the learner, the content, the goals, the learning environment, the instructor/facilitator, and the available resources.

Mission analysis

Mission analysis is a process to review mission requirements and develop a UTL. This process identifies unit, organizational, and functional structure, stated and implied missions, and collective and individual tasks.

Module

A module is a group of multiple related lessons that promotes efficiency in the course structure. In rare cases, a module may be comprised of only one lesson based on a single TLO.

Needs analysis

Needs analysis is a process that identifies gaps between current and required Army operational capabilities or performance.

Operational tempo

The rate at which a single system is projected to be reasonably used for training in a single iteration of a designated course. Expressed rates are in miles, hours, or systems. Base direct OPTEMPO costs on POI pricing which will include ammunition, equipment, facilities, and manpower. Indirect OPTEMPO includes travel, contracts, supplies, and equipment. (TP 350-70-9)

Phase

A major part of a course that may be taught at different locations. Phases are required as a necessary break-up of a course version due to time, location, equipment, facility constraints, or delivery options such as nonresident/DL, IMI, resident, or any combination. For resourcing purposes, a phase is an instructional unit identified by a common course title and number consisting of curriculum inclusive of critical tasks or educational requirements constructed as a portion or segment of a course.

Planning, programming, budgeting, and execution

The process for justifying, acquiring, allocating, and tracking resources in support of Army missions. (AR 1-1)

Practical exercise

A technique used during a training session that permits students to acquire and practice the knowledge, skills and attitudes necessary to successfully perform one or more training objectives.

Professional military education

Progressive levels of military education that convey the broad body of knowledge and professional competence essential for the military professional's career progression.

Program of instruction

A TRAS requirements document that provides a specific description of course content, duration of instruction, types of instruction, and lists resources required to conduct the course/phase.

Proponent

Army organization or staff element designated by the HQDA DCS, G-3/5/7 that has primary responsibility for materiel or subject matter expertise in its area of interest or is charged with accomplishment of one or more functions.

Quality control

The process and activities management and employees use to gather process data systematically to determine product quality. Leaders establish process standards and management analyzes the gathered data. QC results determine changes in processes, staff training requirements, and administrative procedure improvements, as necessary.

Reserve Component

The RC is composed of both the USAR and the ARNG.

Resource analysis

Resource analysis is a component of the analysis phase in which the developer or author identifies resources and constraints.

Rubric

A guide listing specific criteria for grading or scoring academic papers, projects, tests, classroom participation, and briefings. Rubrics assess levels of learner achievement of proficiencies.

Self-paced learning

Individuals move through the course at varying rates according to parameters established during validation. Learners move through the course individually at their own speed and are not dependent on group times.

Seminar

A seminar is an advanced course of study for discussion and research under the guidance of a recognized expert.

Skill

A skill designates one's ability to perform a job-related activity, which contributes to the effective performance of a task performance step. Skill is an element of critical learning requirements that may be used to facilitate learning content design and development. There are three types of skills: physical (psychomotor), mental (cognitive), and emotional (affective).

Soldier training publication

A training publication that contains critical tasks and other information used to train all Army Soldiers to the same standards. It provides guidance on the conduct of individual Soldier training in the unit and aids all Soldiers in the training of critical tasks. (AR 350-1)

Standard

The accepted proficiency level required to accomplish a task or learning objective. In Army learning, standard is a statement that establishes the criteria for how well a task or learning objective is performed. The standard specifies how well, completely, or accurately a process is performed or product is produced.

Student handout

A booklet, schematic, circuit diagram, table, or similar material that augments the study guide, workbook, learner text, or otherwise supports course objectives.

Subject matter expert

A SME is an individual with a thorough knowledge of a job (duties and tasks). This knowledge qualifies the individual to assist in the training development process (such as, consultation, review, analysis). Normally, SMEs instruct in their area of expertise.

Summative assessment

A summative assessment is a process that concentrates on learner outcomes rather than on the POI. It is a means to determine learners' mastery and comprehension of information, skills, concepts, or processes. Summative assessments occur at the end of a formal learning/instructional experience, either a class or a program and may include a variety of activities (for example, tests, demonstrations, portfolios, internships, clinical experiences, and capstone projects).

Summative evaluation

A process that concerns the final evaluation to determine if the project or program met its goals. Typically, the summative evaluation concentrates on the POI and the learning products. (TR 350-70)

Sustainable Readiness

The Army's force generation process postures the Army to manage risk effectively while preparing a force that is more agile, adaptive, and necessary to win in a complex world. (AR 350-1)

Synchronization meeting

Synchronization meetings are institutional meetings that involve FSD and delivery activities that support the Army mission. Meetings include representatives from the operational training domain and all components: Regular Army, USAR, and ARNG. The meetings coordinate training and education solutions, publish authoritative documents covering respective functional areas of responsibility that provide the justification for learning product production, and ensure support to the Army mission. Examples of synchronization meetings include CTSSBs, course CDR, and PICs.

Synchronous learning environment

The synchronous learning environment supports communication in which interaction between the participants is simultaneous through two-way audio or video, computer document conferencing, or chat rooms. (AR 351-9)

Target audience analysis

Target audience analysis is a component of the analysis phase. Target audience analysis uses the following elements to inform curriculum design, development, and implementation. A target audience analysis may identify the following elements during analysis characteristics, knowledge, existing experiences, attitudes, reading grade level, workplace conditions, demographics, ASVAB scores required for the job, computer or device literacy, size of population, location(s) of population, maturity, motivation to learn, and interests.

Task

A clearly defined and measurable activity accomplished by individuals and organizations. It is the lowest behavioral level in a job or unit performed for its own sake. It must be specific; usually has a definite beginning and ending; may support or be supported by other tasks; has only one action and, therefore, is described using only one verb; generally, is performed in a relatively short time (however, there may be no time limit or there may be a specific time limit); and must be observable and measurable. The task title must contain one action verb and an object and may contain a qualifier.

Task reinforced

Task reinforced (identified in a lesson plan) is the task for which the lesson provides refresher training. The task reinforced was completely trained in a previous lesson(s) within the course.

Task selection model

A model used to apply statistically valid task selection data to identify critical individual tasks. There is a variety of models available for use. Those commonly used are below:

- a. DIF model - An individual critical task selection model that uses difficulty, importance, and frequency factors.
- b. Eight-factor model - An individual critical task selection model that uses percent performing, percent time spent performing, consequence of inadequate performance, task delay tolerance, frequency of performance, task learning difficulty, probability of deficient performance, and immediacy of performance.
- c. Four-factor model - An individual critical task selection model that uses percent performance and task learning difficulty.
- d. Probability of task criticality model - An individual critical task selection model used by the occupational data, analysis, requirements, and structure program.
- e. Training emphasis model - An individual critical task selection model that uses the training emphasis factor to determine if a task is critical or not. Supervisors of jobholders collect the TE

factor. It reflects the level of emphasis the task has in training for a specific task. The TE is the most useful single training factor for critical task selection.

Task supported

Task supported is an individual task partially taught in the lesson. Not all of the task's knowledge, skills, and/or performance steps are taught in the lesson.

Note. The rest of the task is taught in another lesson or across other lesson plans.

Task taught

Task (identified in a lesson plan) that the lesson either completely trains to the standard, or the lesson results in the completion of training of the task to the standard within the course. Trains the remaining knowledge, skills or performance steps of the task supported in previous lesson(s) within the course.

Terminal learning objective

The TLO is the main objective at the lesson-level or an objective at the course or module level. The TLO describes what the learner must do at the end of the lesson/course or module to demonstrate acceptable performance in observable, measurable, and achievable terms. A TLO may be identical to the task/skill/knowledge it covers. Additionally, none of the ELOs can be at a higher learning level than the TLO.

Test

A means of examination, trial, or proof designed to determine knowledge or competency; determine if a student or group can accomplish the objective to the established standard; determine if training does what it is designed to do, efficiently and effectively; or measure the skill, knowledge, intelligence, abilities, or other aptitudes of an individual or group. (TP 350-70-5)

Test control

The protection of tests, test items, and related sensitive material from unauthorized disclosure from the time of their creation until they become obsolete or destroyed through the application of security measures.

Test validation

A process used to determine if a test measures the intended objectives.

Total task inventory

The total task inventory is a comprehensive list of all individual tasks an incumbent performs as part of a job. A CTSSB derives a list of critical tasks for the job from this inventory.

Training circular

A publication (paper or computer-based) that provides a means to distribute training information that does not fit standard requirements for other established types of training publications.

Training and education development

The process of developing, integrating, prioritizing, resourcing, and providing QC/QA of the Army's training and education concepts, strategies, and products to support the Army's training and education of RA and RC Soldiers, DA Civilians, and units across the OISD training domains.

Training development capability

TDC is the automated development tool used to inform Army electronic repositories and other automated development tools with learning content and resource requirements. TDC supports the automated sharing of learning content and resource information. Use TDC to develop, store, and manage learning products for all training domains.

Training requirements analysis system

TRAS integrates the training development process with planning, programming, budgeting, and execution by documenting training strategies, courses, and related resource requirements. The TRAS integrates external resource acquisition systems for learners, instructors, equipment and devices, ammunition, dollars, and facilities with the training development and implementation process. TRAS documents enable Army training institutions to plan and support the development and implementation of individual training courses. (TP 350-70-9)

Training support package

A TSP is a complete, exportable package that integrates training products, materials, and/or information necessary to train one or more tasks or learning objectives. The contents will vary depending on the training site and user. A TSP for collective training is a package used to train critical collective and supporting individual critical tasks (including leader and battle staff).

Triangulation

A method used in qualitative research that involves crosschecking multiple data sources and collection procedures to evaluate the extent to which all evidence converges. Often, other sources of information supplement qualitative analysis of text to satisfy the principle of triangulation and increase trust in the validity of the study's conclusions. An example is to analyze transcribed interviews along with observational field notes and documents authored by the respondents themselves. The purpose of multiple sources of data is corroboration and converging evidence.

Unit task list

The set of collective tasks that a unit is doctrinally designed to perform. The primary output of a mission analysis is the UTL. The UTL provides the baseline for all unit training and education products. A training developer creates the UTL by linking all existing collective tasks (shared and unique) or identifying collective tasks for design and development for a specific unit supporting its mission requirements and capabilities. (TP 350-70-1)

Validation

The process used to determine if new/revised courses and training products/materials accomplish their intended purpose efficiently and effectively. It is the process used to determine if training accomplishes its intended purpose. Validation and revising training are continuous actions in the

teaching/revising process of training improvement. Validation is of the training products themselves, and not of the training site.

Written test

Instrument used to sample each learning objective and, when necessary performance objective knowledge components. Tests can be unit, module, block, or end-of-course tests administered in a formal testing mode during time allotted in the POI.

Section III**Special Abbreviations and Terms****Education**

A structured process that conveys both specific and general bodies of knowledge and develops habits of mind applicable to a broad spectrum of endeavors. As viewed through the prism of “psychomotor, cognitive, affective learning,” education is largely defined through cognitive learning and fosters breadth of view, diverse perspectives, critical and reflective analysis, abstract reasoning, comfort with ambiguity and uncertainty, and innovative thinking, particularly with respect to complex, ill-structured or non-linear problems.

Training

A learning event designed to develop, maintain, or improve the capability of individuals or units to perform specified tasks or skills. As viewed through the prism of “psychomotor, cognitive, and affective learning,” training is largely defined through psychomotor learning and fosters mastery of established performance standards in the operational environment.