SYSTEMS APPROACH TO TRAINING (SAT) MANUAL

JUNE 2004

UNITED STATES MARINE CORPS
MARINE CORPS COMBAT DEVELOPMENT COMMAND
QUANTICO, VIRGINIA 22134-5001

IN REPLY REFER TO:
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C469

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FORWARD

1. PURPOSE

The Systems Approach to Training (SAT) Manual has been prepared for use as an extension of the Marine Corps Training and Education Orders (1553 Series, Cornerstone Orders). Developed in support of instructional theory and the Department of Defense MIL-STD-1379D (Military Training Programs), the SAT Manual is the primary source of information for instructional program development and management for Marine Corps' formal schools, training centers, and formal courses of instruction collocated at other military service schools. It may also be a useful resource in Fleet Marine Force training, such as that conducted at Division Schools and in unit training programs and courses.

2. SCOPE

The Systems Approach to Training, based on Instructional Systems Development (ISD), was established to manage the process of analyzing, designing, developing, implementing, and evaluating instructional programs. To illustrate the process of instructional program development from start to finish, the five phases of SAT are presented sequentially in this Manual. In actuality, these phases overlap and are interrelated, and some procedures of each phase may be performed at various times throughout the life of an instructional program. The SAT is a dynamic, flexible system that, when applied, provides for effective and efficient instruction.

3. CHANGES

Formative evaluation on the coordinating draft (SAT User's Manual) is complete. Recommended changes submitted by commands were reviewed, with many changes incorporated into this the final SAT Manual. Recommendations for further improvements to this publication are always encouraged from commands; these recommendations should be submitted by using and forwarding the enclosed Suggestion Form to:

Commanding General
Training Command
Training and Education Division (C469)
2008 Elliot Road
Quantico, Virginia 22134-5029

4. RESERVE APPLICABILITY

The SAT Manual is applicable to the Marine Corps Reserve.

5. CERTIFICATION

Reviewed and approved this date.

J. W. BEAROR
Chief of Staff, Training Command
Training and Education Command, Quantico, Virginia

DISTRIBUTION: All Marine Corps' Formal Schools, training centers, formal courses of instruction collocated at other military service schools, and FMF MSE G-3s

SUGGESTION FORM

From:

Subj: RECOMMENDATION FOR IMPROVEMENT TO THE SAT MANUAL

1. In accordance with the Forward to the Systems Approach to Training (SAT) Manual, which encourages commands to provide suggestions for improving the publication; the following unclassified recommendation is submitted:

_____	_____	_____	_____
Page	Para. No.	Line No.	Figure/Appendix

Nature of Change: ___Add ___Delete ___Change___Correct

2. Proposed New Text: (Verbatim, double-spaced; continue on additional pages, if necessary.)

3. Justification/Rationale/Impact of Proposed Change: (Include source; may be single spaced.)

PREFACE

The Systems Approach to Training (SAT) Manual was developed to support Marine Corps training/education policy and Department of Defense (DoD) military training program requirements. This Manual serves as a primary source of information and guidance, mainly for use by the formal school/training centers' instructional staff, for instructional program development and management.

The SAT Manual is divided into five chapters, each chapter corresponding to a phase within the SAT model: Analyze, Design, Develop, Implement, and Evaluate. In many of the sections within each chapter, topic material is presented first, followed by procedural steps for performing a task or function. Throughout the Manual, hypothetical examples are provided to illustrate a concept, topic, or procedure.

While the information contained in the SAT Manual is based on and derived from accepted adult learning theories and current instructional development practices, the Manual is designed as an introduction to these topics. Additional research in education-related fields is recommended for those personnel who participate in the development or management of instruction.

EXECUTIVE SUMMARY

Overview. The mission of any instructional system is to determine instructional needs and priorities, develop effective and efficient solutions to achieving these needs, implement these solutions in a competent manner, and assess the degree to which the outcomes of the system meet the specified needs. To achieve this in the most effective way possible, a systems approach to the process and procedures of instruction was developed. The resulting model, entitled Instructional Systems Design (ISD), was later adopted by the Marine Corps as the Systems Approach to Training (SAT). The model, whether it is referred to as ISD or SAT, is a recognized standard governing the instructional process in the private sector and within the Department of Defense (DoD).

Goal of Instruction

The goal of Marine Corps instruction is to develop performance-based, criterion-referenced instruction that promotes student transfer of learning from the instructional setting to the job. For a learning outcome to be achieved, instruction must be effective and efficient. Instruction is effective when it teaches learning objectives based on job performance requirements and efficient when it makes the best use of resources.

SAT is a comprehensive process that identifies what is performed on the job, what should be instructed, and how this instruction should be developed and conducted. This systematic approach ensures that what is being instructed are those tasks that are most critical to successful job performance. It also ensures that the instructional approach chosen is the most time and cost efficient. The SAT process further identifies standards of performance and learning objectives. This ensures that students are evaluated on their ability to meet these objectives and that instructional courses are evaluated based on whether or not they allow student mastery of these objectives. Finally, the SAT identifies needed revisions to instruction and allows these revisions to be made to improve instructional program effectiveness and efficiency.

Intent of SAT

The SAT was created to manage the instructional process for analyzing, designing, developing, implementing, and evaluating instruction. The SAT serves as a blueprint for organizing or structuring the instructional process. The SAT is a set of comprehensive guidelines, tools, and techniques needed to close the gap between current and desired job performance through instructional intervention.

The Marine Corps originally targeted the SAT for use in formal schools, but the comprehensive system applies to unit/field training as well as to education. The SAT is a flexible, outcome-oriented system based on the requirements defined by education and training. Whether referred to as education or training, the instructional process is the same; it is the outcomes that are different. Therefore, in keeping with the intention of the SAT model, throughout this SAT Manual, the term instruction will be used to discuss both training and education.

Benefits of SAT

The Systems Approach to Training is a dynamic, flexible system for developing and implementing effective and efficient instruction to meet current and projected needs. The SAT process is flexible in that it accounts for individual differences in ability, rate of learning, motivation, and achievement to capitalize on the opportunity for increasing the effectiveness and efficiency of instruction. The SAT process reduces the number of school management decisions that have to be made subjectively and, instead, allows decisions to be made based on reasonable conclusions which are based on carefully collected and analyzed data. More than one solution to an instructional problem may be identified through the SAT, however the selection of the best solution is a goal of SAT.

The SAT is a continuous, cyclical process allowing any one of the five phases, and their associated functions, to occur at any time. In addition, each phase within SAT further builds upon the previous phase, providing a system of checks and balances to insure all instructional data are accounted for and that revisions to instructional materials are identified and made.

It is not the intent of the SAT process to create an excessive amount of paperwork, forms, and reporting requirements that must be generated by each formal school/training center conducting instruction. This would serve only to detract from the instructional program. The SAT process does not provide a specific procedure for every instructional situation that can be encountered. Instead, it presents a generalized approach that can be adapted to any instructional situation.

SAT Phases. The SAT model simplifies and standardizes the instructional process into manageable subsets. The SAT process is made up of five distinct phases, each serving a specific purpose. The five phases are Analyze, Design, Develop, Implement, and Evaluate. Each of these phases involves inputs, a process, and outputs. The successive phases of the SAT build upon the outcomes of the previous phase(s).

1. Analyze. During the Analyze Phase of SAT, a particular job or Occupational Field/Military Occupational Specialty (OccFld/MOS) is analyzed by Marine Corps Combat Development Command (MCCDC, C 461) to determine what job holders perform on the job, the order in which they perform it, and the standard of performance necessary to adequately perform the job. The result, or outcome, of the Analyze Phase is Individual Training Standards (ITS) selected for instruction. ITSs are behavior statements that define job performance in the Marine Corps and serve as the basis for all Marine Corps instruction. The elements of the Analyze Phase are:

Job Analysis. Job or occupational analysis is performed to determine what the job holder must know or do on the job. Job analysis results in a verified list of all duties and tasks performed on the job.

Task Analysis. Task analysis (sometimes called Training Analysis) is performed to determine the job performance requirements requisite of each task performed on the job. Job performance requirements include a task statement, conditions, standard, performance steps, administrative instructions, and references. Job performance requirements in the Marine Corps are defined by Individual Training Standards (ITSs). ITSs define the measures of performance that are to be used in diagnosing individual performance and evaluation of instruction.

Selection of Tasks for Instruction. Current instructional needs are determined by selecting tasks for instruction. Tasks are selected based on data collected concerning several criteria relating to each task. A by-product of this process is the determination of the organization responsible for conducting the instruction and the instructional setting assigned to each task.

Input	Process	Outcome
Job task data	Job analysis	Task List
	Task analysis	Individual Training Standards (ITS) Instructional Setting

2. Design. During the Design Phase of SAT, formal school/training center instructional developers equate task performance under job conditions (ITSS) to task performance within the instructional setting (learning objectives). The goal of this phase is to simulate as closely as possible the real-world job conditions within the instructional environment. The closer the instructional conditions are to the required in the work setting, the more likely it is that the student will transfer the learning to the job. The Design Phase is made up of five separate sections, each of which has a specific purpose:

Write a Target Population Description (TPD). The TPD defines the student population entering a course.

Conduct Learning Analysis. The learning analysis is conducted to develop the learning objectives. The learning analysis describes what the students will do during instruction.

Write Test Items. Test items are derived from the learning objectives and are used to determine if the students have mastered the learning objectives.

Select Delivery System. The delivery system is the primary means by which the instruction is presented to the students.

Sequence Learning Objectives. Learning objectives are sequenced to allow students to make logical transitions from one subject to the next. Sequenced learning objectives provide efficient instruction and serve as a draft course structure.

Input	Process	Outcome
ITS	Define student population	Target Population Descripton (TPD)
	Conduct learning analysis	Learning Objectives
	Define evaluation	Test Items
	Select media and method	Delivery System
	Organize instruction	Sequenced Terminal Learning Objectives (TLO)

3. Develop. The Develop Phase of SAT builds on the outcomes of the Analyze and Design Phases. The Analyze Phase identifies those tasks to be instructed and the desired standard to which those tasks must be performed. The Design Phase outlines how to reach the instructional goals determined in the Analyze Phase by converting job tasks to tasks taught in the instructional environment, and further builds the foundation for instruction. During the Develop Phase, instructional developers from the formal schoo1/training center modify the instructional program to fit the requirements identified in the Analyze and Design Phases. The elements of the Develop Phase are:

Develop Course Schedule. The course schedule provides a detailed structure for the course to include lesson times, titles, designators, locations, and references to be used.

Develop Instruction. This section details the process for developing the lesson plans and supporting course materials that instructors will present during the Implement Phase. Maximizing the transfer of learning is the goal of developing instruction.

Develop Media. This section takes the media selected during the Design Phase and develops them into their final form for presentation to the students. The purpose of media is to enhance the instruction and the transfer of learning by presenting lesson material in a manner that appeals to many senses, complements student comprehension level, and stimulates student interest.

Validate Instruction. The goal of validation is to determine the effectiveness of instructional material and to make any necessary revisions prior to implementation.

Develop Course Descriptive Data (CDD) and Program of Instruction (POI). The CDD provides a detailed summary of the course including instructional resources, class length, and curriculum breakdown. The POI provides a detailed description including structure, delivery system, length, learning objectives, and evaluation procedures. A formal course of instruction must have an approved POI.

Input	Process	Outcome
Learning Objectives	Organize course	Course Schedule
TPD	Develop Instruction	Master Lesson Files (MLF)
Delivery System	Develop media	Media
Test Items	Validate Instruction	Revised instructional materials
	Develop supporting course materials	CDD/POI

4. Implement. During the Implement Phase of SAT, instructors within the formal school/training center prepare the class and deliver the instruction. The purpose of the Implement Phase is the effective and efficient delivery of instruction to promote student understanding of material to achieve student mastery of learning objectives, and to ensure a transfer of student knowledge from the instructional setting to the job. The elements of the Implement Phase are:

Prepare for Instruction. Preparation involves all those activities that instructors and support personnel must perform to ready themselves for delivering the instruction.

Implement Instruction. Implementing instruction is the culmination of the analysis, design, and development of instructional materials. Although the instructional developer designed and developed the instructional material so that it maximizes transfer of learning, the way the instructor presents the material will play a crucial part in determining whether students learn and transfer that learning to the job. Implementation is the instructor's delivery of instruction to the students in an effective and efficient manner.

Input	Process	Outcome
Instructional Materials	Prepare for instruction	Delivery of instruction
	Implement instruction	Course data

5. Evaluate. The Evaluate Phase of SAT measures instructional program effectiveness and efficiency. Evaluation and revision drive the SAT model. Evaluation consists of formative and summative evaluation and management of data. Formative evaluation involves validating instruction before it is implemented and revising instruction to improve the instructional program prior to its implementation. Formative evaluation is ongoing at all times both within and between each phase of the SAT model. Summative evaluation is conducted after a course of instruction has been implemented. Summative evaluation assesses the effectiveness of student performance, course materials, instructor performance, and/or the instructional environment. There are three parts to evaluation:

Plan and Conduct. The purpose of planning and conducting evaluation is to develop and implement a strategy for determining the effectiveness and efficiency of an instructional program.

Analyze and Interpret. After the evaluation data have been gathered during the conduct of evaluation, the results are analyzed and interpreted to assess instructional program effectiveness and efficiency.

Document and Report. Evaluation data is managed and the results of evaluation are documented and reported so that instruction is revised, if necessary.

Input	Process	Outcome
Course Data	Conduct Formative Evaluation	Revisions to instruction
	Conduct Summative Evaluation	Data on instructional effectiveness
	Manage Data	Course Content Review Board (CCRB)

SYSTEMS APPROACH TO TRAINING MANUAL

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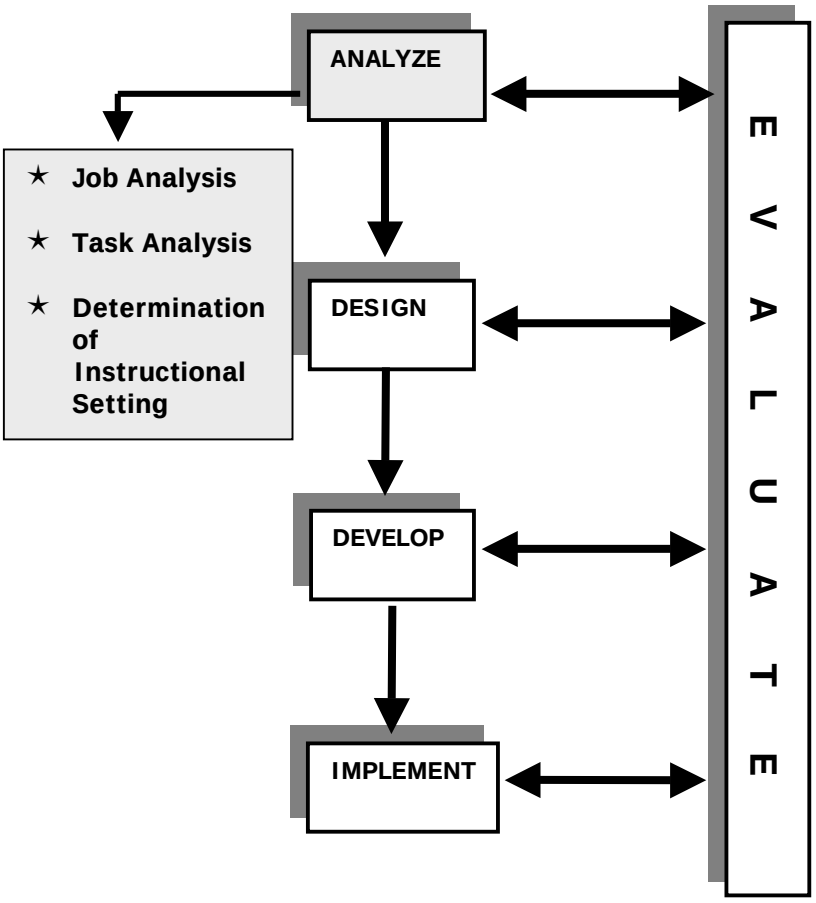
ANALYZE PHASE



In Chapter 1:

Chapter 1

1000. INTRODUCTION

The Analyze Phase is a crucial phase in the Systems Approach to Training (SAT) process. During this phase, job performance data is collected, analyzed, and reported. This analysis results in a comprehensive list of tasks and performance requirements selected for instructional development. In the Marine Corps, job performance requirements are defined as Individual Training Standards (ITS) Orders and Training and Readiness (T&R) Manuals. The Analyze Phase consists of three main processes: job analysis, task analysis, and determining instructional setting.

This chapter has four separate sections. The first three cover the three Analyze Phase processes and the fourth provides the administrative responsibilities.

1. **Job Analysis:** "What are the job requirements?"
2. **Task Analysis:** "What are the tasks required to perform the job?"
3. **Determine Instructional Setting**: "Will the Marine receive job training in a formal school/detachment setting or through MOJT?"
4. **Requirements and Responsibilities in the Analyze Phase**: "What are the roles and responsibilities of each element in the training establishment?"

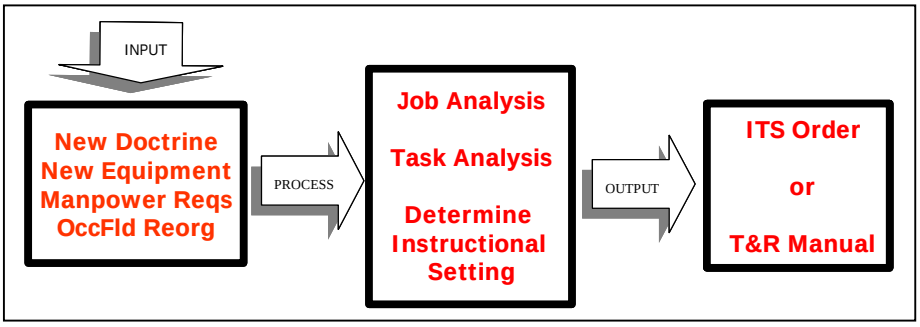


Figure 1-1

1100. PURPOSE

Section 1

The purpose of the Analyze Phase is to accurately determine what the Marine must know and do on-the-job. Job Analysis is done through a systematic research process called the Front-End Analysis (FEA) to collect, collate, and report job performance data. Task analysis is accomplished by convening a Subject Matter Expert (SME) conference. This conference, attended by representatives from the operating forces, formal school, occupational field sponsor, and TECOM, reviews the results of the FEA and produces a draft ITS Order to describe training standards. SMEs then determine the instructional setting for each task and finally produce the draft Target Population Description (TPD). The draft ITS/T&R is then staffed and, when final changes are made, it is published in the MCO 1510 or 3500 series.

A Front-End Analysis is a process utilized to collect, collate, and report job performance.

The formal schools are responsible for reviewing the signed ITS/T&R to identify those tasks/events that they are responsible for teaching. The curriculum developers then enter the relevant tasks into MCAIMS and begin the development of the Program of Instruction. To accelerate the design and development phases of the SAT process, schools can begin the process of entering the tasks into MCAIMS from the draft ITS/T&R that is published immediately following the SME conference.

As part of instruction, formal schools and detachments design, develop, implement, and evaluate their curricula based on existing ITS/T&R. The development of ITS/T&R within the Analyze Phase is unique to TECOM, and is normally performed under the guidance of Ground Training Branch (GTB) or Aviation Training Branch (ATB). Formal schools/training detachments within the Marine Corps will not attempt to develop ITS/T&R independently without prior approval of TECOM (GTB/ATB).

1. When ITS/T&R already exist for an MOS, the school developing instruction for that MOS does not have to analyze the job. However, the formal school/detachment is responsible for reviewing the ITS/T&R for accuracy and completeness, and for recommending changes to TECOM (GTB/ATB).
2. If the ITS/T&R is awaiting signature following an SME conference, the school responsible for instruction should obtain authorization from CG, TECOM to commence course design, development, and implementation based on the draft training standards.

The results of this phase form the basis for the entire instructional process by clearly defining the target population, what Marines are actually performing on the job, what they will need to learn in the formal school, and what will be learned though managed on-the-job training (MOJT). The Analyze Phase is concerned with generating an inventory of job tasks, selecting tasks for instruction, developing performance requirements, and analyzing tasks to determine instructional setting.

Section 2

Job analysis involves finding out exactly what the Marine does on the job rather than what the Marine must know to perform the job.

1200. JOB ANALYSIS

The first step in the Analyze Phase is the completion of a Job Analysis that is conducted through the FEA process. TECOM (GTB) collects, examines, and synthesizes data regarding each Occupational Field/Military Occupational Specialty (OccFld/MOS). This data may include time in grade and MOS, career progression, tasks performed on the job, instructional location, level of instruction, etc. Job analysis is the collection and organization of data that results in a clearly defined description of duties, tasks, and indicative behaviors that define that job. Job analysis involves finding out exactly what the Marine does on the job rather than what the Marine must know to perform the job. The product of job analysis is a verified list of all duties and tasks performed on the job and the identification of those tasks that must be taught in the formal school/detachment. Once the Job Analysis is complete, an FEA Report is produced and serves as a key input to the Subject Matter Expert (SME) conference held to define the training standards and determine instructional setting.

Job Analysis Requirements

Job analysis begins once a requirement for training has been identified and validated. Job analysis requirements are typically generated by:

1. The introduction of new or better weapons/support systems.
2. Organizational changes such as changes in MOS structure and career field realignments.
3. Doctrinal changes required by new laws, Department of Defense (DoD) requirements, and Marine Corps needs.
4. Evaluations indicating that a change in instruction is required.
5. Direction from higher headquarters.

Task Criteria

A task is a behavior performed on the job. A task is defined by specific criteria and must:

1. Be a logical and necessary unit of work.
2. Be observable and measurable or produce an observable and measurable result.
3. Have one action verb and one object.
4. Be a specific act done for its own sake.
5. Be independent of other actions.
6. Have a specific beginning and ending.
7. Occur over a short period of time.

Duty Areas

To facilitate survey of job incumbents and correlation of survey data, closely related tasks within a task list are grouped by duty area for the purposes of job analysis. A duty area is an organizer of data consisting of one or more tasks performed within one functional area. Duties are generally very broad categories. One or more duties make up a job. A duty may be defined by:

1. a system (e.g., Small Arms Weapons, Mines and Demolitions, Communication Equipment).
2. a function (e.g., Administrative Functions, Patrolling Functions).
3. a level of responsibility (e.g., Train Logistics Personnel, Supervise Intelligence Personnel).

1. Initial Task List Development The first step in Job Analysis is the development of an initial task list and is conducted primarily by TECOM (GTB). This process can include the initial identification of duties or functional areas in which the tasks will be organized. An initial task list is developed by a combination of the following means:

Develop an initial task list.

a. Reviewing technical documentation and references pertaining to the job. This documentation might also be obtained from various sources outside the Marine Corps. These sources may address similar jobs and tasks and have generated materials that may be applicable for task list development. These sources include:

1) Other Service Schools. These include Navy, Army, Air Force, or Coast Guard formal schools, such as U.S. Army Engineer School at Ft. Leonard Wood, MO, U.S. Army Signal School at Ft. Gordon, GA, and Air Force Communications Technical School at Lowry Air Force Base, CO.

2) Trade Organizations/Associations. Civilian or industry trade organization/associations, such as Society for Applied Learning Technology (SALT) or Association of Naval Aviation can provide additional resources and technical support.

3) Defense Technical Information Center (DTIC). DTIC offers training studies, analyses, evaluations, technical articles and publications.

b. Convening a board of subject matter experts (SME) who can detail the requirements of a specific job.

c. Conducting interviews with SMEs.

d. Soliciting input from Marine Corps formal schools/detachments and Centers of Excellence (COE).

Verify the task list for accuracy and completeness.

2. Task List Verification. The next step in Job Analysis involves verifying the task list in terms of accuracy and completeness. Verification ensures that the tasks on the list are actually those performed by members of the OccFld or MOS. Task list verification is normally conducted by TECOM (GTB) during the FEA by one or more of the following methods:

a. Administering survey questionnaires to job incumbents.

b. Conducting interviews with SMEs.

c. Observing actual job performance of tasks at the job site.

d. Convening a board of SMEs to review the task list.

Refine and consolidate the task list.

3. Refining the Task List. After the data in the previous two steps have been collected, the task list is refined and consolidated. A final review of the task list should be made to ensure all tasks meet the criteria for a task discussed previously in this Section.

Identify tasks for formal instruction.

4. Identifying Tasks for Instruction. The final step in job analysis involves identifying specific tasks that may require formal instruction. Some tasks may not be taught because they are relatively simple to perform, are seldom performed, or only minimum job degradation would result if the tasks were not performed. To properly select tasks for instruction, TECOM (GTB) collects data on several criteria relating to each task. This is accomplished through administration of a survey questionnaire sent to job incumbents and SMEs. The data collected represents the judgments of a statistically valid sample of job incumbents and SMEs who are familiar with the job. The responses to the survey are analyzed using statistical analysis procedures. The following criteria may be considered when selecting tasks for instruction and are included in the survey questionnaire administered by TECOM (GTB).

a. 1. Percent of jobholders performing the task.
b. 2. Percentage of time spent performing the task.
c. Criticality of the task to the job.
d. Frequency of task performance.
e. Probability of inadequate performance
f. Task learning difficulty.
g. Time between job entry and task performance (task delay tolerance).
h. Resource constraints at the schoolhouse.

Survey responses to each of these criteria are then analyzed and a Front End Analysis Report (FEAR) is produced that will assist in the task analysis and determination of instructional setting.

1300. TASK ANALYSIS

SECTION 3

The second step in the Analyze Phase is to conduct a Task Analysis that sequences and describes observable, measurable behaviors involved in the performance of a task or job. Task analysis is conducted by a SME conference. It involves the systematic process of identifying specific tasks to be trained, and a detailed analysis of each of those tasks in terms of frequency, difficulty, and importance.

The purpose of task analysis is to:

1. Define the task list based on SME input.
2. Develop ITS/T&R that identify the conditions, standards, and performance steps necessary for the successful completion of a task.
3. Determine where the tasks will be instructed (formal school or via MOJT at the unit level).
4. Produce a target population description that will guide the formal school or unit in the preparation of instruction/training.

Task Analysis identifies specific tasks to be trained, and a detailed analysis of each of those tasks in terms of frequency, difficulty, and importance.

Below are questions to ask when performing a Task Analysis:

1. How difficult or complex is the task?
2. What behaviors are used in the performance of the job?
3. How frequently is the task performed?
4. How critical is the task to the performance of the job?
5. To what degree is the task performed individually, or to what degree is the task part of a set of collective tasks?
6. If a subset of a set of collective tasks, what is the relationship between the various tasks?
7. What is the consequence if the task is performed incorrectly or is not performed at all?
8. To what extent can the task be trained on the job?
9. What level of task proficiency is expected following training?
10. How critical is the task?
11. What information is needed to perform the task? What is the source of information?
12. What are the performance requirements?
13. Does execution of the task require coordination between other personnel or with other tasks?
14. Are the demands (perceptual, cognitive, psychomotor or physical) imposed by the task excessive?
15. How often is the task performed during a specified time-frame (i.e., daily, weekly, monthly, yearly)?
16. How much time is needed to perform this task?
17. What prerequisite skills, knowledge, and abilities are required to perform the task?
18. What are the current criteria for acceptable performance?
19. What are the desired criteria?
20. What behaviors distinguish good performers from poor performers?
21. What behaviors are critical to the performance of the task?

1. Training Standard Development. Once the task list is finalized, performance requirements must be developed for every task selected for instruction. In the Marine Corps, performance requirements for all occupational field specialties (OccFld) are defined by Individual Training Standards (ITS). ITS published in either an ITS Order or a Training and Readiness (T&R) Manual serve as the basis for all individual instruction in units and in formal schools/detachments. Formal schools/ detachments are responsible for teaching the training standards designated for instruction in the formal school. These ITS/T&R events appear as tasks in Appendix B of the Course Descriptive Data (CDD) produced by the formal school (see Chapter 3).

2. Development of ITS/T&R. Once tasks are verified and the task lists are refined, ITS/T&R may be developed. Often, many elements of the ITS (e.g., performance steps, conditions, standards) are collected while the task list is being refined. This enables a better understanding of the task and can serve as a check to ensure the tasks are actually performed on the job. A working group conference composed of subject matter experts (SME) is particularly effective for examining how a task is to be completed by identifying the performance steps and the sequence of those performance steps, conditions, and standards necessary to successfully accomplish the task.

a. **ITS Components**

1) **Task**. The task describes what the job holder must do.
2) **Condition(s).** The conditions set forth the real-world circumstances in which the tasks are to be performed. Conditions describe the equipment and resources needed to perform the task and the assistance, location, safety considerations, etc., that relate to performance of the task.
3) **Standard(s)**. Standards provide the proficiency level expected when the task is performed. Standards can measure a product, a process, or a combination of both. Standards must reflect a description of how well the task must be performed. This standard can cite a technical manual or doctrinal reference (e.g., ...in accordance with FMFM 1-3), or the standard can be defined in terms of completeness, time, and accuracy.
4) **Performance Step(s)**. Performance steps specify the actions required to accomplish a task. Performance steps follow a logical progression.
5) **Reference(s)**. References are doctrinal publications (e.g., technical manuals, field manuals, Marine Corps Orders) that provide guidance in performing the task in accordance with the given conditions and standards. References cited should be current and readily available to the Marine.

6) **Administrative Instructions**. Administrative instructions provide the instructor with special circumstances relating to the ITS, such as simulation requirements and safety or real world limitations, which may be a prerequisite to successful accomplishment of the ITS.

b. **Composition of a T&R Event.** A T&R event contains the following components:

1) **Event Code**. The event code is a three-letter and three-digit designator. The three-letter code is used for grouping events according to their functional area. For collective events, these groupings are derived directly from the community's METs. The three-digit code is used to arrange events in a progressive sequence. The purpose of coding events is to provide Marines with a simplified system for planning, tracking, and recording unit and individual training accomplishments.

   a) **Functional Area Grouping**. Categorizing events with the use of a recognizable three-letter code makes the type of skill or capability being referenced fairly obvious. Examples include DEF (defensive tactics), MAN (maneuver), NBC (nuclear, biological, and chemical), etc.

   b) **Sequencing**. A numerical code is assigned to each training event. The higher the number, the more advanced the capability or skill being evaluated. For example, PAT-201 (patrolling) could be patrolling conducted at the squad level, PAT-240 could be patrolling at the platoon-level, PAT-301 could be patrolling at the battalion level, etc.

2) **Event Description**. The event description is a narrative description of the training event.
3) **Tasks**. A listing of the tasks that are done together to accomplish the training Event. Tasks are defined on page 1.3. There are normally multiple training tasks contained in each event. Tasks may or may not be completed sequentially.
4) **Condition**. Condition refers to the constraints that may affect event performance in a real-world environment. It includes equipment, tools, materials, environmental and safety constraints pertaining to event completion.
5) **Standard**. Standards are the metric for evaluating the effectiveness of the event performance. It identifies the proficiency level for the event performance in terms of accuracy, speed, sequencing, and adherence to procedural guidelines. It establishes the criteria of how well the event is to be performed.
6) **Performance Steps**. Performance steps specify the actions required to accomplish a task. Performance steps follow a logical progression, and should be followed sequentially, unless otherwise stated. Normally, performance steps are listed only for 100-level individual T&R events (those that are taught in the entry-level MOS school), but may be included in upper-level events when appropriate.
7) **Prerequisite(s)**. Prerequisites are the listing of academic training and/or T&R events that must be completed prior to attempting completion of the event.
8) **Reference(s)**. References are the listing of doctrinal or reference publications that may assist the trainees in satisfying the performance standards and the trainer in evaluating the performance of the event.

9) **Ordnance**. Each event will contain a listing of ordnance types and quantities required to complete the event.

10) **External Support Requirements**. Each event will contain a listing of the external support requirements needed for event completion (e.g., range, support aircraft, targets, training devices, other personnel, and non-organic equipment).

11) **Combat Readiness Percentage (CRP)**. The CRP is a numerical value used in calculating training readiness. The CRP value for each event is determined by that event's overall importance within the training syllabus for that unit, occupational specialty, or billet.

12) **Sustainment Interval**. The period, expressed in number of months, between evaluation or retraining requirements to refresh perishable skills and assure readiness. Skills and capabilities acquired through the accomplishment of training events are to be refreshed at pre-determined intervals. Those intervals, known as sustainment intervals, are developed at the respective T&R conference to standardize currency requirements for Marines to maintain proficiency.

3. ITS/T&R Staffing. ITS/T&R staffing involves soliciting comments from affected individuals or organizations throughout the Marine Corps, and then integrating those comments into the ITS/T&R document. The Operating Forces, formal schools/training detachments, and OccFld sponsors (and designated SMEs under special circumstances) will be included on the ITS/T&R staffing distribution list. TECOM (GTB/ATB) will coordinate final review, and will consolidate and reconcile all recommendations.

Upon completion of this process, necessary changes will be incorporated into the final ITS/T&R draft Order for signature. ITS/T&R Manuals are forwarded to CG, TECOM for approval and signature.

Once final approval and signature has been received, the training standards are published as either a T&R Manual in the MCO 3500-series, or as an ITS Order in the MCO 1510-series, and can then be distributed throughout the Marine Corps.

1400. INSTRUCTIONAL SETTING

SECTION 4

The third process in the Analyze Phase involves determining the instructional setting for each individual training standard (ITS) task behavior. Instructional setting is important because it defines who is responsible for instructing the task and the level of proficiency the student must achieve when performing the task in an instructional environment. TECOM is responsible for determining the organization responsible for conducting the instruction and the level of instruction assigned to each task. This is done during the SME Conference while ITS/T&R events are being developed. When determining instructional setting, two guiding factors must be used -- effectiveness and efficiency. The Marine Corps seeks the best training possible within acceptable, affordable costs while meeting the learning requirement.

1. Responsibility for Instruction. Once the job is defined and the ITS/T&R events are developed, the job structure can be broken down into organizations that will assume responsibility for instruction. The tasks must be divided into four groups:

a. Those that are to be included in a formal learning program.
b. Those that are to be included in a Managed On-the-Job-Training (OJT) program.
c. Those that can be covered via computer-based instruction or via simulation.
d. Those for which no formal or OJT is needed (i.e., can be learned by using job performance aids or self study packets).

2. Instructional Setting. The purpose of entry level formal school instruction is twofold: to teach the minimum skills necessary to make the Marine productive immediately upon arrival at his first duty station; and to provide the Marine with the necessary prerequisites to continue instruction in an MOJT program. Instructional setting refers to the extent of instruction assigned to each Individual Training Standard (ITS) task behavior. Instructional setting is generally determined by convening a board of job incumbents and SMEs to discuss the extent of instruction required to adequately perform the task. Instructional settings are published in the T&R Manual or ITS Order. Instructional settings in T&R Manuals are prescribed only for entry-level training by listing them as 100-level events. Enclosure (3) of the ITS System (MCO 1510-series) prescribes instructional settings in the following manner:

a. Tasks taught to standard are indicated by an “S” in the FS/MOJT column.
b. Tasks taught as preliminary or introductory in the formal school setting are depicted with a “P” in the FS/MOJT column. These tasks require follow-on instruction at the unit through MOJT for the Marine to achieve the standard of proficiency required.
c. Tasks that are not taught at the formal school have no designator in the FS/MOJT column.

SECTION 5

1500. REQUIREMENTS AND RESPONSIBILITIES IN THE ANALYZE PHASE

1. Training and Education Command [TECOM (GTB/ATB)] Responsibilities. A systematic approach to the design of instruction requires an identification of the tasks performed on the job. Job performance in the Marine Corps is defined and supported by training standards. Training standards published in ITS orders or as individual events in T&R Manuals are the primary source for the development of all Marine Corps instruction. TECOM (GTB/ATB) is responsible for coordinating all the steps in the Analyze Phase and for managing the FEA process. TECOM will coordinate the development of ITS/T&R for military occupational fields (OccFld) and military occupational specialties (MOS). The culmination of the Analyze Phase is an approved set of training standards for an OccFld or MOS, published as a Marine Corps Order (MCO) in the 1510 or 3500 series.

a. **Job Analysis.** As part of the FEA process, TECOM (GTB) is responsible for conducting job analyses. Additionally, TECOM (GTB) will collect supporting information that will assist in the identification and selection of tasks for instruction. TECOM (GTB) publishes the analysis results in a Front-End Analysis Report (FEAR).

b. **Task Analysis**. TECOM (GTB/ATB) is responsible for convening the SME conference. The conference conducts formal task analysis and produces the refined task list.

c. **Determination of Instructional Setting**. The SME conference also determines where the tasks should be taught, either at the formal school/detachment, or in the operating forces/supporting establishment. The TECOM task analyst conducting the SME conference will publish the instructional setting in the T&R Manual or ITS Order.

2. Formal School/Detachment Responsibilities. The formal schools play important roles during the Analyze Phase.

a. **Job Analysis**. The formal school/detachment advises the task analyst within TECOM (GTB/ATB) on the construction of task lists that will be used to build FEA questionnaires. The school also sends key personnel to the SME conference who can make decisions on behalf of the commander. Formal school personnel actively participate in the final step of Job Analysis – selection of the tasks for instruction -- by making recommendations on whether or not the task can be properly taught at the school. When the requirements of the task exceed current resources, the SMEs make recommendations for additional resources.

b. **Task Analysis**. Since task analysis involves determining the condition, standard, performance steps, etc., having the resident experts from the formal school participate in this process is critical.

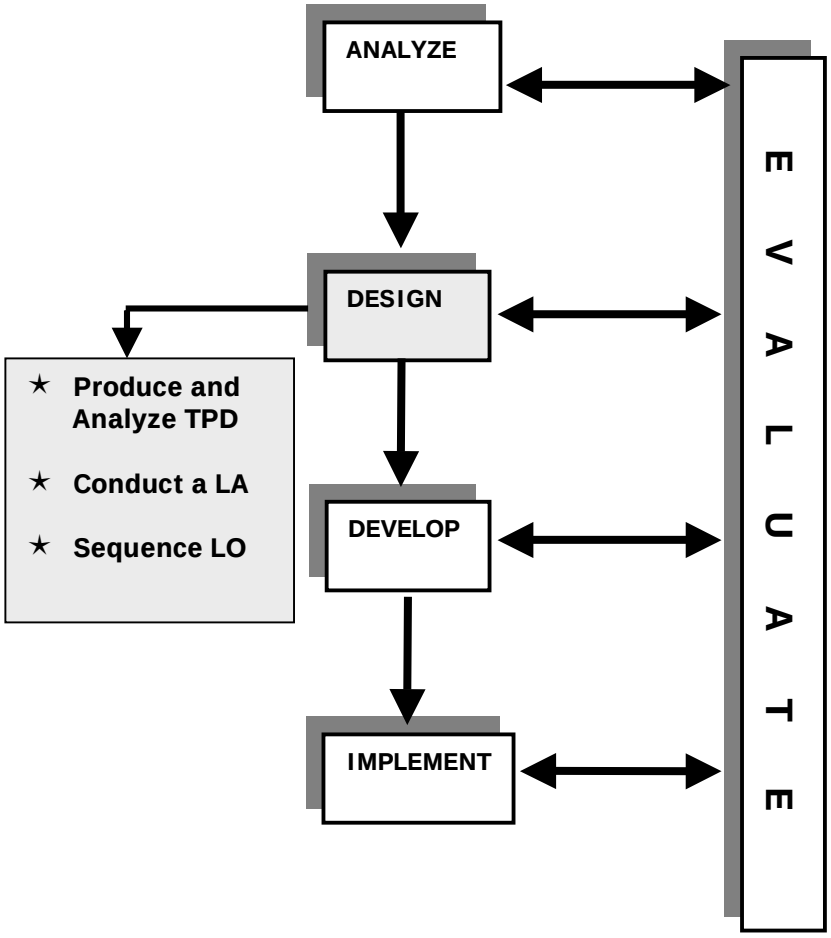
c. **Determination of Instructional Setting.** The determination of where the tasks should be taught, either at the formal school/detachment, as part of a web-based course, or as part of an MOJT program in the operating forces is essential. Formal school/detachment personnel provide key inputs to this step during the SME conference.

The Determination of the Instructional Setting is the final process in the Analyze Phase. The output of this phase is:

- **Individual Training Standards (ITS) Order or Training and Readiness (T&R) Manual.**

This output becomes the input to the Develop Phase. The first step of the Design Phase will be to write a Target Population Description (TPD) for the course to be developed from the events/ITS identified during the Analyze Phase.

DESIGN PHASE



In Chapter 2:

Chapter 2

2000. INTRODUCTION

The outputs of the Analysis Phase, the ITS Order or the T&R Manual, become the inputs to the Design Phase. During the Design Phase, the curriculum developer takes the ITS Tasks or T&R events designated to be taught at the formal school/detachment, and attempts to simulate, as closely as possible, the real-world job conditions within the instructional environment. The closer the instruction is to real world job requirements, the more likely it is that the student will transfer the learning to the job.

Formal School/ Detachment is any MOS or professional development school in the Marine Corps.

The Design Phase consists of these three processes:

1. **Write the Target Population Description (TPD):** "Who is coming for instruction and what knowledge, skills, and attitudes (KSAs) must/will they bring with them?"

2. **Conduct a Learning Analysis:** "What do I have to teach with?" and "What will be taught, evaluated, and how?"

3. **Sequence TLOs**: "In what order will the instruction be taught to maximize both resources and the transfer of learning?"

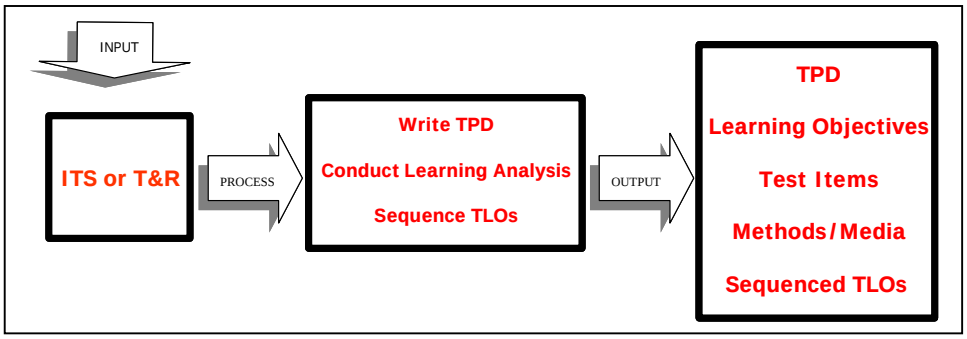


Figure 2-1

2100. WRITE THE TARGET POPULATION DESCRIPTION

SECTION 1

INTRODUCTION The first process of the Design Phase is to write the **Target Population Description (TPD)**. A TPD is a description of the knowledge, skills, and attitudes (KSAs) students are expected to bring to a course of instruction. It provides a general description of an average student and establishes the minimum administrative, physical, and academic prerequisites they must possess prior to attending a course. During the Design Phase, the TPD will provide guidance for developing objectives and selecting instructional strategies that will meet the needs of the students.

KSA - Knowledge, skills, and attitudes.

2101. ROLE OF TPD IN INSTRUCTION

The TPD provides the focus for designing instruction. For instruction to be effective and efficient, it must build upon what students already know. Considering the TPD allows the curriculum developer to focus on those specific knowledge and skills a student must develop. For example, if knowing the nomenclature of the service rifle is required for the job, and the students entering the course already possess this knowledge, then teaching this specific information is not required. Conversely, if students entering a course do not know the service rifle nomenclature, then they need instruction. The TPD also allows the curriculum developer to select appropriate methods of instruction, media, and evaluation methods. For example, experienced students can often learn with group projects or case studies and self-evaluation. Entry-level students generally need instructor-led training and formal evaluation. In summary, the TPD describes the average student in general terms, establishes prerequisites, serves as the source document for developing course description and content, and is used to design instruction.

TPD - Target Population Description

2102. STEPS IN WRITING THE TPD

1. Obtain Sources of Data To clearly define the target population, gather data from the appropriate sources listed below. These references outline job performance by detailing what tasks must be performed on the job and the specific requirements of that particular job.

a. MCO P1200.7_, Military Occupational Specialty (MOS) Manual.

b. Marine Corps Order (MCO) P3500 Series, Training and Readiness (T&R).

c. Marine Corps Order (MCO) 1510 Series, Individual Training Standards (ITS).

Additionally, information can be obtained from the OccFld Sponsor and Task Analysts (GTB) by means of phone conversation and/or electronic message.

Gather Data

STEP 2

2. Gather and Review Student Background Information While considering the adult learning characteristics identified in Chapter 6 and the resources identified above, review pertinent student background information. In order to ensure the course prerequisites are correct and that the training program is developed to meet the attributes of the TPD, organize this information into the following categories:

1. **Administrative**
2. **Physical**
3. **Academic**

a. **Administrative** Certain prerequisites may be necessary due to administrative requirements of the school or the course material. These prerequisites include the student's rank, MOS, security clearance, time remaining in service, or police record (which may mean exclusion from certain types of instruction).

b. **Physical** Physical information includes specific skills and general fitness which may include age, height, color perception, vision acuity, physical limitations, etc.

c. **Academic** Academic information represents an inventory of the knowledge and skills the student must or will possess prior to the start of instruction. These prerequisites may include specific basic courses already completed, reading level, test scores, training experience and GCT/ASVAB scores.

STEP 3

3. Write the TPD Capture information that describes the general characteristics of the average student attending the course. Summarize the data into a concise paragraph describing the target population. Organize the general information describing the average student so that it is grouped together and any prerequisites are grouped together.

TPD FOR CURRICULUM DEVELOPER COURSE

This course is designed for Sergeant through Lieutenant Colonel and civilian employees who perform curriculum development duties at a Marine Formal School or Detachment. Prior to being enrolled in this course, students are required to complete the Systems Approach to Training Interactive Multimedia Instruction (IMI), and the Operational Risk Management IMI. Most students attending the course have experience as an instructor at a Formal School or Detachment, are able to use Microsoft Word and PowerPoint, and possess effective written communication skills.

Figure 2-2. Sample Target Population Description (TPD)

2200. CONDUCT A LEARNING ANALYSIS

The second process of the Design Phase is to conduct a Learning Analysis to define what will be taught. The purpose of the Learning Analysis is to examine the real world behavior that the Marine performs in the Operating Forces and transform it into the instructional environment. A Learning Analysis produces three primary products essential to any Program of Instruction (POI): learning objectives, test items, and methods/media. This process allows for adjustments to be made to accommodate for resource constraints at the formal school/detachment. A Learning Analysis must be performed for every task covered in new courses. Additionally, each new task added to either the Individual Training Standard (ITS) Order or Training and Readiness (T&R) Manual, and taught at the formal school, requires a Learning Analysis.

POI- Program of Instruction.

3 primary products of a Learning Analysis:

1. Learning Objectives
2. Test items
3. Methods/Media

2201. STEPS TO CONDUCT A LEARNING ANALYSIS

1. Gather Materials The first step in conducting a Learning Analysis is to gather materials. Once the scope of the course that the curriculum developer is designing is determined (by reading guidance from TECOM or the school commander), obtain the:

STEP 1

a. ITS order or T&R manual – to determine what tasks the jobholder performs.

b. Publications – like orders, directives, manuals, job aids, etc. that will help analyze the tasks to be taught.

c. Subject Matter Experts – to fill in details that the publications will not. SMEs will conduct the brainstorming session along with the curriculum developer.

d. Learning Analysis Worksheet (LAW) - Use the LAW found in the SAT Manual, enlarge it to turn-chart size, or create one on a dry erase board (take a digital photo to record results). It does not matter which technique is chosen, as long as a record of the analysis is created.

e. Previously developed LAWs and LOWs for established courses under review.

Figure 2-3 is an extract from an ITS task list. Figure 2-4 is an ITS and component description. Figure 2-5 is an extract of a T&R event and component description.

See Figures 2-3, 2-4, and 2-5 on the next several pages.

Figure 2-3 ITS Task List Extract

SUMMARY/INDEX OF INDIVIDUAL TRAINING STANDARDS

1. **General** This enclosure contains a summary listing of all of the ITS tasks grouped by MOS and Duty Area.

2. **Format** The columns are as follows:

   a. **SEQ** Sequence Number. This number dictates the order in which tasks for a given duty area are displayed.

   b. **TASK** ITS Designator. This is the permanent designator assigned to the task when it is created.

   c. **TITLE** ITS Task Title.

   d. **CORE** An "X" appears in this column when the task is designated as a "core" task required to earn the title United States Marine and Basic Rifleman.

   e. **FS/D** Formal School/Detachment. An "X" is in this column when the FS/D is designated as the initial training setting.

   f. **PST** Performance Support Tool. An "X" in this column indicates that at least one PST is associated with this task. Consult enclosure (6) for details.

   g. **DL** Distance Learning Product. An "X" in this column indicates that at least one DL product is associated with this task. Consult enclosure (6) for details.

   h. **SUS** Sustainment Training Period. An entry in this column represents the number of months within which the unit is expected to train or retrain this task to standard provided the task supports the unit's METL.

   i. **REQ BY** Required By. An entry in this column depicts the lowest rank required to demonstrate proficiency in this task.

   j. **PAGE** Page Number. This column lists the number of the page in enclosure (6) that contains detailed information concerning this task.

SEQ	TASK #	TITLE	CORE	FS/D	PST	DL	SUS	REQ BY	PAGE
		MOS , MCCS, Marine Corps Common Skills							
DUTY AREA 11 –		INDIVIDUAL WEAPONS (IMCCS)							
1)	MCCS.11.01	PERFORM WEAPONS HANDLING WITH M16.....X		X			12	Pvt	6-A-38
2)	MCCS.11.02	MAINTAIN THE M16A2 SERVICE RIFLE	X	X			12	Pvt	6-A-38
3)	MCCS.11.03	ENGAGE TARGETS WITH THE M16A2 SERVICE RIFLE AT THE SUSTAINED RATE	X	X			12	Pvt	6-A-39

TASK: MCCS.11.02 (CORE). **MAINTAIN THE M16A2 SERVICE RIFLE**

CONDITION(S): Given an M16A2 Service Rifle, cleaning gear and lubricants,

STANDARD: To meet serviceability standards per the TM

PERFORMANCE STEPS:

1. Handle the weapon safely.
2. Place the rifle in Condition 4.
3. Disassemble the rifle.
4. Clean the rifle.
5. Lubricate the rifle.
6. Reassemble the rifle.
7. Perform function check.

INITITAL TRAINING SETTING: FS/D Sustainment (12) Req By (Pvt)

REFERENCE(S):

1. MCRP 3-01A, Rifle Marksmanship
2 TM 05538C-10/1A, Operator's Manual for Rifle, 5.56mm M16A2 W/E.

ADMINISTRATIVE INSTRUCTIONS: NONE

FIGURE 2-4 Individual Training Standard

Individual Training Standards Component Description

1. **General** ITS's contain six components: task, condition(s), standard(s), performance steps, reference(s), and administrative instructions.

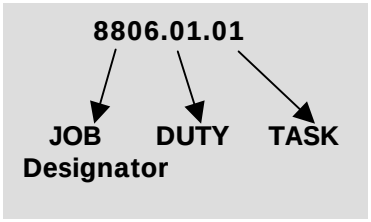
2. **Alphanumeric System** Each ITS is identified by a designator consisting, in order, of four alphanumeric characters: a period, two numbers, a period and two additional numbers.

a. The first four characters identify the job and should be the same as the MOS if one exists. For the instructor, the job designator is 8806.

b. The two Arabic numerals following the first period represent a DUTY area of the JOB. The designator for the first DUTY area under JOB 8806 is 8806.01.

c. The last two Arabic numerals within the designator represent a task within the DUTY area. The first TASK under the first DUTY area of JOB 8806 is identified as 8806.01.01. The second TASK under the third DUTY area of JOB 8806 is designated as 8806.03.02, and so forth.

FIGURE 2-4 (CONT) Components Description of an Individual training Standard.



3. **ITS Components**

a. **Task** The task describes what a Marine has to do. It is a clearly stated, performance-oriented action requiring learned skills and knowledge. A rank (grade) is noted for each task. This rank is the grade at which the Marine must be able to perform that task to standard.

FIGURE 2-4 (CONT) Components Description of an Individual Training Standard.

b. **Condition(s)** The conditions set forth the real world or wartime circumstances under which the tasks are to be performed. This element of an ITS underscores "realism" in training. When resources or safety requirements limit the conditions, this should be stated in Administrative Instructions. It is important to understand that the conditions set forth in this Order are the minimum and may be adjusted when applicable.

c. **Standard(s)** A standard states exactly the proficiency level to which the task will be performed. It is not guidance, but a very carefully worded statement, which sets the proficiency level required when the task is performed. The standard is the established acceptable level of task performance under the prescribed conditions.

d. **Performance Steps** There must be at least two performance steps for each task. Performance steps specify actions required to fulfill the proficiency established by the standard. These performance steps indicate a logical sequence of collective actions required to accomplish the standard.

e. **Reference(s)** Reference(s) are directives and doctrinal/technical publications that specify, support, or clarify the performance steps. References should be publications that are readily available.

f. **Administrative Instructions** Administrative instructions provide the trainer/instructor with special circumstances relating to the ITS such as safety or real world limitations which may be a prerequisite to successful accomplishment of the ITS.

g. **Initial Training Setting** All ITS's are assigned an Initial Training Setting that includes a specific location for initial instruction [Formal School (FS) or Operating Forces], level of training required at that location (Core/Core-Plus/MOJT), a sustainment factor (number of months between evaluation or retraining to maintain the proficiency required by the standard), and a “Required By” rank (the lowest rank at which task proficiency is required).

h. **Training Material (Optional)** Training materiel includes all training devices, simulators, aids, equipment, and materials [except ammunition and Marine Corps Institute (MCI) publications] required or recommended to properly train the task under the specified condition and to the specific standard. Mandatory items are preceded with an asterisk (*).

i. **Ammunition (Optional)** This table, if present, depicts ammunition, explosives, and/or pyrotechnics required for proper training of the ITS.

j. **Current MCI(s) (Optional)** This section includes a list of any currently available MCI publications designed to provide training related to this task.

Figure 2-5 Components of a T&R Event

Event	Description	Sust Int
57XX-OPS-1010	Conduct operations in a chemically contaminated environment	3 mths

Tasks:
1. Prepare for NBC operations.
2. Prepare for chemical attack.
3. React to chemical attack.
4. Prepare to cross a chemically contaminated area.
5. Cross a chemically contaminated area.
6. Decontaminate individual Marines.
7. Conduct hasty equipment decontamination.
8. Conduct MOOP gear exchange.

Condition: Under any terrain and weather condition, given normal individual and unit combat equipment.

Standard: All personnel don MOPP gear and be ready to continue unit movement, combat support or combat service support within 10 minutes of the alarm. Perform operation in MOPP gear for a minimum of 30 minutes. Decontaminate all personnel and equipment within 2 hours.

Performance Steps: N/A

References: MCO 3400.3, FMFM 11-1, FMFM 11-10, FMFM 11-9

Ordnance: N/A

External Support: Movement range appropriate for unit size.

Training and Readiness Event Component Description

1. **General** An event contained within a T&R Manual is an individual or collective training standard and contains the following components.

a. **Event Code** The event code is a 4-letter alpha and/or numeric MOS designator followed by an up to 4-letter alpha and/or numeric functional area designator followed by a 4-letter numeric sequence designator. The purpose of coding events is to provide Marines with a simplified system for planning, tracking, and recording individual and unit training accomplishments. Grouping and sequencing individual skills and unit capabilities build a "picture" for the user showing the progression of training.

***Grouping*:** The code is used for grouping events according to their functional area. Categorizing events with the use of a recognizable up to 4-letter code makes the type of skill or capability being referenced fairly obvious. Examples include DEF (defensive tactics), MAN (maneuver), NBC (nuclear, biological, and chemical), RAD (Radar), etc.

***Sequencing*:** The 4-digit code is used to arrange events in a progressive sequence.

FIGURE 2-5 (CONT) Component Descriptions of a Training and Readiness Event.

FIGURE 2-5 (CONT) Components Descriptions of a Training and Readiness Event.

b. **Event Description** Narrative description of the training event.

c. **Tasks** A listing of the component parts of the T&R Event. Tasks are usually a unit of work usually performed over a finite period of time that has a specific beginning and end can be measured, and is a logical, necessary unit of performance. In the T&R Program, a unit of work may actually be a T&R Event, and may reappear in a higher-level event as a component part – a Task. There is often more than one task for each training event. A 100-level Event (to be taught at the formal school) consists of a single task that is the Event Description and will not normally have a listing of Tasks as shown here. A 100-level event will often have multiple performance steps, although they may not be listed in the T&R Manual if an event's reference contains the necessary performance steps.

d. **Condition** Condition refers to the constraints that may affect task performance in a real-world environment. It includes equipment, tools, materials, environmental and safety constraints pertaining to the task completion.

e. **Standard** Standards are the metrics for evaluating the effectiveness of the event performance. It identifies the proficiency level for the event performance in terms of accuracy, speed, sequencing, and adherence to procedural guidelines. It establishes the criteria of how well the event is to be performed. It is not guidance; it states exactly the proficiency level to which the task will be performed. Whenever possible, the standard should cite a reference that defines the tasks in procedural or operational terms.

f. **Performance Steps** Performance steps specify the actions required to accomplish a task. Performance steps follow a logical progression and should be followed sequentially, unless otherwise stated. Normally, performance steps are listed only for 1000-level individual events (those that are taught in the formal MOS school). Listing performance steps is optional for 2000-level events and above.

g. **Prerequisite(s)** Prerequisites are the listing of academic training and/or T&R events that must be completed prior to attempting completion of the event.

h. **Reference(s)** References are the listing of doctrinal or reference publications that may assist the trainee in satisfying the performance standards and the trainer in evaluating the performance of the event.

i. **Ordnance** Each event will contain a listing of ordnance types and quantities required to complete the task.

j. **External Support Requirements** Each event will contain a listing of the external support requirements needed for event completion (e.g., range, support aircraft, targets, training devices, other personnel, and non-organic equipment).

k. **Combat Readiness Percentage (CRP)** The CRP is a quantitative numerical value used in calculating individual and collective training readiness. The CRP of each event is determined by its relative importance to other events.

l. **Sustainment Interval** The number of months between evaluation or retraining by the individual or collective event in order to maintain proficiency.

2. Determine Training Requirements Review the ITS order or T&R manual to determine what tasks must be taught at the formal school/detachment.

a. For an ITS order, refer to enclosure three. Those tasks designated for instruction at a formal school will have alpha indicator in the column labeled "FS". This information is also spelled out for each task in Appendix A to Enclosure 6 of the ITS order.

STEP 2

b. In a T&R manual, all tasks taught at the formal school for initial, individual MOS training are listed at the 1000-level. For MOS progression training conducted at the formal school, select events are identified in the manual.

In some cases, topics that need to be taught at a formal school/detachment will not have corresponding tasks in the ITS order or T&R manual. To teach these topics in a formal school/detachment, one of two courses of action must be followed. The first course of action is to designate the lesson as "Lesson Purpose"; it will not have learning objectives. Examples are a course overview or an introduction to a series of tasks being instructed. Lesson purpose classes must be kept to a minimum, because they use school resources (like time) without directly supporting a given task. The other course of action is to contact the task analyst at TECOM for further guidance. It is possible that the ITS order or T&R manual needs a task added to it, and the analyst can provide authority to teach until the revision is made.

3. Analyze the Target Population Description Before the knowledge, skills, and attitudes (KSAs) are determined, the target population must be analyzed. The TPD is analyzed so that the curriculum developer can make a determination of the KSAs the students will bring into the instructional environment. Instruction must capitalize on students' strengths and focus on those KSAs the students must develop or possess to perform satisfactorily on the job. The goal is for the learning analysis to reveal the instructional needs of the target population so that selected methods and media are appropriate for the student audience .

STEP 3

4. Record Task Data Record the data found in the ITS order or T&R manual. The LAW in Appendix A serves as a guide for what information to record. Record the T&R Event or ITS Duty Description, T&R Event or ITS Duty Code, the task, task code, and the conditions and standards associated with the task. Then record each performance step. A good strategy to stay organized and focused is to only record one performance step per page. It is also a good idea to fill out all LAWs required for a learning analysis prior to beginning step 5.

STEP 4

5. Generate Knowledge, Skills, and Attitudes for each Performance Step When generating knowledge, skills, and attitudes (KSA), analyze each performance step and break it down into a list of KSAs required for each student to perform that performance step. Consideration of the level of detail needed, transfer of learning, target population, and school resources is essential. The method used to identify KSAs is commonly called "brainstorming."

STEP 5

Brainstorming is the process used for SMEs and curriculum developers to work together to ensure that KSAs are generated for each performance step. In order to do this, the differences between knowledge, skill, and attitude must be identified:

KSA – Knowledge, Skill, Attitude.

a. **Knowledge** is information required to effectively accomplish a step, task, or job. Knowledge involves storing and recalling information and refers to the learning of names, facts, processes, and principles. Examples include "know rifle nomenclature"; "know the format of the operations order"; "know the components of a NSN" etc.

b. **Skill** is the ability to perform an activity that contributes to the accomplishment of the step, task, event, or job. Examples include "be able to disassemble a rifle"; "be able to organize inventory" etc.

c. **Attitude** is the feeling or emotion in regard to a fact or state. Since the majority of these cannot be observed or measured within the confines of the instructional setting, they are generally not recorded during the Learning Analysis. The exception is when analyzing the lower levels of receiving and responding within the affective domain. (See Chapter 6, Section 6502).

Knowledge and skills are generated from references for the subject or task, such as an operator's manual, SOP, user's guide, and so forth. Also, consider the knowledge and skills that the target population possesses upon entering the course. This will ensure that resources are not wasted on instruction of knowledge and skills that the target population already possesses.

KSAs are brainstormed and recorded with one object and one verb.

KSAs are brainstormed and recorded with one object and one verb, the words "or" and "and" cannot be used as they would introduce a second object or verb.

A knowledge or skill must be recorded for each performance step to indicate that the step has been analyzed and not overlooked. If no knowledge or skill can be generated for the performance step, then record the performance step as the knowledge or skill. These KSAs are an essential part of lesson plan development, as they will become the information contained in the lesson plan.

6. Group KSAs Review all the knowledge and skills generated for the entire task/event, regardless of the performance step under which they were initially brainstormed. Circle and/or color-code the ones that are duplicative, very similar, or common to one or more performance steps. For each group, answer the question: "What behavior would confirm that the student possesses these skills and knowledge?" Complementary knowledge and skills are grouped to reduce the number of Enabling Learning Objectives (ELO). ***Therefore the number of performance steps does not necessarily equate to the number of ELOs.*** Record behaviors on a working copy/scratch paper and retain since these behaviors are the basis for developing the ELOs. Also, use the scratch paper for notes and other considerations or decisions that are made.

ELO - Enabling Learning Objective.

The number of performance steps does not necessarily equate to the number of ELOs.

Specifically, grouped knowledge and/or skills that are beyond the scope of instruction (for more experienced personnel) or are possibly taught elsewhere (in the course or school), still need to be grouped and recorded as the Learning Analysis progresses. For example, if any grouped KSAs identified during the Learning Analysis directly relate to the TPD of the course, they would be designated as "TPD." Additionally, if a grouped KSA were taught in an earlier

TLO- TLO. The TLO has already been identified by the task (ITS) or event (T&R)

portion of the course, then it would not need to be re-taught but merely recalled. These grouped KSAs will be designate as delete "del" since they will not be taught in follow-on lessons. However, since these KSAs were identified during the Learning Analysis, they must be recorded for every task. This is critical to ensure that when future modifications to the course are made, key KSA groupings are not lost or dropped from the instruction.

7. Sequence Groupings Review the draft behavior for each individual task/event and all the groupings of knowledge, skills and/or attitudes. The question to be answered during this step is, "Which grouping(s) of knowledge, skills, and/or attitudes should be taught first?" There are several methods curriculum developers use to sequence and present course material. The developer will use one, or a combination of two or more, of the methods listed below to sequence the groupings.

a. **Whole to Part** Present the result or product first, and then present the process or each step.

b. **Part to Whole** Present the process or steps first, then teach the final result or product.

c. **Simple-to-Complex** Present concepts that students may be familiar with or that are less complicated, then build on these concepts by presenting newer or more difficult ones.

d. **Complex-to-Simple** Actions are sequenced in terms of decreasing complexity; each associated with the larger complex structure of which it is a part.

e. **Chronological** Present concepts or ideas in the order they occur over time, such as with historical events.

f. **Sequential** Present procedures or steps in the order they are performed on the job.

g. **Cause and Effect order** Actions are sequenced to demonstrate cause and affect relationships. This technique is appropriate for relationships that personnel must commit to long-term memory and for which training environment performance failures can be tolerated.

h. **Critical Order** Actions are sequenced in the order of relative importance, whether from the least important to the most or vice versa, depending on the situation. Tasks favoring this technique are those that require an important action such as "Clear the weapon before starting disassembly."

Methods used to sequence and present material.

i. **Known-to-Unknown Order** Familiar topics are considered before unfamiliar ones. This technique is appropriate in situations where the target audience has some familiarity with the type of action, but the specific action is generally unknown to them. For example, maintenance of military commercial vehicles would precede maintenance of lesser-known military specific vehicles.

Assign a lower case alpha designator to each grouping of KSAs, based on the order that they will be taught.

Under each performance step, assign a lower case alpha designator to each grouping of KSAs, based on the order that they will be taught. For the first group the lower case "a" would be assigned, "b" for the next and so on. If the groupings exceed a to z, continue with aa, ab, ac, etc…

8. Record Learning Analysis in MCAIMS MCAIMS is the designated database that the Marine Corps uses for managing instruction. For documentation of the Learning Analysis process, all elements must be recorded into MCAIMS. Refer to MCAIMS User Manual for MCAIMS instructions. A Learning Analysis Worksheet (LAW) must be produced for inclusion in the Master Lesson File (MLF). The LAW used in the MLF may either be paper-based and/or the MCAIMS version. The required components of an MLF are discussed in Section 3800 of this manual. See Appendix A for the paper-based LAW and Appendix C for the Learning Analysis checklist.

2202. DEVELOP LEARNING OBJECTIVES

The learning objective is the first of three primary products of the Learning Analysis. A learning objective is defined as the precise behavior that the student will accomplish under a specified condition, and to a prescribed standard. It is a "contract" between the instructor and the student.

The purpose of a learning objective can be broken down into five areas. All areas should be considered of equal importance. The learning objective should:

What a Learning Objective should do!

1. Tells student what he/she will be able to perform. (Behavior)
2. Describes the conditions under which the performance will occur. (Condition)
3. Tells how well someone will perform. (Standard)
4. Establishes the basis for measurement of the performance.
5. Provides a focus for the instructor and the student.

2203. COMPONENTS OF A LEARNING OBJECTIVE

Prior to writing a learning objective, it is important to have an understanding of each component: behavior, condition, and standard.

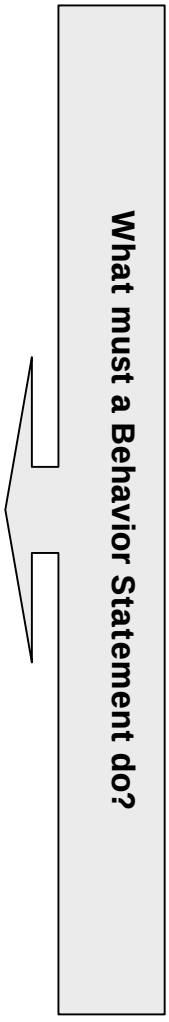
1. Behavior The behavior is the action the student is expected to perform after instruction. The behavior must:

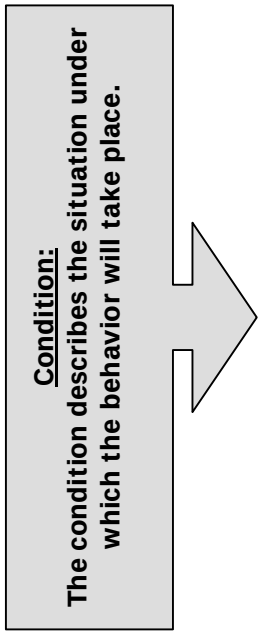
a. **Contain one action verb and one object** To avoid confusion by both the student and the instructor, the behavior needs to state a single action and a single object. For example, "type an electronic mail message."" In this example "type" is the action verb, and "message" is the object.

b. **Be free of ambiguity** When a behavior is observable, measurable, and uses qualifiers when necessary, the behavior will mean the same thing to all students. An action verb must be observable in order to be measurable. It should paint a picture in the student's mind of what must be accomplished. This is true whether it is knowledge or a skill. Some verbs require further explanation. For instance, the verb "describe" requires a qualifier, either "in writing" or "orally." This will eliminate any confusion on the part of the student as to how he will be required to demonstrate the behavior. Examples of other verbs that require qualifiers are "explain," "select," and "list." By qualifying the action statement, the action or the product of that action is made observable. Some verbs are not useful even when qualified. These verbs are impossible to directly observe. For example, a person cannot see someone "know." A person cannot see someone "understand." These words are intangibles. Other verbs that are not useful are known as constructs. A construct is something that exists only in the mind. Love and hate are constructs. We cannot see, hear, taste, smell, or feel love and hate, at least not in the physical sense, even though we know they exist. (See figure 2-7 for a comprehensive domain/verb listing)

c. **Be stated in student terms** Instructors must understand that they already possess knowledge that the student does not. Do not use acronyms or technical terms that could create confusion. Keep it simple, clear, and concise.

d. **Be a realistic performance of the behavior in the instructional environment** The behavior must reflect what the student will do within the confines of the instructional environment and should closely as possible replicate what the student will do on the job.





2. Condition The condition describes the situation under which the behavior will take place. Conditions specify the resources provided to the student and the environment in which the student must perform the behavior. The formal school/detachment must attempt to duplicate the condition identified in the learning objective. Conditions can be broken down into three areas: aiding/limiting, environmental, and implied.

a. **Aiding/Limiting Conditions** A description of what a student will or will not have available to him/her when performing the task. These include references, tools, equipment, job aids, facts, formulas, specific situations, special instructions, and cues. If the task must be simulated because performance could be hazardous or impracticable to reproduce, then the conditions must reflect this simulation. For example, "in a simulated contaminated environment."

(1) **Aiding Conditions** Any information or resource that is available to the student is considered an aiding condition. Some examples are listed below:

Aiding Conditions Examples

***With the aid of references*, draft a letter in accordance with the references.**

***Given tools and equipment*, tune an engine in accordance with the references.**

***Given a observation scenario...*, complete a "SALUTE" report in accordance with the references.**

(2) **Limiting Conditions** Any information or resource that is not available to the student is considered a limiting condition. Some examples are listed below:

Limiting Conditions Examples

***Without the aid of references*, perform immediate action in accordance with the references.**

***While blindfolded*, assemble an M16A2 rifle in accordance with references.**

b. **Environmental Conditions** Environmental conditions describe the environment in which the student will be performing the behavior. These conditions can be physical or social.

(1) **Physical** Physical conditions deal with the time of day, weather, location, and facilities. A few examples are listed on the next page.

***During the hours of darkness*, navigate from point A to point B in accordance with the references.**

Drive a HMMWV *in mountainous terrain* per the reference.

***Given a mess galley*, bake a cake according to recipe.**

Physical Environmental Condition Examples

(2) **Social** Most learning objectives talk to the student as an individual but they may also identify the student as a member of a team. For example, "*as a member of a machine gun team..."* This is an important aspect of the social environment since the person performing the behavior could be affected by what the other team members do or fail to do.

c. **Implied conditions** Quite often the verb or object in a learning objective will have an implied condition in it. The learning objective, "Without references, drive an LAV over rough, hilly terrain in accordance with the Rough Terrain Checklist," has an implied condition. It implies that the driver will have an LAV, and anything else required to operate it over rough, hilly terrain. For tasks that require the Marine to be equipped with individual equipment, all efforts need to be made to simplify the condition statement with regard to these items. Instead of listing each piece of gear that the Marine would wear, a generic statement such as, "while wearing a combat load" needs to be used. Clarification of those components that make up a combat load is provided during the lesson or in a reference.

3. **Standard** The standard describes the level of proficiency to which the behavior must be performed. Standards state the quantity and/or quality of acceptable behavior. There are four criteria for a good standard:

To be a standard, these four criteria must be met:
Completeness, Accuracy, Time, and Realistic.

a. **Completeness** A standard specifies the level of task completion that indicates acceptable performance of the task behavior. For instance, a standard may specify the precise nature of the output, the number of features that the output must contain, the number of steps, points, pieces, etc., that must be covered or produced, or any quantitative statement that indicates an acceptable portion of the total.

For example:

List, in writing, 3 of the 5 performance steps per the instructions.

Orally state in sequence the 11 general orders in accordance with the reference.

Provided tools and equipment, tune up an engine so that the engine idles at the proper RPM per the reference.

b. **Accuracy** A standard indicates what is considered an accurate performance of a task behavior. Standards specify how well the behavior must be performed and are normally contained in references such as Marine Corps Orders, Technical Manuals, and Field Manuals. Only those references that describe in detail an acceptable standard of performance may be cited. If parts of the standard are contained in more than one reference, all references must be cited.

For example:

Given a formula, solve a mathematical problem *to within two decimal points.*

Provided a range and ammunition, fire the rifle (annual rifle requalification) *with a minimum score of 25*.

Given an information worksheet, complete form DD 295 *in accordance with the reference.*

c. **Time** If the task is time critical, then the minimum time requirement must be specified in terms of days, hours, minutes, or seconds.

For example:

Given the alarm for "gas," don the field protective mask within 9 seconds.

Provided a rough draft, type a letter at a minimum speed of 40 words per minute.

Given a mission, generate a 5-paragraph order per the reference in less than 2 hours.

d. **Realistic** The standard must be realistic in order to expect the student to perform the behavior based on the instruction provided. A standard is deemed realistic when the time, accuracy, and completeness criteria allow for successful completion.

2204. RECORD LEARNING OBJECTIVES

Before writing a learning objective, the curriculum developer must understand that the Learning Objective Worksheet (LOW) is produced as documentation for the Master Lesson File (MLF). All learning objectives must be recorded in MCAIMS for the production of LOWs, inclusion in the MLF, and assignment to concept cards. The LOW is a required element of the Master Lesson File (MLF). Refer to Chapter 3, Section 3800 for more information on the required MLF components. The LOW contains the TLO behavior and, if necessary, a rationale for downgrading. The LOW also contains test/evaluation items for learning objectives and selected methods and media. See Appendix A for the LOW and Appendix C for the LOW Checklist. Test items, methods, and media are covered later in this chapter. To ensure that the curriculum produced during the Develop Phase matches the task in the ITS/T&R, the learning objectives must be copied verbatim to the lesson plan and student materials.

2205. WRITING TERMINAL LEARNING OBJECTIVES

The ITS/T&R describes the real-world task the Marine performs in the Operating Forces. The TLO behavior describes the task the student performs in the instructional setting. The TLO must be directly related to the ITS/T&R because instruction must prepare the student for the job. For each task in the ITS/T&R designated to be taught at the formal school/detachment, one TLO is required. The school must attempt to replicate as closely as possible the task behavior, condition, and standard of the ITS/T&R in the TLO.

The school must attempt to accommodate the task behavior, condition, and standard of the ITS/T&R in the TLO.

1. Record Behavior from ITS Order/T&R Manual When writing a TLO, the first step is to copy the behavior directly from the ITS order/T&R manual. The paper-based Learning Objective Worksheet (LOW) found in Appendix A can be used to record the learning objective.

2. Record Condition and Standard from ITS Order/T&R Manual The next step in writing a TLO is to copy the condition and/or standard of the ITS order/T&R manual. Upon writing the condition and/or standard, it may be determined that minor modifications may be needed to reflect the actual conditions of the instructional setting and/or the standard by which mastery is measured. When writing ELOs, modifications to the condition and/or standard may be needed (i.e., the TLO is a performance based objective, however there needs to be a knowledge based ELO in order to master the TLO). Then, the modification must also be reflected in the TLO (i.e., the TLO's condition and standard must reflect every element in the subordinate ELOs).

3. Compare Formal School/Detachment Resources Against the Task List Ideally, the formal school/detachment delivers instruction that duplicates the real world task behavior. However, this is not always possible due to numerous limiting factors called resources (refer to list of resources on next page). The ultimate goal is to teach students the exact behaviors identified by the ITS/T&R (when those behaviors are performed in the instructional setting, they replicate verbatim as defined in the ITS/T&R). If the school does not possess the resources to teach the task/event to standard, there are two possible courses of action. The first is to downgrade the behavior and the second is to request additional resources.

a. If the school is going to downgrade the behavior, then the TLO is modified to accommodate the constraints of the instructional setting. Once the behavior is changed, a downgrade justification must be provided in the Program of Instruction (POI). Modification of the behavior is done only as a last resort and with the approval of Training Command. This situation may require a modification to the T&R event/ITS task. The conditions and standards of the ITS/T&R may have to be modified to accurately reflect what the student is or is not provided and how his/her performance is measured within the instructional environment. Figure 2-6, TLO Construction Flowchart, provides a guide for this decision making process. For more information on how to perform a downgrade justification in MCAIMS, see the MCAIMS User's Manual.

A group of ITSs describe and define the entire job.

b. If the school is going to request additional resources, then justification must be forwarded to CG, Training Command via formal correspondence. The justification must include rationale for why the task/event must be taught to standard and not downgraded. It must also include a detailed list of all additional resources and an explanation of how they will be used.

Resources include but are not limited to:

a. Time
b. Manpower
c. Facilities
d. Equipment
e. Budget
f. Safety (The ability to perform the task in an instructional environment safely)

The availability of these will impact how instruction is designed throughout the course.

STEP 4

4. Determine Evaluation Methods How are students going to be evaluated during this training evolution? This determination is based on a combination of the formal school/detachments resources and the task behavior statements. Ideally, the formal school/ detachment is able to employ an evaluation method that matches the behavior identified in the task statement. If the task is performance-based (psychomotor), then performance evaluation of the process, the product, or both needs to occur. If the behavior is knowledge-based (cognitive), then the evaluation will be written or oral. Regardless the method of evaluation selected, a provision for remediation of tasks/events not mastered by students must also be taken into account. Resources are allotted for review and the retesting of these individuals but must also be accounted for within the Program of Instruction (POI) (Refer to Chapter 3, Section 3201 on Exam Concept Cards). Since resources are often limited, performance-based evaluation and remediation are not always possible. However, every attempt must be made to secure required resources from TECOM to ensure that training and evaluation replicate actual job conditions and standards.

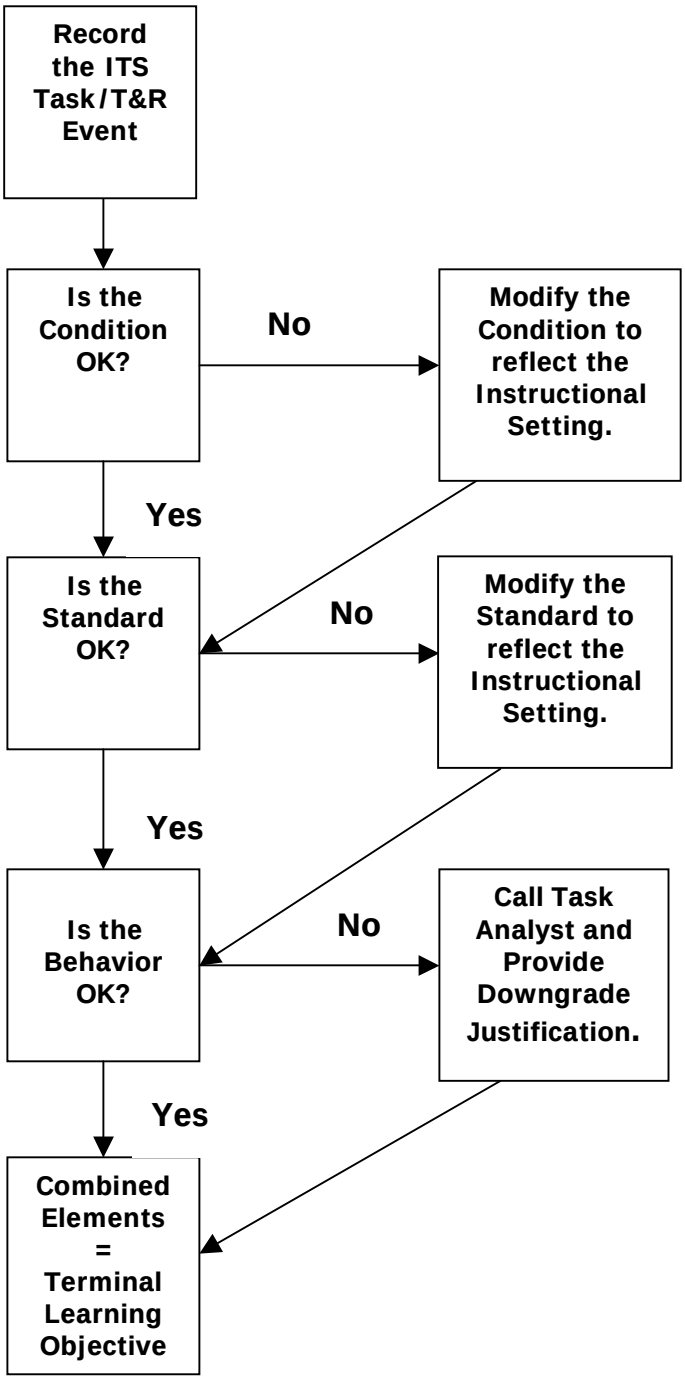
STEP 5

5. Complete TLO The final step is to write the complete TLO in the form of a complete sentence. For example: "Given an M16A2 service rifle and with the aid of reference, disassemble the M16A2 service rifle in accordance with the reference." Each TLO is individually numbered to ensure that each ITS/T&R is accounted for in the instruction. This number is important since it provides an audit trail that is used by the school and CG, Training Command to identify items in the Course Descriptive Data (CDD) and Program of Instruction (POI).

a. ITS's are numbered with the MOS/ITS number. For example 03XX.01.01, MCCS.01.01. (Marine Corps Common Skills)

b. T&R's are numbered by event. 57XX-OPS-1010

FIGURE 2-6
TLO Construction Flowchart



All learning objectives must be recorded in MCAIMS for production of LOWs, inclusion in the MLF, and assignment to concept cards. See MCAIMS User's Manual.

2206. WRITING ENABLING LEARNING OBJECTIVES

ELOs are written to emphasize teaching points and evaluate student understanding/ performance.

ELOs are subordinate to the TLO and are statements of behavior, condition, and standard to achieve the TLO. ELOs are derived from the identified knowledge and skills needed by the students to perform the steps identified in the ITS/T&R task. Remember, the number of ELOs is not necessarily equal to the number of ITS/T&R performance steps. There may be more ELOs or less depending on how KSAs were grouped. ELOs are written to emphasize teaching points and to evaluate student understanding/performance.

Since every task performed has a definitive beginning and end, all TLOs require a minimum of two ELOs.

ELOs are determined in the Learning Analysis when a list of required knowledge and skills are generated. One behavior is developed for each grouping of common, similar, or duplicative knowledge and skills that are assigned an "alpha" designator. This behavior is derived by keeping the evaluation method in mind and answering the following question: **"What one behavior will the students perform that confirms they possess the grouped knowledge/skills?"**

ELOs support the TLO, therefore any addition to the condition and/or standard must also be added to the TLO. Since every task performed has a definitive beginning and end, all TLOs should have a minimum of two ELOs. ELOs provide the level of detail necessary to describe knowledge and skills needed to master the task. TLOs will not be repeated as ELOs since this is contrary to logical learning analysis.

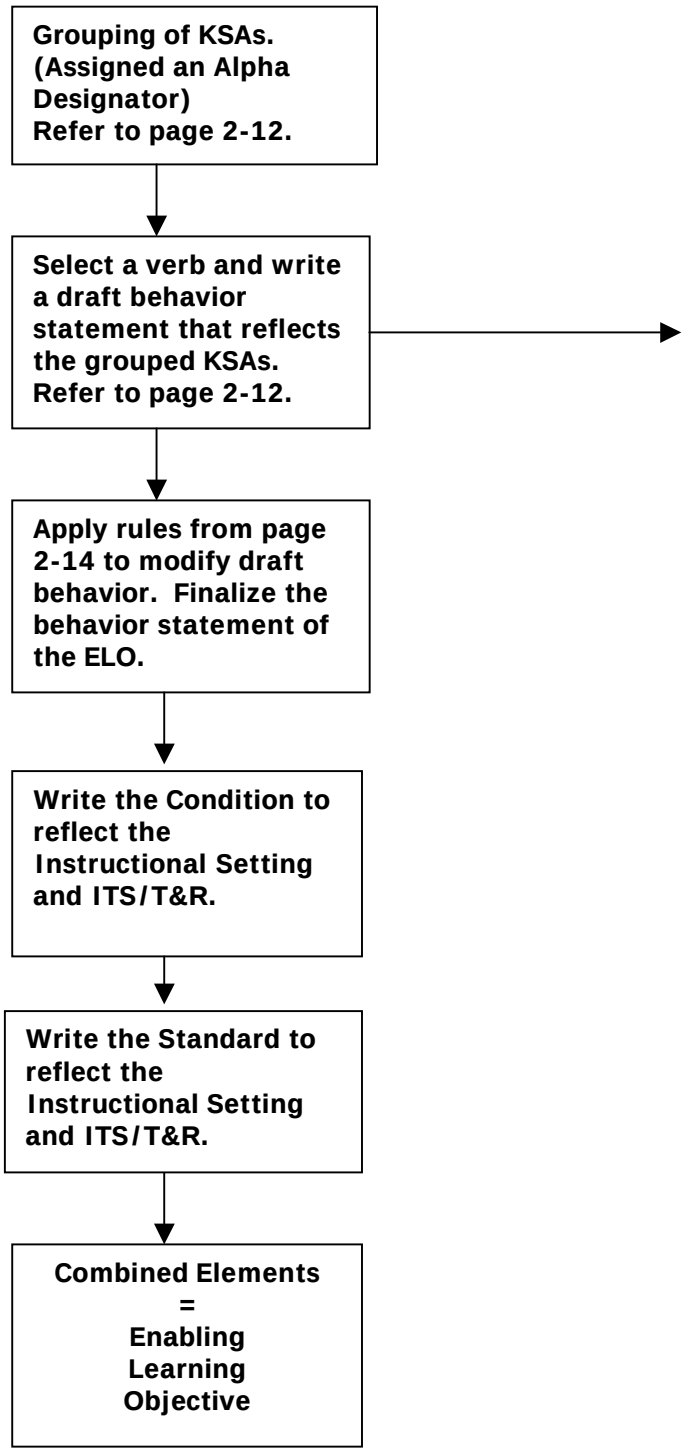
Below is a list of steps for writing ELOs. Figure 2-7 Enabling Learning Objective Construction Flowchart provides a flowchart of the steps.

1. Document the Behavior When writing an ELO, the first step is to document the behavior that was identified by each grouping of KSAs. The behavior identified may need to be modified so that it follows the rules of a well-written behavior. Refer to Section 2203 for more information on writing the behavior.

2. Determine the Condition and Standard As a rule, if the ELO condition and/or standard differs from the TLO's condition and/or standard, then that condition and/or standard needs to be added to the TLO. However, there may be extenuating circumstances when an ELO's condition and/or standard may differ from that of the TLO. Justification for the difference must be noted on the Learning Objective Worksheet (LOW) found in the Master Lesson File (MLF).

3. Record Completed Enabling Learning Objective The final step in writing the ELO is to record it. Like the TLO, the ELO must also be written in the form of a complete sentence. For example: Given an M16A2 service rifle and with the aid of reference, disassemble the M16A2 service rifle in accordance with the reference.

Figure 2-7. Enabling Learning Objective Construction Flowchart



All learning objectives must be recorded in MCAIMS for production of LOWs, inclusion in the MLF, and assignment to concept cards. See Domains of Learning (Section 6500) and MCAIMS User's Manual.

The verbs listed below are based upon the Levels of the Cognitive Domain. Refer to Chapter 6, section 6500 for more information on the Domains of Learning.

Knowledge	**Comprehension**	**Application**
arrange define list memorize name organize relate recall cite find group label match locate omit pick quote repeat rest identify recite hold check transfer tally point to underline	Translation: change reword render convert expand transform alter vary restate qualify Interpretation: infer define explain construe outline annotate expound Extrapolation: project propose advance contemplate submit advance calculate scheme contrive	relate utilize solve adopt employ use avail capitalize on consume exploit profit by mobilize operate ply handle manipulate exert exercise try devote handle wield put in action put in use make use of take up sketch illustrate apply choose
Analysis	**Synthesis**	**Evaluation**
breakdown uncover look into dissect examine divide simplify reason include deduce check audit inspect section scrutinize survey search screen	create combine build compile make structure reorder reorganize develop produce compose construct blend cause effect generate form	judge decide rate prioritize appraise assess rank weigh accept reject determine referee umpire classify decree rule on award criticize

2207. DEVELOP TEST ITEMS

The purpose of any test is to find out whether the objectives have been achieved. If the task is important enough to dedicate resources to teach, it is equally important enough to dedicate resources to evaluate. Test items are designed to determine if the learner has acquired the KSAs to perform an objective or task. This promotes learner development by providing feedback to the student and enabling the student to demonstrate mastery. Evaluation is also critical to maintaining or improving the effectiveness of instruction.

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1. Analyze the Learning Objective Learning objectives tell the student what he/she is expected to know or be able to perform following instruction. Test items are written to assess the student's level of mastery of the learning objective. Prior to writing test items, the curriculum developer must analyze the behavior, condition, and standard.

a. **Behavior** The test item must be written to evaluate whether the student has acquired the knowledge, skills, and/or developed the appropriate attitude required by the learning objective. The verb used in the behavior will either require knowledge or performance. The behavior tells the curriculum developer whether the test will be knowledge-based or performance-based. The only exception is when there is a downgrade justification. Refer to Section 2205 for more information on downgrade justification.

b. **Condition** The condition provides directions to the student on what will be available and under what conditions he/she will be tested. For example, "given a scenario" as a condition statement means to the test developer that a scenario will need to be a part of the test item.

c. **Standard** The standard establishes the criteria of how well the event is to be performed. The standard, as it is expressed in the learning objective, may need to be reiterated verbatim in the test item or in the test instructions.

Test items that are written to reflect the behavior, condition, and standard outlined in the learning objective are called **criterion-based test items**. The test item is written so that the student will perform the behavior stated in the learning objective, under the conditions specified, and to the established standard. If the behavior is to "Disassemble the M16A2 Service Rifle," then the test item cannot require the student to both disassemble (psychomotor) and to list sequentially the steps (cognitive) to disassemble the M16A2 service rifle. To be consistent, the curriculum developer must ensure that the test item replicates the behavior statement. In this M16A2 example, the proper test item would be disassemble (psychomotor). Remember, the learning objective is a contract between the instructor and the student.

2. Determine Type of Test Item

Performance-based (psychomotor/cognitive) and knowledge-based (cognitive) are the two types of test items used to measure student mastery of learning objectives.

The Marine Corps strives for performance-based instruction and testing to increase the transfer of learning from the instructional environment to the job. For this reason, the TLO is derived from the ITS (the actual performance). The ELOs are derived from KSAs needed to support the TLO. A test item that requires the student to perform a task (or part of a task) that is performed on the job (whether the performance is filling out forms, writing operations orders, or operating a radio) is considered a performance-based test. In some circumstances, a performance test may be a written test designed as a job sample for personnel whose responsibilities involve administrative duties. For example, completing a DD Form 1057 is a valid performance test for a student who must prepare one on the job. A performance test duplicates the job behavior(s) by using the same equipment, resources, setting, or circumstances that the student will encounter on the job.

a. **Performance Test Items** Performance test items are used to measure the knowledge of a subject as well as the ability to perform the skills. Knowledge at each of the learning levels (e.g., fact, rules, procedures, discriminations, and problem solving) may be required to successfully perform the skill. Refer to Chapter 6, Adult Learning, for more information on learning levels.

A performance test item can evaluate a process, a product, or both. The type of test item that evaluates a process is valuable for tasks where, if the process is not fully evaluated, much could be lost in the evaluation of the final product. For instance, if a student makes a mistake in the process, but the end result is correct, evaluators using this method are aware that a mistake was made. A performance examination that evaluates a product must use specific criteria to measure how well the student meets the desired outcome/objective. This type of test item is useful for evaluating tasks that can be performed in a number of different ways and still achieve the desired outcome. It is possible to have a test item that evaluates both the process and product.

FOCUS OF ASSESSMENT	
Assessing the Process	▪ There is no product or product evaluation is infeasible (e.g., unavailable or too costly). ▪ The procedure is orderly and directly observable. ▪ Correct procedure is crucial to later success. ▪ Analysis of procedural steps can aid in improving a product.
Assessing the Product	▪ Different procedures can result in an equally good product (e.g., writing a theme). ▪ The procedure is not available for observation (e.g., take-home work). ▪ The procedural steps have been mastered. ▪ The product has qualities that can be clearly identified and judged.

Assessment of Student Achievement. By Norman E. Gronlund. pp. 142-143.

PERFORMANCE BASED TEST ITEMS
Advantages
1. Can evaluate complex learning outcomes and skills that cannot be evaluated with traditional paper-and-pencil test. 2. Provides a more natural, direct, and complete evaluation of some types of reasoning, oral, and physical skills. 3. Provides greater motivation for students by clarifying goals and making learning more meaningful. 4. Encourages the application of learning to "real life" situations.
Limitations
1. Requires considerable time and effort to use. 2. Judgment and scoring performance can be subjective and burdensome, if the evaluator is not knowledgeable in the assessment of the student's performance. 3. Evaluation must frequently be done individually, rather than in groups. If evaluation is done in groups, careful allocation of task mastery must be adhered to so that performers are not penalized for non-performers.

Assessment of Student Achievement. By Norman E. Gronlund. p. 137**.**

b. **Knowledge (Cognitive) Test Items** Time, cost, safety, and resource constraints do not always permit performance-based instruction and evaluation. If learning objective behaviors must be adapted and cannot duplicate the behavior, conditions, and standards of the job, the test item still must mirror the learning objective. Once the actual behavior is adapted, a knowledge-based learning objective and written test item are developed. Written test items can still provide realistic scenarios and circumstances, but must measure the stated learning objective. For example, if resource constraints prevent the formal school/detachment from having the students "climb a mountain," an adapted learning objective and corresponding written test item would be to "describe the steps to climb a mountain." Some new information must simply be measured through cognitive evaluation.

Knowledge Test Items:

- ☑ True/False
- ☑ Multiple Choice
- ☑ Matching
- ☑ Listing
- ☑ Fill-in-the-Blank
- ☑ Short Answer
- ☑ Labeling
- ☑ Essay

Figure 2-8

Figure 2-8 is a list of the types of knowledge test items. The following paragraphs describe and outline the advantages and disadvantages of each.

c. **True/False Test Items** This type of test item is rarely effective for testing higher-level cognitive skills. It deals mostly with simple factual information and recall. Alone, this test item should not be used for evaluation because a true/false test item always runs a fifty percent chance of being guessed. Therefore, it is not as reliable as other test items. It would not be a good idea to send a graduate from the school out on the job based on evaluations supported solely by true/false test items. The students could have guessed their way to graduation. Another drawback to this item is that it is also extremely difficult to write one correctly. Most true/false items are poorly written. However, when used in conjunction with a short answer test item requiring the student to justify responses, this helps solidify the student's comprehension of the topic/task.

True/False test items are the least preferred method of testing in the Marine Corps. However, when used in conjunction with a short answer test item, T/F items can help solidify the student's comprehension of the topic/task.

TRUE/FALSE CHOICE ITEMS
Advantages
1. The item is useful for outcomes where there are only two possible alternatives (e.g., fact or opinion, valid or invalid). 2. Less demand is placed on reading ability than in multiple-choice items. 3. A relatively large number of items can be answered in a typical testing period. 4. Complex outcomes can be measured when used with interpretive exercises. 5. Scoring is easy, objective, and reliable.
Limitations
1. It is difficult to write items beyond the knowledge level that are free from ambiguity. 2. Making an item false provides no evidence that the student knows what is correct. 3. No diagnostic information is provided by the incorrect answers. 4. Scores are more influenced by guessing than with any other item type.

Assessment of Student Achievement. By Norman E. Gronlund. p. 79.

d. **Multiple-Choice Test Item** This type of test item is versatile and flexible. It is also the most common, and probably the most abused, of all test items. This item can measure a wide range of cognitive abilities ranging from simple recall of information to understanding of complex concepts. It is a quick and easy item to score whether using computerized grading or a paper-based answer key. This is one of the primary reasons this type of test item is seen so much in formal schools that process large groups of students. It is time efficient as well as fairly simple to construct if a few rules are followed.

MULTIPLE CHOICE ITEMS
Advantages
1. Learning outcomes from simple to complex can be measured. 2. Highly structured and clear tasks are provided. 3. A broad sample of achievement can be measured. 4. Incorrect alternatives provide diagnostic information. 5. Scores are less influenced by guessing than true-false items. 6. Scoring is easy, objective, and reliable.
Limitations
1. Constructing good items is time consuming. 2. It is frequently difficult to find plausible distracters. 3. This item is ineffective for measuring some types of problem solving and the ability to organize and express ideas. 4. Reading ability can influence score.

Assessment of Student Achievement. By Norman E. Gronlund. p. 60.

e. **Matching Test Item** A matching test item is used to measure a student's ability to recognize facts and discriminate among related or similar items. Matching test items normally use two columns of related items, and students are required to match a series of items listed in one column with related items in the other column. It provides a way to test various knowledge factors simultaneously.

Always have more responses than premises. This keeps the student from ascertaining correct responses by process of elimination.

MATCHING ITEMS
Advantages
1. A compact and efficient form is provided where the same set of responses fit a series of item stem (i.e., premises). 2. Reading and response time is short. 3. This item type is easily constructed if converted from multiple-choice items having a common set of alternatives. 4. Scoring is easy, objective, and reliable.
Limitations
1. This item type is largely restricted to simple knowledge outcomes based on association. 2. It is difficult to construct items that contain a sufficient number of responses that are of similar kind or nature. 3. Susceptibility to irrelevant clues is greater than in other item types.

Assessment of Student Achievement. By Norman E. Gronlund. p. 85.

f. **Listing Test Item** A listing test item measures the student's knowledge of information presented during instruction. This item requires the student to list a specified number of items in response to a question. Listing test items should not be used if the student's grammar skills are not at the appropriate level (refer to TPD).

LISTING ITEMS
Advantages
1. Easy to write. 2. Guessing is less likely than in selection-type items. 3. Preparation time is less than that for selection-type items.
Limitations
1. It is difficult to phrase statements so that only one answer is correct. 2. Spelling ability contaminates scoring. 3. Scoring is tedious and time-consuming.

g. **Fill-in-the-Blank Test Items** This type of item tests the student's knowledge and/or comprehension of information presented during instruction. A fill-in-the-blank test item requires the student to write a short answer in the blanks provided within the statement/question. The maximum number of blanks should be limited to two within a question or statement. Fill-in-the-blank test items are written as statements and do not require an action verb. Fill-in-the-blank test items do not test the student's ability to organize thoughts and ideas., and are not useful for problem solving.

h. **Short Answer Test Items** A short answer test item is used to evaluate the student when recall is important. Short answer is referring to a one word, number, or very short phrase type of response. The student creates the answer. Short answer test items are good to use, as they do not have a list to select from or something to help jog the student's memory. This type of item is unsuitable for complex learning.

FILL IN THE BLANK/SHORT ANSWER ITEMS
Advantages
1. Easy to write. 2. Guessing is less likely than in selection-type items. 3. Well suited to computational problems and other learning outcomes where supplying the answer is important. 4. A broad range of knowledge outcomes can be measured.
Limitations
1. It is difficult to phrase statements so that only one answer is correct. 2. Scoring is contaminated by student's spelling ability. 3. Scoring is tedious and time-consuming. 4. Not very adaptable to measuring complex learning outcomes.

i. **Labeling Test Items** Labeling or identification test items are used to measure a student's ability to recall facts and label parts in pictures, schematics, diagrams, or drawings. This form of test is most often used to measure recognition of equipment components or other concrete objects. It has wide application when teaching complex processes, especially via Interactive Multimedia Instruction (IMI).

LABELING ITEMS
Advantages
1. Tests student's visual recognition of equipment components or other concrete objects. 2. Guessing is unlikely. 3. Scoring is easy.
Limitations
1. Must have a good diagram, sketch or illustration to be effective. 2. Scoring is contaminated by student's spelling ability.

j. **Essay Test Items** The essay test item is fairly simple to produce by the instructor and requires complex thought by the student. It differs from the test items covered so far in that it generally requires the student to communicate the response to the evaluator in his or her own words. The nature of the test item makes it one of the most difficult for a student to complete and also, by far, the most difficult to evaluate. The evaluator is also often required to make a subjective assessment on whether the student has communicated the correct response. It is critical that the student clearly understand the requirements of the learning objective, and that the instructor replicate the learning objective in the essay test item. Essay test items are usually used for learning objectives that are not readily measurable such as certain mental skills like judging, problem solving, evaluating, and analyzing to name just a few.

Assessment of Student Achievement. By Norman E. Gronlund. p. 103.

ESSAY ITEMS
Advantages
1. The highest level learning outcomes (analysis, synthesis, evaluation) can be measured. 2. Preparation time is less than that for selection-type items. 3. The integration and application of ideas is emphasized.
Limitations
1. Each question is time intensive for measuring or achieving each learning objective. 2. It is difficult to relate to intended learning outcomes because of freedom to select, organize, and express ideas. 3. Scores are raised by writing skill and bluffing and lowered by poor handwriting, misspelling, and grammatical errors. 4. Scoring is time consuming, subjective, and tends to be unreliable.

STEP 3

3. Write Test Items Once the decision has been made on the type of test most appropriate to use for an objective, the curriculum developer must write the test item(s). During this step, the curriculum developer is writing test items to be recorded on the LOW. Grading criteria and the construction of the test occurs in the Develop Phase. Refer to Section 3500 for information on Constructing Tests. Each type of test item has different sets of guidelines to follow. Following these guidelines will assist the curriculum developer to write valid test items.

a. **Writing Performance-Based Test Items** This involves stating the performance objective, creating the checklist (if applicable), instructions to the evaluator, and instructions to the student.

When developing performance test items, use the following steps:

For an example of a performance-based test item see Figure 2-9.

1. **State the performance objective as a brief description of what the student must accomplish for successful completion of the performance test.**
2. **List steps/activities/behaviors (process) or characteristics (product).**
3. **Note common errors that are made when using the checklist.**
4. **Arrange the activities or steps and characteristics in correct order.**
5. **Review the checklist for accuracy and completeness.**

1) **Checklist** Performance test items, which require the student to perform a task, usually have the format of a checklist. The checklist is developed to correspond to the steps or activities of the task being performed and the underlying knowledge and skill elements. Checklists need to be detailed. This may help identify precisely what occurred during performance. The checklist should identify elements that have been taught and measure the behavior. Ensure that **all** the criteria are included so that the evaluator will be able to tell how well the student meets the objective. A checklist can be either a YES/NO (Mastery/Non-mastery) checklist or a scaled credit checklist with points for each specific action that the student performs. The formal school/detachment will identify which of these will be used in the overall evaluation of the student (See scoring and grading in Test Construction, Section 3504). Additionally, a determination of whether the student should have the checklist when being evaluated must be made. If the checklist will be used out on the job, then the student should be allowed to use the checklist during the evaluation.

2) **Process Checklist** When a performance test requires the steps or activities to be rated, a process checklist is used. The process checklist should contain all of the essential steps or activities required for successful performance. Process checklist construction guidelines are as follows:

   a) Use when the performance of steps or activities of a task is to be evaluated.
   b) The steps or activities must be observable.
   c) Define all of the steps or activities of the task being performed.
   d) Sequence steps or activities in order of performance.
   e) Provide space for "checking" the performance of each step or activity.
   f) Provide space for recording and describing errors.

3) **Product Checklist** When a performance test item requires the product of a process or task to be evaluated, it will be beneficial to use a product checklist. The product checklist should identify criteria or characteristics of product acceptability.

   a) Use checklist when the LO requires the student to produce a product.
   b) Use checklist when the product can be readily evaluated.
   c) Use checklist when there are no fixed or set procedures.
   d) Identify the characteristics of the product.
   e) Provide space on the checklist for product rating.
   f) Provide space on the checklist for comments about the product.

4) **Instructions to the Evaluator**

   a) The instructions specify all the information required by the evaluator to include the planning and set-up of the exam, ensuring required student materials are at hand, matching the conditions stated in the learning objective to perform the behavior.
   b) The instructions cover what the evaluator needs to evaluate the student, such as checklists, tools, etc.
   c) The instructions additionally state any start/stop signals, safety considerations, time limits that the instructor should emphasize to the student. Administrative information such as disposition of the completed evaluation needs to appear in the instructions, if necessary.
   d) The instructions must be detailed enough to cover everything the evaluator needs to know or do to make the evaluation happen.

5) **Instructions to the Student** Instructions include student directions, specifically any start/stop directions, any safety considerations, time limits, and how the performance will be evaluated. The instructions to the student must be clear to ensure that every student is evaluated on the ability to perform the behavior stated in the learning objective.

The instructions to the student must be clear to ensure that every student is evaluated on the ability to perform the behavior stated in the learning objective.

FIGURE 2-9. Sample Performance Checklist

Learning Objective: Without reference, given an M16A2 rifle, disassemble the rifle in 30 seconds in accordance with the procedures listed on pages 2-29 to 2-32 of FMFM 0-8.

Test Item:

1. **Instructions to the Evaluator:** Ensure you have an adequate training facility to conduct testing. Also, ensure the student has an M16A2 rifle. Inform the students that they have 30 seconds to disassemble the rifle. Inform students that if the time limit is not adhered to or he/she misses a step, the student will be given remedial training and retested. If the student fails a second time, he/she will be recommended for an academic review board. Ask the students if they have any questions. Tell the students to begin and evaluate the students by using the checklist provided. Once the test is completed, let the students know if they passed, send them to their next test station (if applicable), and turn completed checklist into Academics Chief.

2. **Instructions to the Student**: When the instructor says begin, disassemble the rifle. You have 30 seconds. You will be evaluated using a performance checklist detailing the disassembly procedures of an M16A2 rifle in accordance with FMFM 0-8. If you fail to complete this task in the time given you will receive remedial training. If you miss a step in the process you will receive remedial training. After completion of remedial training, you will be retested. If you fail to pass the second attempt, you will be recommended for an academic review board. Do you have any questions? You may begin.

3. **Performance Checklist**	YES	NO
a. Cleared the rifle.	___	___
b. Removed the sling.	___	___
c. Removed the hand guards.	___	___
d. Separated rifle into two main groups.	___	___
e. Removed the charging handle.	___	___
f. Disassembled bolt carrier group.	___	___
1) Removed firing pin retaining pin.	___	___
2) Removed the firing pin.	___	___
3) Removed cam pin.	___	___
g. Disassembled the weapon in 30 seconds or less.	___	___

b. **Writing Knowledge-Based Test Items**

1) **True/False Test Items.** True/False items are comprised of statements rather than questions. The item must be directly related to a learning objective. True/False items are designed to test knowledge, which means that they should be related to "knowledge" (Know-How-To or Know) from the learning analysis. Guidelines for writing true/false test items are as follows:

a) Include only one idea in each statement.
b) Place the crucial element at or near the end of the statement.
c) Avoid using negatives such as "no" or "not." They tend to confuse students.
d) Do not use absolutes such as "all," "every," "none," and "never."
e) Do not use statements containing "some," "any," and "generally."

Below is a checklist that can be used to evaluate true/false test items.

TRUE/FALSE ITEMS CHECKLIST		
	YES	**NO**
1. Is this type of item appropriate for measuring the learning objective?		
2. Does each statement contain one central idea?		
3. Can each statement be undisputedly judged true or false?		
4. Are the statements brief and stated in simple, clear language?		
5. Are negative statements used sparingly and double negatives avoided?		
6. Are statements of opinion attributed to some source?		
7. Is there approximately an even number of true and false statements?		
8. When arranged in the test, are the true and false items put in random order?		

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Learning Objective:

Without the aid of reference, given a M16A2 service rifle, associated equipment and ammunition, identify "make safe" procedures in accordance with the FMFM 0-8.

Test Item: When given the command to "make safe," the shooter will place the M16A2 service rifle in Condition 3. **True** _____ **False** _____

Figure 2-10 Sample True False Test Item

Incomplete Stem:
_____is the first step in disassembling the M16A2.

Complete Stem: When disassembling the M16A2, what is the first step?

Correct response:

c. Clear the weapon.

Distracters:

a. Take out the buffer.

b. Take off the hand guards.

c.

d. Take off the Lower receiver.

Components Multiple Choice Test Items. Before getting into the rules for writing this type of test item, the various components of a multiple-choice test item need to be discussed. There are three basic components to this test item: the stem, the responses, and the distracters.

1. **Stem.** The stem is a statement of the problem and should be worded in simple and understandable terms. Wording should be appropriate to the subject matter and to the group being tested. The solution to the problem should not depend upon the student's ability to translate complex sentence structure contained in the stem. Basically, there are two types of stems: the incomplete statement or the complete statement (usually in the form of a question).

2. **Responses.** Apart from the stem, the test item also consists of several possible answers or responses; only one of which is to be accepted as the correct response. There are only two types of responses, the correct response and alternative responses. Alternative responses are also known as distracters.

3. **Distracters.** Distracters are incorrect alternative responses to the question; however, all distracters are worded to be believable. Using commonly mistaken ideas and common misconceptions concerning the subject matter can best compose distracters. Care should be taken in forming the distracters. Distracters should not be designed to deceive students; rather, they are designed so that a student who does know the material will clearly know that the distracter is an incorrect answer. The student who does know the material should be able to select the correct response. Do not fall into the trap of presenting the student with a choice between several "correct" responses.

2) **Writing Multiple Choice Test Items.** Multiple choice test items are used to test facts and application of rules and procedures. They may also be used to test discriminations and problem solving. Guidelines for writing multiple choice test items are as follows:

a) Do not use the articles “a” and “an” at the end of the stem; this tends to indicate the correct answer.
b) All responses should follow grammatically from the stem.
c) All responses should be of approximately the same length.
d) All responses should have a similar grammatical structure.
e) All responses should use similar terminology.
f) Provide as many responses as necessary but normally four.
g) Position the correct response randomly throughout the test.
h) Ensure that there is only one correct answer.
i) Distracters should be plausible (believable) but incorrect.
j) Logically order all responses. Examples are smallest to largest, chronological order, or whatever makes sense.
k) Underline or CAPITALIZE all negatives and "in sequence" words. It is best if negatives are not used in the stem.
l) Ensure that all items are independent from other items. No hints at the answer to other test items should be in any item.
m) Avoid "all of the above," "none of the above," or "A and B only" in responses. This kind of response reduces the validity and reliability of test items.
n) Avoid the use of absolutes such as "never" or "always" since they tend to assess the student's attention to detail rather than the subject.
o) Never use double negatives or double-talk, such as “What response is never true?”

Learning Objective: Without the aid of reference, select in sequence the basic steps for performing preventive maintenance on the M16A2 service rifle in accordance with FMFM 0-8.

Test Item: IN SEQUENCE, select the basic steps for performing preventive maintenance on the M16A2 service rifle.

a. Disassemble, clean, lubricate, inspect, reassemble, clear, perform functions check.
b. Clear, disassemble, clean, inspect, lubricate, reassemble, perform functions check.
c. Disassemble, clean, reassemble, lubricate, perform function check, clear, inspect.
d. Clear, disassemble, clean, inspect, reassemble, lubricate, perform functions check.

Figure 2-11. Sample Multiple Choice Test Item

MULTIPLE-CHOICE ITEMS CHECKLIST		
	YES	**NO**
1. Is this type of item appropriate for measuring the intended learning outcome?		
2. Does the item task match the learning task to be measured?		
3. Does the stem of the item present a single, clearly formulated problem?		
4. Is the stem stated in simple, clear language?		
5. Is the stem worded so that there is no repetition of material in the alternatives?		
6. Is the stem stated in positive form wherever possible?		
7. If negative wording is used in the stem, is it emphasized (by underlining or caps)?		
8. Is the intended answer correct or clearly best?		
9. Are all alternatives grammatically consistent with the stem and parallel in form?		
10. Are the alternatives free from verbal clues to the correct answer?		
11. Are the distracters believable (plausible) and attractive to the uninformed?		
12. To eliminate length as a clue, is the relative length of the correct answer similar to that of the distracters?		
13. Has the alternative "all of the above" been avoided and "none of the above" used only when appropriate?		
14. Is the position of the correct answer varied so that there is no detectable pattern?		
15. Does the item format and grammar usage provide for efficient test taking?		

Assessment of Student Achievement. By Norman E. Gronlund. p.75.

3) **Writing Matching Test Items.** A matching test items contains a list of premises (items that require responses), a list of responses (possible answers), and a brief explanation of how the premises and response are related. Guidelines for writing matching items are as follows:

a) Provide, clear, concise directions on how to match the items in the two columns.
b) Indicate whether the responses may be used more than once.
c) Limit test items to a single area of choices to a single subject category.
d) Arrange the responses in the same logical order.
e) The responses and premises should have parallel grammatical construction.
f) Keep each list of premises and responses as brief as possible. It is recommended to have no more than ten items.
g) Always have more responses than premises.
h) The entire matching test item should be kept on the same page.

Learning Objective: Without the aid of reference, identify the individual components of the three main groups in a M16A2 service rifle per TM 05538C-10/1.

Test Item: Column A contains the three main groups of the M16A2 service rifle and column B contains a list of individual rifle components. Match the components to its main group.

A	B
___ Upper receiver	a. Hand guards, rear sight, ejection port.
___ Lower receiver	b. Bolt, firing pin, cam pin.
___ Bolt carrier group	c. Slide, half cock notch, ejector.
	d. Selector switch, magazine release, trigger.

Figure 2-12. Sample Matching Test Item

MATCHING ITEMS CHECKLIST		
	YES	NO
1. Is this type of item appropriate for measuring the intended learning outcome?		
2. Does the item task match the learning task to be measured?		
3. Does each matching item contain only similar material?		
4. Are the lists of items short with the brief responses on the right?		
5. Is an uneven match provided by making the list of responses longer or shorter than the list of premises?		
6. Are the responses in alphabetical or numerical order?		
7. Do the directions clearly state the basis for matching and that each response can be used once, more than once, or not at all?		
8. Does the complete matching item appear on the same page?		

Assessment of Student Achievement. By Norman E. Gronlund. p. 87.

4) **Writing Listing Test Items.** A listing test item requires the student to list a specified number of items in response to a question. For example, a student may be asked to list the seven basic steps for performing preventative maintenance on the M16A2. Listed below are a few guidelines to keep in mind when writing a listing test item.

   a) The student should always be told the number of items to be listed.
   b) A listing test item can cover a complete procedure; such as, the steps in the process of disassembling the M16A2.
   c) If the sequence of the process is important for the student to know, then "in sequence" should be highlighted or printed in bold text. For instance, if a Marine were being tested on failure to fire procedures before going to the rifle range, then “in sequence” would be very important.

Learning Objective: Without the aid of reference, list in sequence the five phases of the SAT process in accordance with SAT Manual.

Test Item: List IN SEQUENCE the five phases of the SAT process.

_____
_____
_____
_____
_____

Figure 2-13. Sample Listing Test Item

5) **Writing Fill in the Blank Test Items.** A fill in the blank test item requires the student to recall facts and supply one or more key words that have been omitted from the statement. When placed in the appropriate blanks, the word(s) make the statement complete, meaningful, and true. Listed below are a few guidelines to keep in mind when writing a listing test item.

   a) Leave blanks for key words only.
   b) Keep items brief.
   c) Make all blanks approximately the same size.
   d) Grammatical cues to the correct answer, such as the articles "a" and "an" just before the blank, should be avoided.
   e) Ensure that only one correct answer is possible for each blank.
   f) Ensure that the sentence has enough context to cue the correct response.

Learning Objective: Without the aid of reference, describe in writing the performance characteristics of the M16A2 service rifle in accordance with TM 05538C-10/1.

Test Item: The maximum effective range of the M16A2 service rifle is _____ meters at individual/point targets and _____ meters at area targets.

Figure 2-14. Sample Fill In The Blank Test Item

6) **Short Answer Test Items.** Listed below are a few guidelines to keep in mind when writing a short answer test item.

   a) Phrase the item so that the required response is concise.
   b) May use a question or a statement.
   c) Provide space for student to answer.
   d) Provide same amount of space for each answer.

Learning Objective: Without the aid of reference, describe in writing the performance characteristics of the M16A2 service rifle in accordance with TM 05538C-10/1.

Test Item: State the cyclic rate of fire for the M16A2 service rifle.

_____

Figure 2-15. Sample Short Answer Test Item

SHORT ANSWER/FILL IN THE BLANK ITEMS CHECKLIST		
	YES	**NO**
1. Is this type of item appropriate for measuring the intended learning outcome?		
2. Does the item task match the learning task to be measured?		
3. Does the item call for a single, brief answer?		
4. Has the item been written as a direct question or a well-stated incomplete sentence?		
5. Does the desired response relate to the main point of the item?		
6. Have clues to the answer been avoided (e.g., "a" or "an," length of the blanks)?		
7. Are the units and degree of precision indicated for numerical answers?		

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7) **Labeling Test Items.** Listed below are a few guidelines to keep in mind when writing a labeling test item.

   a) Make all sketches, drawings or illustrations clear and of sufficient size. If possible, use the actual parts of a unit.
   b) Provide sufficient information to indicate what the equipment is and which part is to be labeled.
   c) The parts to be labeled or identified should be clearly pointed out by using lines or arrows.
   d) Ensure that only one definite answer is possible.

8) **Essay Test Items.** An essay test item requires a more or less extensive discussion by the student. It should be used when the students are expected to recall facts, apply rules and procedures, and think reflectively or creatively, to organize knowledge in the solution of a problem, and to express their solution in writing. Listed below are a few guidelines to keep in mind when writing an essay test item.

a) State the essay test item clearly so the student knows exactly what type of discussion is expected.
b) The essay test item should ask for comparisons, decisions, solutions, cause-effect relationships, explanations, or summary.
c) When possible, use more essay test items and limit the discussion of each.
d) Set limits on essay test items such as time or number of words.

Learning Objective: Without the aid of reference, based upon the nature and theory of war, evaluate the Normandy Campaign.
Test Item: Within a one-hour time limit, compare and contrast the theories of war applied by the Axis and Allied forces in the invasion of Normandy.

ESSAY ITEMS CHECKLIST		
	YES	**NO**
1. Is this type of item appropriate for measuring the intended learning outcome?		
2. Does the item task match the learning task to be measured?		
3. Is the question designed to measure complex learning outcomes?		
4. Does the question make clear what is being measured?		
5. Has terminology been used that clarifies and limits the task (e.g., "describe," not "discuss")?		
6. Are all students required to answer the same questions?		
7. Has an ample time limit been indicated for each question?		
8. Have adequate provisions been made for scoring answers (e.g., model answers or criteria for evaluating)?		

Figure 2-16. Sample Essay Test Item.
Assessment of Student Achievement. By Norman E. Gronlund. p. 109.

STEP 4

4. Recording Test Items. Test items are recorded on the Learning Objective Worksheet (LOW), which is a required document of the Master Lesson File (MLF). Refer to Section 3600 for more information on the required MLF components. See Appendix A for the LOW and Appendix C for the LOW Checklist. Enter test items into the instructional management system (MCAIMS/TIMS). Entering test items into MCAIMS will facilitate the automated grading/scoring of tests, tracking of GPAs (if applicable), and test item analysis (discussed in Section 5300 of this manual). See MCAIMS User's Manual.

2208. SELECT INSTRUCTIONAL METHODS

One of the most important tasks to be performed by the curriculum developer or a member of a design team is selecting the instructional method. An instructional method is the approach used to present instruction. The method selected will have a direct impact on both the quality of the training system and its cost effectiveness. Any given lesson will probably incorporate two or more methods to serve different purposes at different points in the progression of the lesson.

STEP 1

1. Consider the Advantages and Limitations of Methods In order to evaluate instructional methods, consideration of the advantages and limitations inherent to each is required. There are twelve major types of instructional methods.

See Instructional Methods on the next several pages:

INSTRUCTIONAL METHODS	ADVANTAGES	LIMITATIONS
Lecture (Formal, Informal, Briefing, Guest). Formal lecture involves one-way communication used for reaching large audience in a classroom setting. Informal lecture involves considerable interaction between the instructor and student in both the form question and discussion.	☑ Ideal for presenting many ideas in a short time. ☑ Suitable for introducing a topic. ☑ Convenient for instructing large groups. ☑ Supplementing material from other sources.	☑ Does not provide an avenue for the instructor to estimate student progress. ☑ No active participation by students. ☑ Dependent on the instructor's speaking skills. ☑ Not responsive to individual needs of students. (Informal lectures however, accommodate these concerns)
Indirect Discourse (Panel Discussion, Dialogue, Teaching Interview). Involves verbal interaction among two or more persons, which is seen and heard by students. Some example include, dialogue, a teaching interview, a panel discussion (debate), skits, playettes, and other dramatizations.	☑ Can effectively be used for extremely large groups. ☑ Facilitates higher level cognitive skills. ☑ Class size is not an issue with this method.	☑ Does not permit students' needs to be satisfied. ☑ Instructors cannot gauge if learning has transferred. ☑ Requires a high level of instructor expertise to be effective. ☑ Recommended method to reach high levels of learning. ☑ Evaluation is not inherent in method. ☑ Not responsive to individual needs of students.
Demonstration. This instructional method is used to allow students to observe instructors perform a sequence of events. It is designed to teach a procedure, technique, or operation.	☑ Enables performance standards to be demonstrated. ☑ Provides immediate feedback. ☑ Method may be tailored during instruction. ☑ Responsive to individual needs. ☑ Extremely effective when used in conjunction with lecture or prior to practical application. ☑ Evaluation is inherent in method. ☑ Instructors can tell if learning has transferred.	☑ Time consuming to develop and requires a great deal of preparation. ☑ Requires a high level of expertise. ☑ Instructor must be able to anticipate student error. ☑ Best conducted in small groups. ☑ Success is dependent on demonstrator skills.
Reading (Books, Reference Publications, Web-based Material, Manuals, Handouts). The assignment to a student or printed materials including books, periodicals, microfilms, manuals and regulations, and handouts.	☑ Most effective and time efficient means of presenting material. ☑ Students progress at own pace.	☑ Not responsive to individual needs. ☑ Dependent on availability of resources. ☑ Evaluation is not inherent in method. (Should be used as a supplement with formal Marine Corps curricula. In cases of entry-level should be used sparingly.)

INSTRUCTIONAL METHODS	ADVANTAGES	LIMITATIONS
Self-Paced (Programmed, Modular, Computer Assisted, Mediated). Self-paced instruction is a learning program, which is organized so that students are allowed to move through it at their own pace under the guidance of an instructor. Some typical applications include, programmed instruction (paper and computer), modular instruction (prepackaged units of instruction containing clear statement of objectives, computer-assisted instruction (computer used as vehicle for interaction), and mediated instruction (slides, film, tapes, and cassettes).	☑ Accommodates learning rates. ☑ Provides immediate feedback. ☑ Responsive to individual needs. ☑ Evaluation is inherent the method.	☑ Has rigid rules and requires considerable development time. ☑ Instructor experience must be high to utilize this method effectively. ☑ Directed towards individual learning.
Questioning (Socratic Method, Student Query). Questioning as a method is used to emphasize a point, stimulate thinking, keep students alert, check understanding, review material, and seek clarification. Examples of this method are the Socratic method (instruction by asking students questions), and student query (students asking questions).	☑ Reaches higher levels of learning. Stimulates higher order thinking. ☑ Effective at developing mental skills. ☑ Evaluation is inherent this method. ☑ Responsive to individual needs and differences.	☑ Will not work if students are unfamiliar with the topic. ☑ Requires a high level of instructor expertise to be used effectively. ☑ Lends itself best to one-on-one or groups of 8-12 for instruction.
Discussion-Non Directed (Peer Controlled Seminar Free Discussion). Non-directed discussion is an individual/group interactive process in which task or objective-related information and experiences are evoked from a student or the group. This method places the responsibility for learning on the students through their participation.	☑ Works best if students have experience with lesson topic. ☑ Responsive to the individual needs of students.	☑ Danger the seminar method will pool ignorance. ☑ Natural leaders of the class may dominate discussion. ☑ Instructors play a limited/passive role. ☑ Recommended for both lower and higher level cognitive skills. ☑ Most effective for small groups of 8-12 students. ☑ Evaluation not inherent in method.

INSTRUCTIONAL METHODS	ADVANTAGES	LIMITATIONS
Guided Discussion. Guided discussion provides interaction among students and instructors. This instructional method develops concepts and principles though a group process and the unobtrusive guidance of the instructor.	☑ Involves interaction by all. ☑ Allows students to exchange ideas, values, and attitudes. ☑ Responsive to the individual needs of students. ☑ Effectively used for teaching in the Affective Domain.	☑ Not recommended for simple recall of information. ☑ Effective utilization of this method requires a high level of instructor expertise. ☑ Instructors must be able to judge value of student responses. ☑ 8-12 students is the optimum size to conduct a guided discussion. ☑ Evaluation is not inherent with this method.
Practical Application. Individual Projects. Students interact with things, data, or persons as necessary to develop the skills to master the learning objectives.	☑ Provides student's maximum flexibility to practice and demonstrate acquired skills in a controlled setting. ☑ Method combines well with other methods. ☑ Evaluation is inherent this method. ☑ Responsive to student's special weaknesses, interests, and needs.	☑ Time consuming. ☑ Require supervision and informal evaluation by the instructor. ☑ Can take place outside the classroom. ☑ Students need to acquire mastery for this method to be effective. ☑ One of the best methods for ensuring learning at higher levels of application, analysis, and evaluation. ☑ High level of instructor expertise ☑ Designed for individual instruction.
Field Trips. A field trip is an out-of-classroom experience where students interact with persons, locations, and materials or equipment for the attainment of objectives. Typically used for affective purposes rather than for measurable cognitive development.	☑ Students encounter real settings appealing to all senses. ☑ Method is highly recommended for reaching the affective domain.	☑ May require extensive logistical considerations. ☑ Instructor must be at the comprehension level. ☑ Not typically used as much for cognitive development. ☑ Evaluation not inherent in the method ☑ Not responsive to individual needs.

INSTRUCTIONAL METHODS	ADVANTAGES	LIMITATIONS
Simulations (Role-playing, Games). Simulations are low risk, educational experiences, which substitute for some real life situation. It may involve groups or whole units. Some kinds of simulations are role playing, in-basket exercises (used in random order to simulate a series of matters or decisions which a leader might actually encounter), organizational or management games- students manipulate an organization or some component part to produce certain outcomes, hardware simulations (students use trainers that resemble, to some degree, the equipment that is to be used on the job; e.g. flight simulator and virtual reality).	☑ Low risk and effective as capstone methods following a block of instruction. ☑ Students can operate at the highest cognitive level in a low-risk environment. ☑ Student weaknesses and strengths can be quickly identified and worked with. ☑ Recommend few students per instructor ☑ Evaluation is inherent in the method. ☑ Responsive to students needs.	☑ Not usually recommended for imparting knowledge to students. ☑ Knowledge is presumed to be prerequisite for this method. ☑ Elaborate versions may require special equipment. ☑ Few students per instruction during simulation itself. ☑ Simulation areas are of various sizes and configurations. ☑ Requires trained staff to conduct.
Case Study. A learning experience in which students encounter a real-life situation in order to achieve some education objective.	☑ Students develop new insights into the solution of specific on-the-job problems. ☑ No follow-up evaluation is necessary ☑ Responsive to student's needs, differences, and creativity. ☑ Evaluation is inherent in the method.	☑ Can be time consuming. ☑ One of the best methods for reaching higher levels in the cognitive domain ☑ Students must have thorough understanding at the comprehension level prior to starting. ☑ Level of instructor expertise is high. ☑ Size of class is normally small, but may accommodate larger groups.
Coaching. A learning experience where face-to face interaction occurs between the instructor and the student in order to meld individuals with diversified backgrounds, talents, experience and interests; encouraging them to accept responsibility and seek continued improvement and achievement.	☑ Enhances learning and enables performance standards to be demonstrated. ☑ Provides immediate feedback. ☑ Responsive to individual needs. ☑ Extremely effective when used in conjunction with lecture or prior to practical application. ☑ Evaluation is inherent in the method.	☑ Time consuming to develop. ☑ Requires a great deal of preparation. ☑ Requires a high level of expertise. ☑ Instructor must be able to anticipate student error. ☑ Best conducted in small groups or individually. ☑ Accommodates evaluation and instructors can tell if learning had transferred.

2. Review Method Considerations In addition to considering the advantages and limitations of each method, the curriculum developer must review the following: learning objectives, the TPD, adult learning principles, transfer of learning, and resource constraints.

a. **Learning Objectives** The method choice must complement the kind of learning to be undertaken by the students (e.g. cognitive, affective, psychomotor). Based upon the domain and the level required by the learning objective, methods of instruction are chosen that will enable students to perform at the specified level. A combination of methods work best. (See Chapter 6, Adult Learning, Section 6500 for more on Using Domains of Learning.)

> **For example:** If the learning objective required learners to assemble a piece of equipment, then the informal lecture method alone is inadequate to teach that particular skill. Since the objective is a motor skill, students would benefit by adding demonstration and practical application.

b. **Target Population Description (TPD)** Consider the level of motivation, background, knowledge, and skill level of the target population.

> **For example:** Since the case study method requires the learners to analyze and evaluate the subject matter, then case study method would not be the appropriate method for students with no prior knowledge.

c. **Consider Adult Learning Principles** Typically, adults are self-directed learners and bring their own experiences to the classroom. Research has shown that they learn best:

1) through problem-based learning.
2) in small groups.
3) when challenged.
4) NOTE: The TPD must also be considered along with these principles. (See Chapter 6 Adult Learning for more on Adult Learning Principles.)

> **For example:** If the course is entry level, the students would not bring a lot of experience to the classroom and problem-based learning would not be appropriatel. Also, courses for entry-level students are generally large in size, which may not allow for certain interactive methods.

d. **Transfer of Learning** Transfer of learning from the instructional environment to the job is most likely to happen when the conditions of learning best replicate what is being done on the job. Students are more likely to remember when instruction is active and geared toward different learning styles. When possible, incorporate all three learning styles (visual, auditory, and kinesthetic) into instruction. (See Chapter 6, Adult Learning, Section 6300 for more on Learning Styles.)

> **For example:** If it has been determined that the TPD learns best kinesthetically, then consider methods that are interactive and allow students them to do something. Simulation and/or practical application methods should be considered.

e. **Resource Contraints** Although resource constraints should not be the primary factor in determining instructional methods, availability of resources must be considered. This can include minimum level of instructor experience, class size, evaluation potential, and the ability to meet the individual needs of students. However, new methods will never be incoproated to break the status quo if curriculum developers do not identify them.

> **For example:** If the curriculum developer wanted to use the demonstration method to show students how to field strip various weapons, experience level of the instructors would need to be considered. In this particular case, instructor experience must be high in order for the demonstration to be successful.

3. Select Method

STEP 3

a. **Methods Selection Matrix** The methods selection matrix (see Figure 2-17) can be used for evaluating existing courses as well as planning new ones. Developers must keep in mind that the matrix provides recommendations based upon the assumptions listed below. With an understanding of these assumptions, the grid is a valuable tool for the curriculum developer to select methods of instruction. While these assumptions may affect the interpretation of the matrix, the grid's recommendations should be useful for all schools and courses under most situations.

Method Selection Grid Assumptions

Five Method Selection Matrix Assumptions

(1) The terms and categories follow the general terms and definitions of Bloom's Taxonomy/Domains of Learning. (See Chapter 6, Section 6300 for more on Domains of Learning).

(2) The lessons being analyzed are assumed to be relatively short. Extended periods of instruction present many considerations beyond the scope of this grid.

(3) The methods are analyzed in their "pure" form, that is, not combined with other methods. A method that is not recommended as an exclusive approach to instruction may be highly recommended in combination with another method.

(4) Quality instructional materials and adequate teaching skills must be present. Poorly prepared materials and weak instructor skills have a negative effect on all recommendations.

(5) The learners are adult and tend to be task oriented, highly motivated, possess prerequisite skills for a given learning situation, and often prefer interactive methodologies.

b. How to Use the Methods Selection Matrix

Matrix Selection Example

Behavior:
Clean the M16A2 service rifle.

Factors and Constraints:
Highly skilled instructors, large class, desire evaluation to be inherent and not concerned about individual needs.

1) Review the Domains of Learning in Chapter 6, Section 6300. Identify whether the learning objective is written in the Cognitive, Psychomotor, or Affective Domain. Find "Domains and Levels" in the left-hand column. Circle or highlight the correct level. *Using the matrix selection example in the left-hand column, the appropriate domain and level has been selected in Figure 2-17.*

   - For learning objectives that are written in the **Cognitive Domain**, identify whether the learning objective is written at the knowledge level, comprehension level or one of the higher levels.
   - For learning objectives that are written in the **Psychomotor Domain**, identify whether the learning objective is written at the lower level or higher level.
   - For learning objectives that are written in the **Affective Domain**, identify whether the learning objective is written at the lower level or higher level.

2) After selecting the appropriate level, then circle or highlight all of the HR's (Highly Recommended) for that row. By doing this, the methods that are highly recommended to be used are identified for that domain and level. The "Grid Key" is located in the upper left-hand corner. *In the example, the lower level Psychomotor Domain was selected in the last step. The HR's have been circled for that level in Figure 2-17.*

3) Next, find the "Factors and Constraints" section under the columns selected in the previous step and circle the factors and constraints for that column. *Refer to Figure 2-17 for an example.* This section allows the curriculum developer to review the factors and constraints to determine whether the method(s) indicated are feasible.

   - **Minimum Level of Instructor Expertise.** On this row, the level of instructor expertise required for the method is identified: "NI" (New Instructor) or "EI" (Experienced Instructor) .

CLASS SIZE
1 = indiv
2-12 = small
13-24 = medium
20+ = large

   - **Class Size.** On this row, the appropriate class size for the method is identified: lg (large), med (medium), sm (small), or individual.
   - **Evaluation Inherent in Method.** This row identifies whether the evaluation is inherent in the method.
   - **Responsive to Individual Needs.** This row identifies whether the method is responsive to individual needs.

4) Choose the method that **BEST** reflects the resource constraints and the Domain/Level of learning required to achieve the learning objective. Most methods will have limitations that the school will have to address. If the constraints cannot be overcome, then consider methods that are R (Recommended). However, methods with NR (Not Recommended) should not be used. See the bottom of matrix for method chosen.

See Methods Selection Matrix on the next page.

FIGURE 2-17 Methods Selection Matrix

METHODS SELECTION MATRIX

GRID KEY	PRESENTATION METHOD					STUDENT VERBAL INTERACTION METHODS			APPLICATION METHODS				
HR - Highly Recommended **R** – Recommended **NR** - Not Recommended **NI** - New Instructors **EI** – Experienced Instructors **LG** - Large Class **SM** - Small Class **Indiv** - Individual	Lecture (Formal, Informal Briefing, Student Speech)	Indirect Discourse (Panel Discussion, Dialogue, Teaching Interview)	Demonstration (Operation of Equipment, or System)	Reading (Books, Periodicals, Microforms, Manuals, Handouts)	Self-Paced (Programmed, Modular, Computer Assisted, Mediated)	Questioning (Socratic Method, Student Query)	Discussion-Non Directed (Peer-Controlled Seminar Free Discussion)	Guided Discussion (Instructor Controlled)	Practical Application (Individual or Group)	Field Trips	Simulations (Role-Playing, Games)	Case Study	Coaching
DOMAINS AND LEVELS													
COGNITIVE													
Higher Levels	NR	NR	NR	NR	R	R	NR	NR	HR	NR	HR	HR	NR
Comprehension	HR	HR	NR	R	HR	HR	NR	HR	R	NR	R	R	NR
Knowledge	HR	R	NR	HR	HR	NR	NR	NR	R	R	NR	NR	NR
PSYCHOMOTOR													
Higher Level	NR	NR	HR	NR	R	NR	NR	NR	HR	NR	R	NR	HR
Lower Level	NR	NR	HR	NR	R	NR	NR	NR	HR	NR	R	NR	HR
AFFECTIVE													
Higher Levels	NR	NR	NR	NR	NR	NR	NR	NR	NR	R	HR	HR	NR
Lower Levels	HR	HR	NR	R	R	R	R	HR	R	HR	HR	R	HR
FACTORS AND CONSTRAINTS													
Minimum Level of Instructor Expertise	NI	NI	EI	EI	EI	EI	N/A	EI	EI	NI	EI	EI	H
Class Size (1 = indiv; 2-12 = small; 13-24 = medium; 20+ = large)	LRG/ MED	LRG/ MED	SM*	INDIV	INDIV	SM/ MED	MED	SM/ MED	INDIV /SM**	SM	SM/ MED	SM/ MED	INDIV /SM**
Evaluation Inherent in Method	NO	NO	YES	NO	YES	YES	NO	NO	YES	NO	YES	YES	YES
Responsive to Individual Needs	NO	NO	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES

** Consider breaking class into small groups if the number of students is large and there is instructional staff to support it.

Demonstration and Practical Application will work, but more demonstrators and instructors will be needed to overcome the class size by breaking into groups. Even more instructors would be necessary for Coaching. Demonstration and Practical Application are the methods chosen.

STEP 4

4. Record Instructional Methods The instructional method chosen is recorded in MCAIMS for printing on the Learning Objective Worksheet (LOW).
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2209. SELECT INSTRUCTIONAL MEDIA

In any instructional situation there is a message to be communicated. Video, television, diagrams, multimedia, computers, and printed material are examples of media used to communicate the message. Media are the delivery vehicles used to present instructional material or basic sensory stimulus presented to a student to induce learning. In other words, the means used to give information to the students. Appropriate media ensures that information is presented to students by the most effective and cost-efficient means possible.

Selection of media types must not be influenced by the curriculum developer's experience as a student. Rather, the curriculum developer should select a media mix that is best suited for the TPD. Selection of media types must also take into consideration theories of adult learning.

1. Consider the Advantages and Limitations of Media

Media have various characteristics that make them either suitable or unsuitable for particular training situations. Consider the characteristics listed in Figure 2-18 carefully to ensure that the appropriate media are selected for the instructional system.

STEP 1

See Media Figure 2-18 on the next page.

MEDIA CHARACTERISTICS	ADVANTAGES	LIMITATIONS
Printed Materials. Printed material must be kept simple, yet meaningful; displaying only small amounts of information.	☑ Easily constructed. ☑ Easily duplicated. ☑ Effective for indoor use. ☑ May be enlarged, displayed, or distributed to students as a handout. ☑ Low cost. ☑ Readily available. ☑ Computer-generated graphics and charts can be easily revised.	☑ Can not be tailored to needs of students during instruction. ☑ Can only be used outdoors if weather permits. ☑ Time consuming if images are illustrations or photographs, or digital images. ☑ Flat pictures cannot be revised.
Chalkboards and Dry Erase boards. Common presentation media tools that are familiar to instructors and students alike.	☑ Easy to prepare and use. ☑ May be used to show development or buildup of an event or display. ☑ Allow information to be tailored during instruction. ☑ Effective when instruction calls for great deal of writing. ☑ Portable (in some instances). ☑ Low in cost. ☑ Readily available.	☑ Displays are not effective if lettering is not large enough to be seen by all.
Turn Chart. Simple and familiar in design, specifically in small interactive classes.	☑ Easy to prepare and use. ☑ May be used to show development or buildup of an event or display. ☑ Allow information to be tailored during instruction. ☑ Effective when instruction calls for great deal of writing ☑ Allows for interaction between instructor and students. ☑ Portable. ☑ Low in cost. ☑ Readily available.	☑ Displays are not effective if lettering is not large enough to be seen by all. ☑ Can only be used outdoors if weather permits, unless lamination is applied (cost factor).

Figure 2-18 Media Characteristics (continued)

MEDIA CHARACTERISTICS	ADVANTAGES	LIMITATIONS
Models/Mock-Ups. Models/Mock-Ups are representations of actual equipment, structures or devises. Models/Mock-Ups seek to represent actual items when items are too large, to difficult, or too dangerous to be brought into the classroom.	☑ Appeals to students' sense of touch. ☑ Realistic ☑ Shows details. ☑ Useful in demonstrations and hands-on experiences	☑ Time consuming to develop. ☑ May require specialized personnel. ☑ May require assistant instructors. ☑ Class size limited to the size of the model/mock-up. ☑ May be costly. ☑ May not be readily available. ☑ Cannot be revised (only minor modifications can be made).
Actual Item/Object. AIOs are the equipment or devices that are actually utilized in the performance of the task or job. AIOs may be too difficult, or too dangerous to be brought into an indoor classroom and therefore outdoor facilities may need to be utilized. Actual Item/Object. AIOs are the equipment or devices that are actually utilized in the performance of the task or job. AIOs may be too difficult, or too dangerous to be brought into an indoor classroom and therefore outdoor facilities may need to be utilized.	☑ Appeals to students' sense of touch. ☑ Realistic ☑ Shows details. ☑ Useful in demonstrations and hands-on experiences	☑ Time consuming to develop. ☑ May require specialized personnel. ☑ May require assistant instructors. ☑ Class size limited to the size of the model/mock-up. ☑ May be costly. ☑ May not be readily available. ☑ Can not be revised (Only replaced)
Overhead Transparencies. Overhead transparencies are presented using an overhead projector that projects images on a large screen or wall.	☑ Effective for presenting text, drawings, pictures, charts, diagrams, or graphs to large audiences. ☑ Easy to develop if handwritten or computer generated. ☑ Easy to produce ahead of time. ☑ Can be tailored during instruction. ☑ Students may write on their own for presentations. ☑ Instructor can maintain eye contact, and easy to use. ☑ Low in cost. ☑ Readily available.	☑ Can only used where there is source of electricity. ☑ Requires a large screen and projector.

Figure 2-18 Media Characteristics (continued)

MEDIA CHARACTERISTICS	ADVANTAGES	LIMITATIONS
Slides. Slides are presented using a slide carousel and projector that projects images on a large screen or wall.	☑ Effective for presenting still images of text, photographs, and graphics to large audiences. ☑ Ideal for enlarging images. ☑ Easy to develop if computer generated. ☑ Can be combined in any sequence. ☑ Instructor can maintain eye contact with students. ☑ Slide projectors are easy to use ☑ Easy to update, move, or rearrange.	☑ Slides can only be used where there is source of electricity. ☑ Requires a large screen. ☑ Projector must be monitored for overheating. ☑ Requires additional equipment (e.g.. slide carousel, extra bulb). ☑ Can be costly to develop if photos are developed into slides.
Audiotapes. Audiotapes are generally used in conjunction with other media (e.g. supplementing a slide presentation).	☑ Effective for self-paced instruction. ☑ Easy to use.	☑ Lengthy to develop. ☑ Costly to develop. ☑ Cannot be tailored during instruction. ☑ Requires a source of electricity and additional equipment (e.g. Audio Deck). ☑ Cannot be revised.
Videotapes/Film. Videotapes/film recreate or show footage of actual sites, events, procedures, equipment that is difficult or dangerous to observe in class (e.g. volcanic eruption).	☑ Effective for recreating actual events. ☑ Presenting correct method for performing a set of procedures. ☑ Reproduced at a low cost. ☑ Readily available from commercial sources. ☑ Easy to use.	☑ Generally requires a great deal of planning. ☑ They can not be tailored during instruction. ☑ Requires a source of electricity. ☑ Normally requires additional equipment (e.g. TV). ☑ Has a high initial development cost. ☑ Cannot be revised (copyright).

Figure 2-18 Media Characteristics (continued)

MEDIA CHARACTERISTICS	ADVANTAGES	LIMITATIONS
Computer Based Training (CBT). Computer based training utilizes the computer as an instructional device.	☑ Allows students varying levels of control over the rate and sequence of their learning. ☑ Provides immediate feedback. ☑ Provides reinforcement. ☑ Tracks student progress. ☑ Provides diverse learning experiences	☑ Educators and students have unrealistic expectations. ☑ Teaches only a limited range of interaction. ☑ Human interaction is reduced or completely eliminated. ☑ Start-up cost for both hardware and software can be very expensive. ☑ Software cannot be revised.
Interactive Video Disc (IVD) Computer based Interactive Video creates a multimedia learning environment that utilizes both video and computer-assisted instruction. the recorded video material is presented under computer control to viewers that see, hear sound, and make active responses. The video portion is provided through a videocassette, videodisc, CD-ROM, or DVD. The interactivity is provided through computers.	☑ Multimedia format. ☑ Learner interactivity. ☑ Individualization to learner needs. ☑ Very flexible. ☑ Can be used to provide simulation experiences.	☑ Very expensive to produce. ☑ Can be time consuming for the learner to search through frames. ☑ Start-up cost for both hardware and software can be very expensive. ☑ Software cannot be revised.
Compact Disc Interactive (CDI). CDI relies on a highly intelligent special player that is connected to a standard television or monitor. CDI incorporates text, audio, graphics and animation into the programs. The user interacts by using a remote controlled unit, and also has a joystick and activation buttons for interacting with the program. Sony Play station TM and Nintendo TM are examples of CDI.	☑ Easy to use. ☑ High quality sound and video. ☑ Easy to connect to home television set. ☑ Relatively inexpensive costing about as much as a VCR.	☑ Limited number of available titles and applications. ☑ Does not have a keyboard, or disc storage. ☑ Cannot be revised.
Virtual Reality (VR). Virtual reality is one of computer based technologies newest applications. It is three-dimensional environment where the user can operate as an active participant. VR provides the learner to interact with the environment in a unique way. Head mounted displays, gloves, joysticks, headphones are examples of types of equipment used to create the virtual experience.	☑ Creates a realistic world without subjecting viewers to actual or imagined dangers or hazards. ☑ Provides students with the opportunities to explore places not feasible in the real world (e.g. outer space or inside and active volcano).	☑ Very complex to use, thus does not lend itself to most classrooms. ☑ VR equipment tends to be expensive. ☑ VR software itself cannot be revised.

Figure 2-18 Media Characteristics (continued)

MEDIA CHARACTERISTICS	ADVANTAGES	LIMITATIONS
Interactive Multimedia Instruction (IMI). Interactive Multimedia Instruction systems incorporate the computer as a display devise, management tool, and/or source of graphics, pictures, text, sound into an interactive format through hypertext. The goal of hypertext is to immerse users into an interactive environment of sounds, still and motion images that are connected in diverse ways. Examples of IMI development programs are hyperstudio, Authorware, and Toolbook2.	☑ User can navigate through information by selecting routes via buttons, or hot spots that suit their personal needs and learning styles. ☑ User can also create their own special connections within the information. ☑ ICM is generally easy to revise.	☑ User can get lost in a hyperlink environment ☑ ICM can have lack of structure. ☑ Some programs can be difficult to use and are time consuming to produce. ☑ Ranges from moderate to very expensive for the more complex programs.
Computer Mediated Conferencing, Video Teleconference, Virtual Conferencing, Interactive Television, and Desktop Video Conferencing. All of these methods describe learning via telecommunications. These types of media formats permit cost-effective training to large numbers of people who may be disturbed across numerous sites.	☑ Real-time interactivity to large audiences in a cost efficient way. ☑ All television/computer systems allow the transmission. ☑ OD motion images and sound over a distance. ☑ Learners can communicate with the instructor and with each other via telephone or two-way video.	☑ The classroom used must be dedicated for two-way communications ☑ Can not generally be used for other purposes. ☑ Learners may feel isolated. ☑ Technical problems any interrupt instruction. ☑ Instructors may not feel comfortable using these mediums. ☑ Students may be reluctant to assume greater responsibility in this type of setting. ☑ Start up cost may be expensive depending on requirements. ☑ May not be available due to space constraints.

Figure 2-18 Media Characteristics

STEP 2

2. REVIEW MEDIA CONSIDERATIONS The type(s) of media selected should enhance the presentation of information and compliment the method of instruction, be available, and be able to be developed prior to the onset of the course. Curriculum developers weigh these factors and select the media for the course of instruction being taught. The following factors are considered and analyzed prior to selecting instructional media:

Factors that must be considered.

a. **Target Population Description:** Consider the abilities, education level, and learning preferences of the learner to select media that meets their learning preferences and abilities.

b. **Learning Objective**: Identify the learning domain addressed in the learning objective as either, Cognitive, Psychomotor, or Affective. Refer to Chapter 6, Adult Learning for more information on Domains of Learning.

c. **Class size:** Ensure the type of media selected compliments the size of the class. For the Marine Corps, in most situations: 1-9 students is considered a small class, 10 -20 students is a medium class, and over 20 students is a large class.

d. **Resources:** Money, time, scheduling, facilities, personnel, and equipment availability must also be considered to assess whether certain types of media are available, cost effective, and/or feasible to use.

e. **Learning Styles:** Consider that students will have different learning styles. Instruction is best when it accomodates visual, auditory, and kinesthetic learners. Refer to Chapter 6 Adult Learning for more information on Learning Styles.

STEP 3

3. Select Media After considering the target population description, learning objective, class size, resources and learning styles, select the media that best accommodates these factors.

STEP 4

4. Record Instructional Media The instructional media chosen is recorded on the Learning Objective Worksheet (LOW). The selected media is then recorded in MCAIMS for inclusion on the LOW which is part of the POI. For information on MCAIMS, see MCAIMs Users Manual.

SECTION 4

2300. SEQUENCE TERMINAL LEARNING OBJECTIVES (TLO)

Sequencing TLOs is the final process of the design phase and provides a foundation for developing course structure. Once this is completed, instruction is developed. The purpose of sequencing TLOs is to ensure the instruction promotes learning by the optimum placement of learning objectives. Sequencing TLOs provides the following benefits:

1. Efficiency Sequencing TLOs allows for an efficient system of instruction while avoiding duplication.

2. Transition Properly sequenced TLOs allow the student to make a logical transition from one skill or knowledge to the next while avoiding confusion. This ensures that supporting knowledge and skills are acquired before dependent subject matter is introduced.

3. Structured Learning Sequenced TLOs serve as a rough course structure and outline the strategy for instruction. This is important as it facilitates learning, particularly when introducing new concepts or material. This transfer of learning is maximized when closely related learning objectives are kept together.

2301. RELATIONSHIPS BETWEEN TLOS

To sequence TLOs, they are organized into broad categories. The relationships between them are determined and they are sequenced in the order implied by their relationship. Learning objectives do not necessarily have to be taught in the sequence they are listed. For instance, facilities and equipment may not be available for this. The organization provides the optimum sequence for learning, but it may not always be possible to instruct the course in this order.

1. Grouping TLOs Before TLOs are sequenced, they should be grouped. TLOs that deal with the same subject have a shared element relationship and may be grouped together. The shared element may be that of an object (e.g., ammunition, supply procedures, M16A2 rifle) or a condition (e.g., a desert environment, using a specific piece of equipment, nighttime).

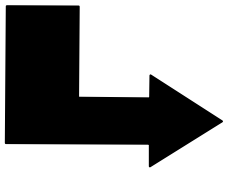
a. **Same Object** TLOs with the same object may be grouped together (e.g., all TLOs pertaining to the M16A2 rifle or all TLOs pertaining to a communications annex). Same object TLOs can often be determined by reviewing the Individual Training Standards (ITSs)/Training and Readiness (T&R) events, because all tasks are grouped by duty areas that define similarities among them. TLOs may be grouped by these same areas also. Grouping TLOs this way maximizes the transfer of learning because closely related TLOs are kept together.

b. **Same Condition** The environment and the resources within a school should be considered when grouping TLOs. TLOs may be grouped by like resources (e.g., all instruction requiring the use of a radio or all instruction that takes place on the firing range). Grouping learning objectives with the same condition maximizes instructional time (e.g., instructional time is not lost due to traveling from one location to another or due to obtaining the same equipment at different times throughout the course) allowing an efficient system of instruction.

2. Relationships in Sequencing To logically sequence TLOs, the curriculum developer must determine the relationship among them. The four most important relationships in sequencing TLOs are dependent, supportive, independent, and conflicting. They are described in detail below:

a. **Dependent Relationships** Dependent relationships exist between TLOs that are a prerequisite to other TLOs. Personnel must master the dependent TLO before they can master the others. Examples of actions having a dependent relationship are:

Examples of actions having a dependent relationship are:



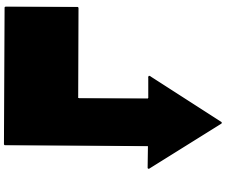
For a sniper to engage a target, he must first learn to apply the principles of marksmanship.

To send a message in Morse code, one must first learn to identify the Morse code symbols for each letter and number.

b. **Supportive Relationships** In supportive relationships, skills and knowledge in one TLO have some relationship to those in another TLO. The learning involved in mastery of one TLO transfers to the other, making learning involved in the mastery of the other easier. In a supportive relationship, TLOs are sequenced so that a logical transition can be made from one skill or knowledge to the next. This type of sequencing is largely dependent upon the Curriculum Developers expertise in the subject matter and subjective judgment of what makes the learning of a task easier. For example, "maintain a checkbook ledger" has a supportive relationship to "balance a checkbook." You could learn how to balance a checkbook without first learning to maintain a checkbook ledger. However, learning to maintain a ledger first will make balancing a checkbook much easier.

Other examples are:

Examples of actions having a supportive relationship are:



"Disassemble the M16A2 service rifle." Disassembling the M16A2 service rifle has a supportive relationship to the "assembly of the M16A2 service rifle."

"Drive a 1/4 ton truck." Driving a 1/4 ton truck has a supportive relationship to "drive a 5 ton truck."

"Write learning objectives." Writing learning objectives has a supportive relationship to "given learning objectives, write a lesson plan.

c. **Independent Relationships** In an independent relationship, skills and knowledge in one learning objective are unrelated to those in another TLO. For example, "balance a checkbook" has nothing to do with "selecting investments." Arrange TLOs with independent relationships in any reasonable sequence. However, they should not be placed between TLOs having dependent or supportive relationships. Examples of actions having an independent relationship are:

"Balance a checkbook" is independent of "select investments."

"Solve mathematical equations (general math, geometry, calculus)" is independent of "solve scientific equations (chemistry, physics)."

"Disassemble the M16A2" is independent of "disassemble the 9mm pistol."

d. **Conflicting relationships** Conflicting relationships exist between TLOs that involve opposite responses to the same cue in a different context. These responses must be clearly related to the situation in which the cue is received. The two actions should be taught together and the reason for the opposite response to the same cue explained and reinforced. The conflicting element that causes two very similarly stated TLO(s) to be conflicting usually involves a visual or auditory cue within the learning objective(s).

e. Remember to sequence the TLO(s) with conflicting relationships as close to one another as possible so that the conflicting issues/concerns can be addressed. Examples of conflicting elements presented in similarly stated actions are:

In the TLO "As a member of a platoon and on the command fall in, fall in platoon formation per the NAVMC 2691W/CH 1." This command could mean two distinctive different movements, depending on whether the platoon has weapons or not. You may want to teach these movements close to each other to show the major differences and make it clear to the platoon.

In the TLO "As a member of a platoon and on the command right face, execute a right face per the NAVMC 2691 W/CH 1," the same holds true depending on whether the platoon is armed. If the platoon is not armed, on the command of execution, "Face," the individuals in the platoon simply execute a right face. On the other hand, if armed, the individuals in the platoon have to execute trail arms, right face, and then order arms.

f. **Relationship Table** Not all actions fit neatly into one of the above categories. Some may seem to be both dependent and supportive. Other combinations may seem to be just as possible. The two things to remember are to have justification for the sequence and that in some cases the sequence can be changed. Sequencing decisions need to be documented to provide an audit trail. The table in Figure 2-19 summarizes the relationships between TLOs.

DEPENDENT	CONFLICTING	SUPPORTIVE	INDEPENDENT
Knowledge and skills in one TLO are closely Related to those in the other TLO.	Knowledge and skills in one TLO conflict in some respect with those in another TLO.	Knowledge and skills in one TLO have some relationship to those in the other TLO.	Knowledge and skills in one TLO are unrelated to those in the other TLO.
To master one of the TLOs it is first necessary to master the other.	Mastering one TLO may cause difficulty in mmastering the other TLO.	Mastering one TLO transfers to other, making learning Involved in the mastery of the other easier.	Mastering one TLO does not simplify mastering the other.
TLOs must be arranged in the sequence indicated by the knowledge and skills hierarchy.	TLOs must be taught closely together, directly addressing the conflicting elements between the two TLOs.	TLOs should be placed close together in the sequence to permit optimum transfer of learning from one TLO to the other.	In general, the TLOs can be arranged in any sequence without loss of learning efficiency.

Figure 2-19 Relationship Table

2302. STEPS FOR SEQUENCING TERMINAL LEARNING OBJECTIVES

The following are steps for sequencing TLOs:

1. Group the TLOs based on shared elements

2. Determine if the relationship between the TLOs is dependent, supportive, independent, or conflicting

3. Arrange TLOs based upon their relationship

a. Sequence the TLOs with **dependent relationships** in a hierarchical arrangement.

b. Sequence TLOs with **supportive relationships** in an order that permits the optimum transfer of learning from one learning objective to another.

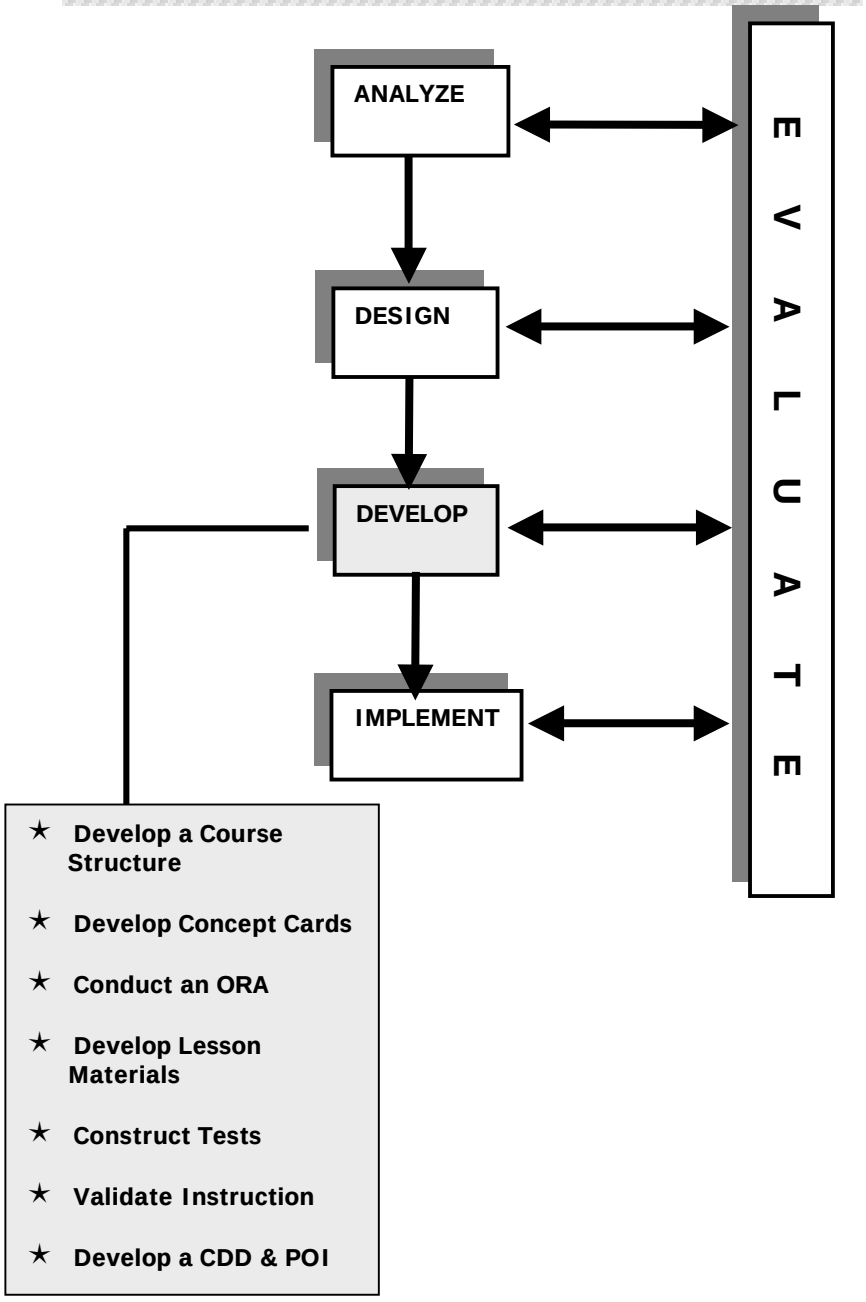
c. Sequence the TLOs with **independent relationships** in any logical order. Since the TLOs are independent of one another, the sequence in which they are presented will not affect learning. Remember that these TLOs stand-alone and should not be placed between dependent or supportive TLOs as this would disrupt the transfer of learning.

Sequencing TLOs is the final process in the Design Phase. The outputs of this phase are:

d. **TPD**
e. **Learning Objectives**
f. **Test Items**
g. **Method and Media**
h. **Sequenced TLOs**

These outputs become the inputs to the Develop Phase that begins with developing course structure.

DEVELOP PHASE



In Chapter 3:

Chapter 3

3000. INTRODUCTION

The Develop Phase of the Systems Approach to Training (SAT) process builds on the outputs of the Design Phase to produce Course Descriptive Data (CDD)/ Program of Instruction (POI) and the Master Lesson File (MLF).

This chapter is broken down into the following eight sections:

1. **Develop A Course Structure** The course structure is a detailed chronological document identifying the implementation plan for a course.
2. **Develop Concept Cards** Academic and administrative concept cards are created to assign resources within the formal school/detachment to lessons, evaluation, and events.
3. **Conduct an Operational Risk Assessment (ORA)** An ORA will be conducted on each lesson/event within a Program of Instruction (POI). The associated ORA tools will be incorporated into the Master Lesson File (MLF).
4. **Develop Lesson Materials** Lesson plans, student materials, supplemental student materials (optional), media, the Instructor Preparation Guide (IPG), are all lesson materials to be used during the Implement Phase.
5. **Construct Tests** Constructing a test involves selecting and placing the test items from the Learning Objective Worksheet (LOW) on the appropriate test. It also involves providing ample instructions to the student, instructions to the evaluator, and developing the grading criteria for each test given in the course.
6. **Validate Instruction** The goal of validation is to determine the effectiveness of instructional material prior to implementation.
7. **Develop Course Descriptive Data (CDD) and Program of Instruction (POI)** The CDD provides a summary of the resources required to administer a course and the POI provides a detailed description of the course. These documents record the formal school's plan for satisfying the training requirements listed in the Individual Training Standard (ITS) or Training and Readiness (T&R) order.
8. **Assemble A Master Lesson File** One Master Lesson File (MLF) is compiled for **EVERY** class taught at the formal school/detachment in order to provide continuity of instruction.

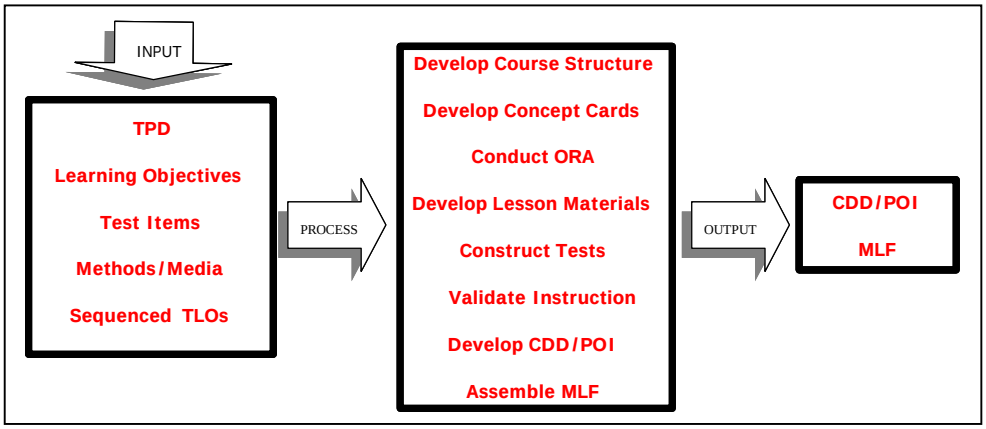


Figure 3-1

SECTION 1

3100. DEVELOP COURSE STRUCTURE

The purpose of developing course structure is to determine how much content is appropriate for a single lesson or a single exam and arrange the lessons and exams in a logical sequence. The course structure provides an outline of how the lessons in the course will flow from start to finish. Course structure is not a course schedule. However, the course structure provides a guideline for developing the course schedule. A course structure contains lesson titles, methods, academic hours, and lesson designators.

3101. STEPS FOR DEVELOPING COURSE STRUCTURE

The four steps for developing course structure are: review source materials, determine lesson/exam content, estimate instructional hours, and assign lesson/exam titles and designators.

1. Review Source Material The **first step** in developing course structure is to review the following items:

STEP 1

a. The Learning Objective Worksheets (LOW) for the course that contains the Terminal Learning Objectives (TLO) and their associated Enabling Learning Objectives (ELO), the delivery system, and test items.

b. Directives from higher headquarters that may influence the length of the course.

c. School Standing Operating Procedures (SOP) for any additional school academic requirements that may affect the course.

2. Determine Lessons/Exam Content The **second step** in developing course structure is to decide how many objectives are appropriate for a single lesson or exam. There is a process used to determine lessons/exams.

STEP 2

See The Process of Determining Lesson/Exam Content on the next page:

Process of Determining Lesson/Exam Content

a. **Review Objectives** When reviewing the objectives, consider the following:

1) **The complexity of an objective.** If it is lengthy or technical, the lesson may need to be divided into several lessons.

2) **The domain of the objective.** In general, objectives in the cognitive domain require fewer resources to teach. Several cognitive objectives may be reached during one lesson. However, an objective in the psychomotor domain can require more methods and more resources. Therefore, it may require more than one lesson.

3) **Select closely related objectives.** If multiple objectives are chosen for one lesson, select those objectives that are closely related. When combined, they must make a logical, self-contained group suitable for an individual lesson.

a) Learning objectives are organized so that the group has a natural beginning and ending point.

b) Look for "natural breaks" in the sequenced learning objectives that indicate major changes in subject matter (e.g., changing from one system to another or going from knowledge-based instruction to performance-based instruction.)

b. **Consider Target Population Description (TPD)** The level of experience the average student will bring into the classroom must be considered. Due to their lack of experience, entry-level students may not be able to comprehend multiple objectives in a single lesson. Remember that the students are seeing it for the first time.

c. **Assign Lesson/Exam Titles** All lessons and exams are assigned titles (i.e., Perform Preventive Maintenance on the M16A2 Rifle). The titles must be meaningful and relate to the lesson or exam content.

3. Estimate Instructional Hours An estimate of the hours required for each lesson is necessary to ensure that the proposed curriculum does not exceed the maximum training days authorized for the course. Academic time includes all hours devoted to instruction, review, evaluation, and re-testing of the TLOs/ELOs. Some other non-academic events, such as course overview, end of course critiques, or training aid maintenance, should be included in this estimate. All other events not directly related to the structure of the course are administrative in nature and not considered when building course structure. If the estimate exceeds the maximum authorized training days, the school/detachment must contact CG, TECOM (GTB/ATB) for guidance. When estimating instructional time, consult and review the following:

See How to Estimate Instructional Hours on the next page:

a. Time requirements for similar lessons in other approved courses. This will give you an estimate of how long it may take to teach your lesson.

b. The number and complexity of learning objectives within each lesson. A learning objective's complexity is based upon whether its behavior is knowledge-based or performance-based, what conditions must be present, and how the behavior is evaluated.

Steps for Estimating Instructional Hours

c. The amount of time spent performing the task on the job. Normally, teaching a task takes longer than performing it on the job.

d. Review the instructional method selected for each learning objective. For instance, performance-based instruction with practical application will take longer to conduct than a lecture.

e. Total the number of hours and divide by 8 (the maximum number of training hours per day under peacetime training conditions). This will provide the estimated number of training days for the course.

f. Then review approved Course Descriptive Data (CDD) or CG, TECOM development directive. The CDD or directive will state the training days authorized for the course.

4. Assign Lesson/Exam Titles and Designators These codes are a quick way to identify a lesson or exam. Designators must be purposeful, relate to the lessons, and numbered sequentially. They can be written in any format, provided they are meaningful (e.g., TBS.1 for Lesson 1 of The Basic School Course; BIC.10 for Lesson 10 of the Basic Infantryman Course). School SOP will provide guidance for the assignment of designators. Further, the rationale for assigning lesson/exam designators is located in Section IV of the POI. See the MCAIMS User's Manual for further explanation. Figure 3-2 Below is a sample course structure.

SAMPLE COURSE STRUCTURE

TD-1 Lesson	Method	DESIG	Est Hours
_____SAT Overview	__L	IT-00	1.5
_____ Effective Comm	__L/D/PA/G	IT-01	2.5
_____Effective Comm Exam	X (W)	IT-04	1
_____Conduct a Lesson	L/D/PA/G	IT-04	2
_____Conduct a Lesson Exam	X (P)	IT-08	1

Figure 3-2

Refer to Chapter 7, Administration for guidance on how to use the Course Structure to produce a Course Schedule.

3200. DEVELOP CONCEPT CARDS

SECTION 2

A concept card is a document that gives the reader a snapshot of one entire lesson, exam, or event during a course of instruction. It identifies all of the learning objectives, instructional methods and media, and the resources required to conduct the entire lesson, exam, or event. Concept cards have both a primary and a secondary purpose. The primary purpose is to provide the school with a way to manage its resources. The secondary purpose of a concept card is to document the formal school/detachments plan for implementing the ITSs. Concept cards make up the bulk of Section IV of the Program of Instruction (POI) and are produced in MCAIMS. A concept card must be produced for each lesson, exam, and administrative event for inclusion in the Master Lesson File (MLF).

A Concept Card must be produced for inclusion in the Master Lesson File (MLF)

3201. CATEGORIES OF CONCEPT CARDS

There are two categories of concept cards: **Academic and Administrative**.

1. Academic Concept Card There are three specific types of academic concept cards: Lesson Purpose, Task Oriented, and Exam.

a. **Lesson Purpose** Lesson purpose concept cards are created when the instructional content is not specifically related to a task list (ITS) for the course and does not address any TLOs/ELOs. The lesson purpose concept card will have a clearly defined lesson purpose statement reflecting the rationale for presenting the lesson (i.e., orientation or overview).

Three specific types of academic concept cards

b. **Task Oriented** Task oriented concept cards identify the instructional content as it relates to at least one task within the task list for the course. They address one or more TLO(s) and their associated ELOs being taught.

c. **Exam** Exam concept cards capture the resources required for the evaluation of at least one task within the task list (ITS/T&R Event) for the course. One exam concept card is created for each initial exam administered over the course of instruction. Retesting is a remedial action available to school commanders but must be accomplished with resources provided for the course. The remediation hours and resources required for any retests are captured in an administrative concept card. These hours do not go toward the 40 hour training week. Exceptions to this policy may be authorized by CG TECOM.

Every task oriented/exam concept card will have the TLO or associated ELOs that the lesson/exam supports.

2. Administrative Administrative concept cards capture all of the non-instructional information required to conduct the course. An example would be the graduation ceremony upon completion of a course. Administrative concept cards are found in Annex Z of the POI.

3202. CONCEPT CARD ELEMENTS

MCAIMS is the program used by the Marine Corps to record all elements of the concept card. See APPENDIX B for a sample paper-based Concept Card. See MCAIMS User's Manual for instructions for recording in MCAIMS. The elements of a concept card are:

MCAIMS will indicate the date printed in the upper right hand corner.

1. **Heading** The information in the heading will include the name of the course, letter of the annex, and the title of the annex .

Annexes A through Y are reserved for academic concept cards (task oriented, lesson purpose or exam).

2. **Annex** Annexes are established with an alpha designator to represent subject areas into which concept cards are grouped. They may be established according to the duty areas by which ITSs/T&R events are organized or according to some other logical grouping. Annexes A through Y are reserved for academic concept cards (task-oriented, lesson purpose or exam). Exam concept cards may be assigned to the same annex in which the related task oriented cards appear or may be assigned a separate annex of their own. Annex Z is reserved exclusively for administrative concept cards.

3. **Lesson, Exam, Event ID** The lesson, exam, or event ID is assigned during the development of the course schedule and is recorded here.

4. **Lesson, Exam, Event Title** The lesson, exam, or event title is assigned during the development of the course schedule and is recorded here.

5. **Hours (Total)** The total amount of time required to conduct a lesson, event, or exam is reflected here. This is automatically calculated within MCAIMS based on the total of hours allocated to individual methods. See hours (per method) below.

6. **Method** Instructional methods selected during the design phase and recorded on the LOW are assigned to the concept card. This is done not only for quality control, but also as a quick reference. The method is recorded as a code or abbreviation.

7. **Hours (per method)** The overall time for the lesson is broken down to reflect how much time is allotted for each of the selected methods.

8. **Student Instructor (S:I) Ratio** The student instructor ratio is determined so that it complements the selected method. For example, a ratio of 30:1 (students :instructor) would be appropriate for a lecture. During practical application where additional instructors are required for closer supervision of the students, a 6:1 or 30:5 ratio might be necessary. The difference in these two ratios is determined by how the practical application exercise is actually conducted. Are the students and instructors working in a small group, or are additional instructors merely added to the classroom for additional control? Mathematically, MCAIMS will treat the ratios the same for the Instructor Computation Worksheet (Lockstep). Curriculum developers must remember the concept card provides a "snapshot" of what is actually transpiring in the classroom. (See concept card section of the MCAIMS Users Manual for specific guidance).

9. **Media** Media that were selected during the design phase and recorded on the LOW are assigned to the concept card. This is done not only for quality control, but also as a quick reference. The media are recorded as a code or abbreviation.

10. **Learning Objectives** On task oriented or exam concept cards, the learning objectives included in the lesson for that task are recorded.

11. **Lesson Purpose** A detailed lesson purpose statement will replace the learning objectives on a Lesson Purpose Concept Card.

12. **Ammo Requirements** Those learning objectives requiring ammunition for instruction and evaluation must have the Department of Defense Identification Code (DODIC) and nomenclature for each ammunition type used. This information can be found in MCO P8011.4H Marine Corps Table of Allowance for class V (w) material (peacetime). The DODICs are broken down by the number of rounds per student, expended and unexpended, during the execution of the lesson. The number of support rounds, expended and unexpended, are also recorded by DODIC.

(DODIC) - Department of Defense Identification Code

Notes. This section can be used to provide a word picture describing the execution of the class, exam, or event. It can be used to capture, in detail, any information that clarifies additional instructional and resource requirments such as:

Any logistical requirements identified on task oriented concept cards will be transposed to the Instructor Preparation Worksheet.

a. Safety (e.g., Highest initial and residial Risk Assessment Codes [RAC])
b. Justification of exam method
c. Instructor ratios (e.g., justification of additional instructors for different methods and safety)
d. Logistical requirements (e.g., requests for transportation, ammunition, or ranges, etc.)
e. External personnel support (e.g., corpsman, RSO, contractors, guest lecturers)
f. External facilities (e.g., pool, laboratories)
g. External equipment support (e.g., helicopters, computers, radios, tanks etc...)

13. **References** References are source documents that include doctrinal publications, technical manuals, field manuals, and Marine Corps Orders. These references provide guidance for performing the task in accordance with the given conditions and standards.

14. **Signature Blocks** MCAIMS allows names or titles of up to five officials to be entered on the concept card for the purpose of routing/approval. Routing and approval procedures are normally found in the formal school/detachment SOP.

15. **Optional Items** Phase and group designators are optional elements that can be entered to identify certain timeframes or instructional teams responsible for specific instruction during implementation of the POI. For example, Recruit training has Forming, 1st, 2nd and 3rd Phase. During 2nd phase Weapons and Field Training Battalion (WFTB) is responsible for the instruction of marksmanship skills.

SECTION 3

3300. CONDUCT AN OPERATIONAL RISK ASSESSMENT (ORA)

The formal school/detachment conducts an Operational Risk Assessment (ORA) on all events, lessons and exams. The concept of Risk Management formalizes the process of training safely and efficiently. Rather than relying solely on individual experience to achieve the best results, risk management provides careful analysis and control of hazards in each lesson.

3301. STEPS FOR CONDUCTING AN ORA

There are two circumstances when a curriculum developer will conduct an Operational Risk Assessment (ORA). An ORA is either going to be conducted on a new lesson or an existing lesson. In either case, the decisions for conducting an ORA must be based upon well documented facts about the lesson.

When conducting an ORA on an existing lesson, there is more information to work with, such as test results, After Instruction Reports (AIR) and even mishap reports. For a lesson under development, the initial ORA is conducted once the concept card is completed. The concept card provides what will be taught (objectives), which methods will be used, and what forms of media will support the lesson. There may also be important information about ammunition and other support requirements that by their nature have associated hazards. Based on information from the concept card and other references, the initial ORA is completed. This enables the curriculum developer to proceed with developing the lesson materials while considering the related hazards and identified controls. By conducting the ORA at this point, safety measures can be incorporated into the lesson plans and related documents. Therefore, risks to personnel (students, instructors, etc.) is minimized even before the first validation of the lesson. It's important to understand that this will be the **initial** ORA and that it is necessary to review, update, and finalize the ORA after validation.

The steps for conducting an ORA are as follows:

1. **Identify hazards.**
2. **Assess hazards.**
3. **Make risk decisions.**
4. **Implement controls.**
5. **Supervise.**

1. Identify Hazards Identifying hazards is the most important of the five steps in an Operational Risk Assessment. Failure to recognize a hazard means that a control measure will not be developed and implemented. As a result, the hazard could negatively impact training. This is the most time-consuming step in the ORA. Time and resources must be spent wisely to identify all hazards associated with a lesson.

There are four sub-steps that must be completed to effectively identify hazards:

a. **Gather resources.**
b. **Identify the major steps (learning objectives).**
c. **Identify sub-steps (skills).**
d. **Identify hazards.**

a. **Gather Resources** There are several resources that may be used to assist in conducting this analysis. Because identifying hazards is so critical, use all resources that are available. Some suggestions are:

1) References References, especially technical manuals, often include warning statements or icons that warn the user of a hazard. They can also help identify hazards associated with the sub-steps.

2) The Master Lesson File The LAW will definitely help in identifying the sub-steps. The LOW will provide visibility of the test items that may have hazards associated with them. The concept card lists the learning objectives which may be considered as the major steps associated with a lesson or exam. The concept card will also list the major steps for an event (e.g., physical training, graduation). Methods and media used for the lesson are identified on the concept card and may have associated hazards. A lecture about using explosives obviously has fewer hazards than a demonstration. Likewise, a video of an explosion has less risk than observing an actual demolition. When conducting an ORA on an existing lesson, it is also necessary to review the lesson plan, student outline and media for reference to possible hazardous situations.

3) School SOP/Orders These documents can provide guidance (like actions during incement weather) that will act as controls. It may also spell out who has authority to make risk decisions at different levels.

4) An ORA Worksheet (ORAW) The ORAW is used to record the results of an Operational Risk Assesment. It's helpful to obtain an electronic copy of the ORAW, since the columns are small and hard to handwrite all of the information in a column.

5) A Subject Matter Expert (SME) An SME is someone who has thorough knowledge of a particular job. It's important to remember that the "operation" that is being analyzed is a training operation in a formal school. It's not just an experienced job holder that is needed, but one who has experience teaching. In this case, an SME is an instructor who has taught the lesson being analyzed or a similar lesson.

6) Data from past classes. If conducting an ORA on an existing lesson, data can be gathered by interviewing graduates, studying test results, and reviewing mishap reports. This can reveal hazards not found elsewhere. Data and points of contact for former students can be found in the course books or other course records.

b. **Identify the Major Steps** To identify the major steps in a lesson, begin by looking at the learning objectives on the concept card. Both the terminal and enabling learning objectives are the major steps in the lesson. Record the major steps in the column labeled "Major Steps" on the ORAW. It's not necessary to record more than the behavior statement from the learning objectives. If an ORA is being conducted on a "lesson purpose" lesson (lesson with no learning objectives), identify the major steps by reviewing the lesson plan. The major steps are the main points of the lesson.

Figure 3-3. ORAW with Major Steps listed.

OPERATIONAL RISK ASSESSMENT WORKSHEET
Formal School/Detachment

SCHOOL:		COURSE:				
LESSON TITLE:		LESSON DESIGNATOR:				
PREPARED BY:		DATE:				
IDENTIFY HAZARDS				MAKE RISK DECISIONS	IMPLEMENT CONTROLS	SUPERVISE
List LO Behaviors	Sub-Steps	List Hazards		Develop Controls	How to Implement	How to Supervise
Change a Flat tire. Jack up Car						
Course Training Criteria (CTC):	1.					
Approving Signature:			Date:			

Page ___ of ___

c. **Identify Sub-Steps** To determine what hazards exist, the major steps must be broken down into sub-steps. If the lesson is being conducted solely by lecture, there are probably no hazards. Demonstrations are normally safe for the students, but may expose the demonstrator to hazards. A practical application will expose all personnel to hazards. Keep the methods in mind when determining the sub-steps. The sub-steps can be determined by consulting the SMEs, reading a technical manual or other publication, or reviewing knowledge, skills, and attitudes from the LAW. For example, if a major step is to jack up a car, the sub-steps would be: (1) remove the jack, (2) place jack under the car, and (3) raise the vehicle. This information is readily available by researching the references or the LAW. The SME can add important details, like describing the instructional environment or how training sub-steps are different from real-world performance. This type of information can only come from an SME; it's not in the books! Record the sub-steps in the column labeled Sub-steps on the ORAW.

OPERATIONAL RISK ASSESSMENT WORKSHEET
Formal School/Detachment

SCHOOL:		COURSE:	
LESSON TITLE:		LESSON DESIGNATOR:	
PREPARED BY:		DATE:	

IDENTIFY HAZARDS				MAKE RISK DECISIONS		IMPLEMENT CONTROLS	SUPERVISE
List LO Behaviors	Sub-Steps	List Hazards		Develop Controls		How to Implement	How to Supervise
Change a Flat tire. Jack up Car	Remove the jack Place jack under Car Jack up Car						
Coast Training Criteria (CTC):	1.						
Approving Signatures:				Date:			

Page ___ of ___

Figure 3-4. ORAW with Sub-Steps listed.

d. Identify **Hazards** To identify hazards, look at each sub-step and ask the question, "What could happen while performing this sub-step that may cause lesson failure, injury to the student, or damage to property?" Here are some resources to help answer this question:

1) Technical publications
2) SME
3) Concept card
4) Lesson Plan (if developed)
5) AIRs and IRFs
6) Mishap reports

Technical publications often contain warnings about hazards. Consider if this warning is applicable to the training environment, and if so record it. An SME who has taught the lesson (or a similar lesson) before can help also. That SME will know intricate details of the sub-step that will help identify all hazards. Interview the SME to determine details about the training, such as mistakes that students often make. This will allow the curriculum developer to plan for potential mistakes by developing a control to manage the hazard. Consider not just the sub-steps, but also the method of instruction. If an SME is not available, determine how the lesson will be taught by looking at the concept card. If conducting an ORAW on an existing lesson, the lesson plan will provide information in more detail than the concept card. Record the hazards associated with each sub-step in the column labeled List Hazards on the ORAW.

Figure 3-5. ORAW with Listed Hazards.

OPERATIONAL RISK ASSESSMENT WORKSHEET
Formal School/Detachment

SCHOOL:		COURSE:	
LESSON TITLE:		LESSON DESIGNATOR:	
PREPARED BY:		DATE:	

IDENTIFY HAZARDS				MAKE RISK DECISIONS		IMPLEMENT CONTROLS	SUPERVISE
List LO Behaviors	Sub-Steps	List Hazards		Develop Controls		How to Implement	How to Supervise
Change a Flat tire.							
Jack up Car	Remove the jack	N/A					
	Place jack under Car	N/A					
	Jack up Car	Car might fall	3				
Course Training Criteria (CTC):		1.					
Approving Signature:				Date:			

Page ___ of ___

2. Assess Hazards A hazard is defined as a condition that can impair mission accomplishment, but it does not indicate to what extent. The risk associated with a hazard is quantified by using the Risk Assessment Code Matrix. The matrix is used as a tool to assess the severity and probability of each hazard and to assign a Risk Assessment Code (RAC).

STEP 2

a. **Assess the level of Severity of the Hazard** (Level I, Level II, Level III, and Level IV) The severity is defined as the potential degree of injury, illness, property damage, loss of assets (time, money, personnel), or effect on mission. If the hazard does occur, how bad will the damage be? This data may be found by reviewing mishap reports from the school and units, if available. If not, use the worst, realistic case that could possibly happen. Hazard severity categories are assigned as Roman numerals according to the following criteria:

Category I – The hazard may cause death, loss of facility/asset or result in grave damage to national interests.

Category II – The hazard may cause severe injury, illness, property damage, damage to national or service interests or degradation to efficient use of assets.

Category III – The hazard may cause minor injury, illness, property damage, damage to national, service or command interests or degradation to efficient use of assets.

Category IV – The hazard presents a minimal threat to personnel safety or health, property, national, service or command interests or efficient use of assets.

b. **Assessing the Probability of the Hazard** (LIKELY to happen, PROBABLY will happen, MAY happen, OR UNLIKELY to happen) What is the chance the hazard will occur? Again, use available data or make a realistic estimate. Mishap probability will be assigned an English letter according to the following criteria:

Sub-category A – Likely to occur immediately or within a short period of time. Expected to occur frequently to an individual item or person or continuously to a group.

Sub-category B – Probably will occur in time. Expected to occur several times to an individual item or person or frequently to a fleet, inventory or group.

Sub-category C – May occur in time. Can reasonably be expected to occur some time to an individual item or person or several times to a group.

Sub-category D – Unlikely to occur.

c. **Risk Assessment Code –** The RAC is an expression of risk that combines the elements of hazard severity and mishap probability. Using the matrix shown below, the RAC is expressed as a single Arabic number that can be used to help determine hazard abatement priorities.

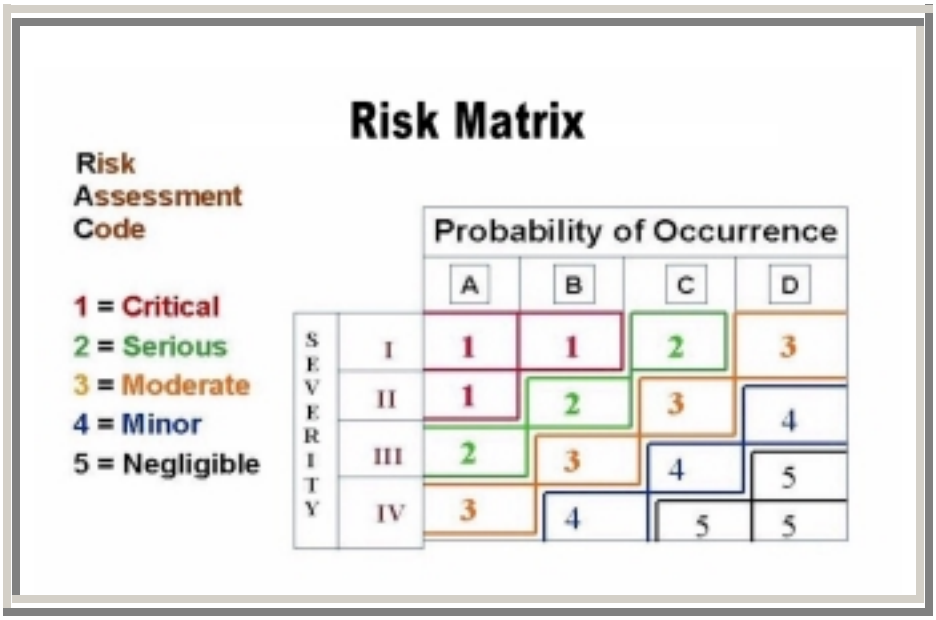


Figure 3-6. Risk Matrix

Find the Intersection of the Severity Row and the Probability Column. This is the RAC. Record this RAC on the ORAW in the column labeled "Initial RAC."

STEP 3

3. Make Risk Decisions When presented with risks in a lesson, a decision must be made as to whether the benefits of the lesson outweigh the risk. Before considering this, an effort must be made to control the risk. Risk controls are designed to change risk by lowering the probability of occurrence and/or decreasing the severity of a risk.

a. **Begin by Focusing on the Hazards that Have the Highest RAC** If it is determined that a hazard with a high RAC cannot be minimized, then a decision to not conduct the training at all may be made. In this case, time and resources are not expended on analyzing hazards with low RACs.

b. **Decide if the Benefit of the Training Outweighs the Risk** If the controlled risk outweighs the benefit, the decision-maker may still choose to accept the risk.

c. **Select a Control Measure** Look at different ways to work with the risk in order to mitigate it to the lowest level possible. There are many decisions that can be made on how to handle the associated risk. Ensure those controls will allow the learning objectives to be met. Some options are listed below:

1) Accept the Risk There will always be a risk level associated with any hazard; however, there are acceptable levels of risk. For hazards where the risk level is low or when the benefits outweigh the possible costs for higher risks, the decision may be made to accept the risk. When training reconnaissance Marines, trainers must accept some of the risk.

2) Reduce the Risk This is the most widely used variety of risk control. Look at all available resources (e.g., SMEs, technical manuals, safety officer) when developing controls.

3) Avoid the Risk Avoiding the risk requires canceling or delaying that portion of the lesson, but this option is rarely used due to the importance of the lesson. Sometimes it may be possible to avoid a risk by going around the risk, or performing the operation in a different way. Pilot trainees avoid the risk of crashing by doing much of their training in a simulator.

4) Compensate for the Risk Creating a redundant capability may compensate the risk under certain circumstances. A driving instructor often has two brake pedals in a training car. If the student fails to stop, the redundant brake pedal gives the instructor control, thus reducing the risk.

5) Delay the Risk The risk may be delayed for a couple of hours or day if need be to reduce the severity and probability of the risk. A force march at a school could be delayed during inclement weather, for example.

6) Spread the Risk Risk is commonly spread out either by increasing the exposure distance or by lengthening the time between exposures to an element. By spreading the distance, exposure, or other means, the chance of the risk happening is diluted equivalently, and the severity may be decreased proportionately as well.

7) Transfer the Risk When the possible losses or costs are shifted or transferred to another entity, the risk to the original individual or organization may be either greatly decreased or eliminated altogether.

8) Reject the Risk A decision to reject the risk may be made when the risk exceeds the lesson benefits. Sometimes, rejecting a risk at the curriculum developer level may mean that someone else at a higher level will have to reconsider the risk.

d. **Record Controls on the ORAW** Once the best control has been determined, record the results on the ORAW in the column labeled Develop Controls. Reassess each RAC with the selected control in place. Since a control should reduce the severity, probability, or both of a hazard, the residual RAC is probably lower than the original one. Record the resulting lower RAC on the ORAW in the column labeled "Residual RAC."

e. **Provide Cease-Training Criteria** A special type of control is the Cease-Training Criteria (CTC). Instructions for Cease Training must be included when there is potential for serious injury or damage to equipment. CTC is a pre-determined circumstance where training must be stopped to avoid a serious incident. A list of the criteria is recorded on the ORAW. These criteria are also recorded during the introduction of the lesson plan, so that the instructor can brief the class on the CTC, how training is stopped, and how training can resume. Specific procedures on resuming training may be found in the formal school/detachment SOP.

OPERATIONAL RISK ASSESSMENT WORKSHEET
Formal School/Detachment

SCHOOL:		COURSE:	
LESSON TITLE:		LESSON DESIGNATOR:	
PREPARED BY:		DATE:	

IDENTIFY HAZARDS				MAKE RISK DECISIONS		IMPLEMENT CONTROLS	SUPERVISE
List LO Behaviors	Sub-Steps	List Hazards		Develop Controls		How to Implement	How to Supervise
Change a Flat tire.							
Jack up Car	Remove the jack	N/A					
	Place jack under Car	N/A					
	Jack up Car	Car might fall	3	Check tire Jack placement Level Ground Yellow line	4		
Cease Training Criteria (CTC):		1.					
Approving Signature:				Date:			

Page ___ of ___

Figure 3-7. ORAW with Risk Decisions.

f. **Risk versus Benefit** Once the control measures have been selected, it is time to make risk decisions. Analyze the overall level of risk for the lesson with the selected controls in place. Decide if the benefits of the lesson outweigh the reduced level of risk. If the risk level is still too high for the benefits, a decision to continue or discontinue training must be made at the proper level.

g. **Identify the Proper Level of Decision Making** The person at the right decision level must be able to effectively oversee implementation of these controls. Once this is known, making control decisions involves two components:

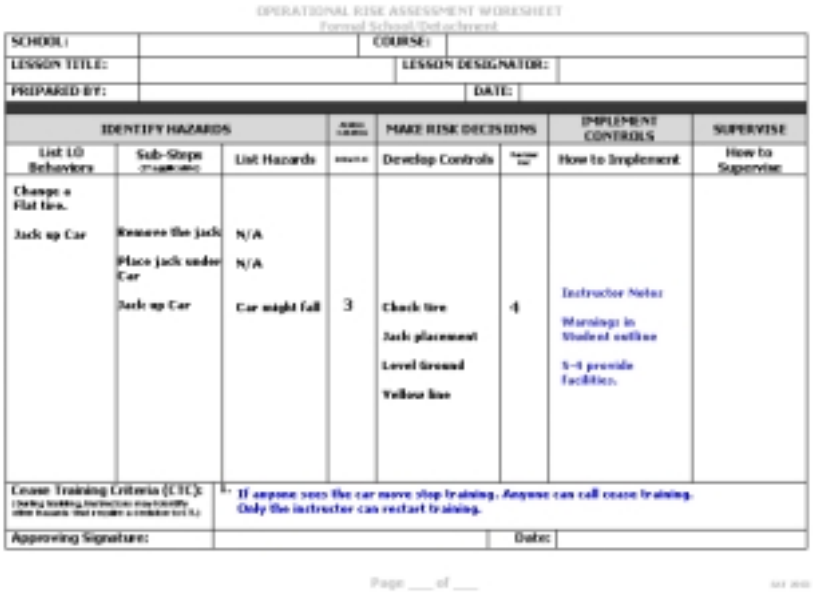
1) Which controls to implement. Exercise those controls that will reduce the lesson risk to an acceptable level.

2) How much can be spent. Consider the cost of resources needed to implement the control.

4. Implement Controls Once the risk control decision is made, resources must be available to implement the specific controls. There are four things that must be accomplished in this step, they are:

STEP 4

a. **Record the Instructions** Record how to implement the controls on the ORAW in the column labeled "How to Implement." For example, if the control for an eye hazard is to wear impact-resistant safety goggles, record who will make that happen (probably the instructor), when they will do it, etc. The idea is to explain who, what, when, where, and how of implementing the control. Record that information in this column.



OPERATIONAL RISK ASSESSMENT WORKSHEET

SCHOOL:			COURSE:				
LESSON TITLE:			LESSON DESIGNATOR:				
PREPARED BY:			DATE:				
IDENTIFY HAZARDS				MAKE RISK DECISIONS		IMPLEMENT CONTROLS	SUPERVISE
List LO Behaviors	Sub-Steps	List Hazards		Develop Controls		How to Implement	How to Supervise
Change a Flat tire.							
Jack up Car	Remove the jack	N/A					
	Place jack under Car	N/A					
	Jack up Car	Car might fall	3	Check tire Jack placement Level Ground Yellow line	4	Instructor Note: Warnings in Student outline S-4 provide facilities.	
Cease Training Criteria (CTC):		1. If anyone sees the car move stop training. Anyone can call cease training. Only the instructor can restart training.					
Approving Signature:					Date:		

Page ___ of ___

Figure 3-8. ORAW with Implement Controls and CTC.

b. **Make Implementation Plan Clear** The implementation plan for providing the necessary controls must be clear and concise. For example, if safety goggles are listed as a control, be sure to include information like who will get the goggles, who will maintain them, instructions for inserting notes about wearing them in the lesson plan or student materials, etc.

c. **Establish Accountability** All key players must know what they are responsible for and be held accountable for their part of the plan. Establish accountability by writing specific names or billet titles on the ORAW. Accountability for the entire plan is also established in the "Approving Signature" block.

d. **Provide Support** The formal school/detachment must provide support to the people helping accomplish the plan.

5. Supervise The fifth and final step of the Operational Risk Assessment involves determining the efficiency and effectiveness of risk controls throughout the operation. Supervision requires the monitoring of risk control implementation to ensure that all controls are implemented as planned. Any ineffective controls are detected and corrected. Any unforeseen hazards are recorded and controls developed.

STEP 5

a. **Document the Supervision Plan** Explain the details of the supervision plan on the ORAW in the column labeled "How to Supervise." These plans should include details on how the instructor is to supervise the students.

b. **Supervise the Implementation** There are many ways to evaluate if the plan created is functioning the way it was intended to. Some of the ways are through the After Instruction Report (AIR), End of Course Critiques (ECC) and by observing the lesson being taught. To ensure effectiveness, ask "Does the plan work?" or "Are the controls working and are they effective?" If not, what needs to be changed?

c. **Decide a Course of Action** Review the cost/benefit balance. Based on the data reviewed from supervision efforts, there may be some things that need to be changed to make the plan more effective.

d. **Document the Changes** Any changes in the original plan must be documented. All changes must be made clear to everyone involved in the course, such as the course chief, instructors, etc. Finish the ORAW by having the proper authority sign the ORAW in the "Approving Signature" block.

OPERATIONAL RISK ASSESSMENT WORKSHEET
Formal School/Detachment

SCHOOL:				COURSE:			
LESSON TITLE:				LESSON DESIGNATOR:			
PREPARED BY:				DATE:			
IDENTIFY HAZARDS				MAKE RISK DECISIONS		IMPLEMENT CONTROLS	SUPERVISE
List LO Behaviors	Sub-Steps	List Hazards		Develop Controls		How to Implement	How to Supervise
Change a Flat tire. Jack up Car	Remove the jack Place jack under Car Jack up Car	N/A N/A Car might fall	3	Check tire Jack placement Level Ground Yellow line	4	Instructor Notes Warnings in Student outline S-4 provide facilities.	Instructor supervise proper placement of jack. Use classroom observation reports. Monitor AIR's, IDP's and safety reports.
Cease Training Criteria (CTC):	If anyone sees the car move stop training. Anyone can call cease training. Only the instructor can restart training.						
Approving Signature:	John M. Marine, Maj, USMC			Date:	20020807		

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Figure 3-9. Approved ORAW.

SECTION 4

3400. DEVELOP LESSON MATERIALS

The purpose of developing instruction is to generate the lesson plans, student outlines, supplemental student material, media, and an Instructor Preparation Guide (IPG) to support the training. Curriculum developers must create materials that support student learning and complement instruction. Real world relevance is the key in the development of lesson materials to maximize the transfer of learning from the instructional setting to the job. Relevance dramatically increases the student's motivation to learn and retain those skills that will help in the performance of the job. The steps in developing lesson materials include securing resources, writing the lesson plan and student materials, developing the media, and creating an Instructor Preparation Guide.

3401. SECURE RESOURCES

LOW – Learning Objective Worksheet.

The development of instructional materials begins with acquiring all the resources necessary for instruction. A final review of the concept card for the lesson needs to be made to ensure that required resources are available. The concept card will provide the methods to use, how much time is allowed for each method, the type of media, instructor/student ratio, and other notes regarding the lesson. In addition to the concept card, the Learning Analysis Worksheet(s) (LAWs), Learning Objective Worksheet(s) (LOWs), and all applicable references are reviewed to provide the background and thought process from the Design phase. This information will assist the curriculum developer in ensuring that the written lesson meets the intended lesson goals.

LAW – Learning Analysis Worksheet

3402. WRITE A LESSON PLAN

The lesson plan is a comprehensive document that details the strategy to be used in teaching the learning objectives. Before learning the mechanics of writing a lesson plan, it is important to understand the function and components of the lesson plan.

The lesson plan is a comprehensive document that details the strategy to be used in teaching the learning objectives.

1. <u>Functions of a Lesson Plan</u> The lesson plan has three functions:

a. First, it provides the instructor, regardless of individual level of expertise, with a detailed script establishing all the information concerning preparation and delivery of the lesson content.

b. Second, it establishes continuity and standardization of instruction so that the same information is taught every time.

c. Third, it provides a historical document of what has been taught at the formal school/detachment.

2. Components of a Lesson Plan The title page, introduction, body, and summary are the primary components found in a lesson plan. Refer to Appendix B for a sample of the format to use when writing the lesson plan.

a. **Title Page** The title page is the cover sheet for the lesson plan.

b. **Introduction** The introduction is written to gain the attention of the student at the beginning of the lesson and provide an overview of what the student can expect in relation to the lesson. There are seven parts to an introduction. They are the gain attention, overview, learning objectives, method and media, evaluation, Safety/Cease Training brief (per the ORAW) and the transition into the body. These parts will be discussed in more detail later in this section.

Refer to Appendix B for a sample of the format to use when writing the lesson plan.

c. **Body** The body of a lesson plan is a detailed script of the content to be presented. It is written to cover all of the information necessary to master the learning objectives for the lesson. It includes the main ideas, lesson content, transitions, instructor notes, and cues for the instructor.

d. **Summary** The summary provides a review of the main ideas, reinforces the importance of the content, and includes administrative instructions for the students.

How to Write a Lesson Plan

Writing the lesson plan involves producing a detailed script that establishes what needs to be said and done during the lesson so that the students are able to meet the learning objectives. The lesson plan is written in the following sequence:

1. **Title Page.**
2. **Body.**
3. **Introduction.**
4. **Insert Transitions, Instructor Notes, and Cues.**
5. **Summary.**

The title page is produced first. Next, the body is outlined and written so that a conceptual framework is established. This conceptual framework establishes the main ideas and the sequence in which they will be introduced. Since the introduction provides an overview of the conceptual framework, it is written after the body is developed. Once the introduction is completed, transitions, instructor notes, and cues are inserted into the lesson. Last, the summary is written to bring closure to the lesson.

The following steps detail how to write each component:

1. Title Page The title page contains the school's name and address centered at the top. Centered in the middle of the page are the lesson title, lesson designator, course title, course identification number, and the date the lesson was developed or revised. At the bottom of the page is the signature block and date of approval. (See Appendix B for a sample lesson plan.)

2. Writing the Body When writing the body the curriculum developer establishes and sequences the main ideas, inserts content, provides examples, determines and inserts methods. This is done in a manner so that the material flows and aids the transfer of learning.

Steps in writing the body are as follows:

a. **Establish Main Ideas.**
b. **Sequence Main Ideas.**
c. **Insert Content.**
d. **Provide Examples.**
e. **Determine Placement of Methods.**
f. **Insert Methods.**

a. **Establish Main Ideas** Within the body, main ideas are numbered 1, 2, 3, and so on. As a general rule, the main ideas correspond with the learning objectives. However, there are times when an ELO is complex and must be broken into more than one main idea. The main ideas need to be bold, underlined, and uppercase so that they can be easily distinguished from the rest of the lesson content by the instructor. The grouped and sequenced knowledge and skills that were produced during the learning analysis can be used to break the main ideas into specific subheadings detailing the outline. Such knowledge and skills provide the curriculum developer with more comprehensive information to cover within the lesson.

The format for the body is as follows:

1. **MAIN IDEA #1.**

   a. **Paragraph Heading.**

      (1) Paragraph Heading.

         (a) Paragraph Heading.

            1 Paragraph Heading.

               a Paragraph Heading.

b. **Sequence Main Ideas** The main ideas are normally presented in the same order as the learning objectives. The initial sequence of the learning objectives was determined during the Design Phase. However, the curriculum developer may have to re-sequence the main ideas to ensure that the lesson plan flows logically, student retention is maximized, and logistical constraints are met.

c. **Insert Content** Content is now inserted to explain, in detail, the main ideas and subheadings. The information is compiled from the references noted on the concept card (e.g., technical manuals, Orders, and reference publications). It is the curriculum developer's responsibility to ensure that the information is explained in such a way that the instructor can easily understand the content.

d. **Provide Examples** In addition to the teaching points, real world examples and experiences are placed in the outline to aid the learning process and provide realism for students. The material must be structured to present a variety of examples to explain a topic. The use of multiple examples helps students with varying experience and comprehension levels better understand the material. Examples also emphasize how to do or how not to do something and why.

e. **Determine Placement of Methods** The methods that were determined during the Design Phase are listed on the concept card. However, the placement of the method in the lesson plan is determined at the time that the lesson plan is being developed. For performance-based learning, the placement of lecture, demonstration, and practical application methods in the lesson plan is important to the learning process and level of retention.

1) **Lecture (Formal/Informal)** Lecture is assumed as the method for presenting the content of the lesson unless another method is noted. All other methods will have an associated instructor note and specific directions for employing that method. Lecture is generally used to provide the foundational knowledge required for the development of skills or attitudes. For instance, lecture is generally used before demonstration and practical application so that the students are familiar with the process or procedures before seeing and performing them.

2) **Demonstration** Demonstrations usually take place during or following the lecture. When using demonstration, the instructor explains the process or procedure while performing it for students. Demonstrations can be placed anywhere in the lesson, but are normally placed immediately prior to the practical application.

3) **Practical Application** Whenever students are learning a new skill or acquiring knowledge, they should be given the opportunity to practice what was taught. The more practice students are given during instruction, the more likely students are to retain the information and apply it to the job. When a practical application is involved, decisions must be made on the placement and frequency of the practice session(s) (massed versus distributed). Additionally, it must be determined whether the task(s) need to be taught as a whole or broken into parts (whole versus part practice sessions). More detail on these type of practice sessions are discussed below along with a chart to aid in this decision making process.

❶	**Massed Versus Distributed Practice Sessions**
❶	**Whole Versus Part Practice Sessions**

- **Massed Versus Distributed Practice Sessions** In *massed* practice, the learner engages in one or a few intensive, extended periods of practice with little or no rest between. The alternate form of practice is called *distributed*, in which the learner participates in many relatively short practice sessions spaced over time.

  Based on the time constraints of the course, the curriculum developer must decide whether to divide practice periods into segments of **distributed practice** or plan one continuous session of massed practice. For instance, **distributed practice** interspersed with rest periods permits more efficient learning of psychomotor skills than does massed practice. The reason for this is that rest periods allow students to overcome the fatigue that builds up when performing the same procedures continuously. The greater the length or difficulty of the task, the more appropriate distributed practice is relative to massed practice.

	Shorter & More Frequent	**Longer and Less Frequent**
If the Task	Is simple, repetitive, or boring Demands intense concentration Is fatiguing Demands close attention to detail	Is complex Has many elements Requires warm-up Is a new one for the performer
If the Learner	Is young or immature (unable to sustain activity) Has short attention span Has poor concentration skills Fatigues easily	Is older or more mature Is able to concentrate for long periods of time Has good ability to focus attention Tires less easily

Smith and Ragan (1999), *Instructional Design,* 2nd Edition.

- **Whole Versus Part Practice Sessions** The curriculum developer must decide if it is more efficient to teach an entire task at each practice session (whole) or to teach individual subtasks initially (part) and begin combining them as the student masters each subtask. For tasks that have highly interrelated subtasks (e.g., preparation of an operations order), the whole method is more efficient than the part method. When tasks do not have highly interrelated subtasks (e.g., preventive maintenance of the M16A2 rifle), the part method is superior to the whole method.

	Emphasize Whole	**Emphasize Parts**
If the Task	Has highly dependent (integrated) parts Is simple Is not meaningful in parts Is made up of simultaneously performed parts	Has highly individual parts Is very complex Is made up of individual skills Requires limited work on parts or different segments
If the Learner	Is able to remember long sequences Has a long attention span Is highly skilled	Has a limited memory span Is not able to concentrate for a long period of time Is having difficulty with a particular part Cannot succeed with the whole method

Smith and Ragan (1999), *Instructional Design,* 2nd Edition.

f. **Other Methods** During the Design phase, the appropriate method(s) for each learning objective was determined and placed on the Learning Objective Worksheet (LOW). The placement of method(s) in the lesson plan is determined by where the content for each learning objective is being taught. However, there are methods that can cover multiple learning objectives (see Section 2207). One such method is the case study that is placed at the end of the lesson for reinforcement. Before making decisions concerning the placement of alternate methods, consider the following:

1) The amount of knowledge and/or skill that the student needs as prerequisite for the method to enhance the learning process.
2) The amount of knowledge and/or skill that the student brings into the lesson.

g. **Insert Methods** Whenever there is a method, other than lecture, inserted in a lesson plan, specific instructions must be provided to the instructor. This provides the instructor with the details so that he/she is able to implement instruction as intended. When practical-application is inserted into the outline, practice and provide help headings are indicated to offer detail to the instructor. All other methods will have student role and instructor role headings. These headings are described in detail below.

1) **Practical Application** There are three headings used when inserting practical application. An example of the format follows.

- Practical Application Heading This heading is uppercase, bold, and underlined. Beside practical application, general information is provided to include group size, if applicable, and setup (handouts, turn charts, actual items to distribute, etc.) for the practical application. The purpose of the practical application and the desired outcome should be explained.
- Practice Heading This heading is uppercase and bold. Beside practice, the curriculum developer describes in detail step-by-step instructions for what the student's role in the practical application will be.
- Provide-Help Heading This heading is also uppercase and bold. Underneath the provide help heading are three subheadings describing the instructor's role before, during, and after the practical application. The subheadings include the safety brief, supervision and guidance, and debrief.

Example of format for Practical Application

PRACTICAL APPLICATION. Provide general information to include group size, if applicable, and setup (handouts, turn charts, actual items to distribute, etc.). Provide the purpose of the practical application.

PRACTICE: Describe in detail step-by-step instructions for what the student's role in the practical application will be.

PROVIDE-HELP: Describe the Instructor's role.
1. Safety Brief: (per the ORAW) This is a brief to the students on safety precautions and what to do if there is a mishap.
2. Supervision and Guidance: Describe what the instructor is doing during the PA, i.e., moving about the room, assisting students, answering questions.
3. Debrief: (If applicable) Allow participants opportunity to comment on what they experienced and/or observed. Provide overall feedback, guidance on any misconceptions, and review the learning points of the practical application.

2) **Other Methods** There are also three headings used when inserting other methods. An example of the format is on the next page.

- Method Heading The method heading identifies the method being used. This heading is uppercase, bold, and underlined. Beside the method, general information is provided to include group size, if applicable, and setup (handouts, turn charts, actual items to distribute, etc.). The purpose and desired outcome should also be explained here.
- Student Role Heading This heading is uppercase and bold. Beside student role, the curriculum developer describes in detail step-by-step instructions for what the student's role is during the method.
- Instructor Role Heading This heading is also uppercase and bold. Beside instructor role are three subheadings describing the instructor's role before, during, and after method implementation. The subheadings include the safety brief, supervision and guidance, and debrief.

Example of format used for methods other than practical application.

DEMONSTRATION. Provide general information to include group size, if applicable, and setup (handouts, turn charts, actual items to distribute, etc.).

STUDENT ROLE: Describe in detail step-by-step instructions for what the student's role during the demonstration will be.

INSTRUCTOR ROLE: Describe Instructor's role.
1. Safety Brief: (per the ORAW) This is a brief to students on safety precautions and what to do if there is a mishap.
2. Supervision and Guidance: Describe a detailed script of exactly what the instructor is doing during the demonstration.
3. Debrief: (If applicable) Allow students the opportunity to comment on what they experienced and/or observed. Provide overall feedback, guidance on any misconceptions, and review the learning points of the demonstration.

3. Write the Introduction There are seven parts to an introduction. They are the gain attention, overview, learning objectives, method (and media), evaluation, Safety/Cease Training brief, and the transition into the body.

a. **Gain Attention** The gain attention is developed to capture the students' interest. It must relate to the lesson content and inform the students why the information is important. The gain attention needs to provide the student with why he/she needs to learn the information. This is often referred to as the WIIFM ("What's in it for me?"). According to adult learning principles, adults are motivated to learn to the extent that they perceive what they learn is applicable to what they do (Refer to Chapter 6 for more on adult learners). By providing the relevance and intent of the lesson, the attention of the students is gained. The curriculum developer needs to provide in the lesson plan a completed gain attention, along with a few other possible ideas. Extra lines are placed below the gain attention so that the instructor can personalize the completed gain attention or use one of his/her own ideas. Any changes within the lesson plan need to be approved by the appropriate personnel in accordance with the formal school/detachment's Standing Operating Procedures (SOP).

The following items can be used for gain attentions:

- ☑ **Film clip.**
- ☑ **Skit.**
- ☑ **Historical/actual event.**
- ☑ **Rhetorical question.**
- ☑ **Unexpected/surprising statement.**

Types of gain attentions that can be used.

Regardless of the type of gain attention used, its elapsed time should be in proportion to the overall length of the lesson. For example, a gain attention for a one-hour class should be no more than 3-5 minutes.

b. **Overview** In the overview, the instructors can first introduce themselves along with their qualifications or experience. The overview then describes the intended outcome of the instruction and the conceptual framework of the lesson. A conceptual framework informs students of the learning agenda for the lesson by stating the main ideas that will be covered to achieve the desired outcome. By providing the conceptual framework, student anxiety is decreased. Adult learners prefer to be oriented to what will be covered (Refer to Chapter 6 for more information on adult learners). The overview may also state the lesson's relationship to other lessons within the course, if applicable.

c. **Learning Objectives** Learning objectives are presented early in the lesson to inform students what knowledge or skill is required for successful completion. It is critical for students to understand at the outset of a lesson what is expected of them. A lesson presents at least one (or more) Terminal Learning Objective(s) (TLOs) and two or more Enabling Learning Objective(s) (ELOs). Even if an ELO within a lesson only partially supports a TLO, that TLO is listed. Listing the TLO(s) provides focus for both the student and instructor. The TLO(s) are the desired goal(s) within the lesson plan and the ELO(s) are the main ideas that support the TLO(s). The TLO(s) and ELO(s) are transferred to the lesson plan verbatim and in the same sequence as they appear on the concept card. For lesson purpose classes, a statement is placed in this section to state, “There are no formal learning objectives.”

d. **Method/Media** The method/media section describes the delivery system that was selected in the learning analysis. This information is found on both the concept card and Learning Objective Worksheet (LOW). In addition, the method/media section of the introduction is the natural area to place administrative instructions that affect the delivery of the lesson. An instructor note must be inserted immediately following this section to ensure these instructions are delivered to the students.

An example of the format for the note explaining Instructional Rating Forms (IRF) is below:

INSTRUCTOR NOTE
Explain Instructional Rating Forms.

Insert instructor note to explain IRFs between the Method/Media and the Evaluation portion of the Introduction.

e. **Evaluation** Most learners want to know how, when, and where they will be tested on a lesson's content. In order to reduce student anxiety, the evaluation section of the introduction describes the type of evaluation, time, and location (i.e., "in accordance with the training schedule") of where the students' knowledge or skills will be evaluated. This information can be obtained from the training schedule and the exam concept card. For lesson purpose classes, there are no formal evaluations.

f. **Safety/Cease Training (CT) Brief** Lessons that involve risk of injury, or damage to equipment must include a safety brief. Explaining to the students that hazards have been identified and controls implemented to minimize the risks will reduce anxiety about the training. Identified controls and hazards are provided from the ORAW completed on the lesson. This also serves to make the students safety conscious before the first main idea is introduced. Additionally, the CT will be briefed if all students are required to know and initiate a stoppage of training. Regardless of the student's role, the instructor is responsible for reviewing and executing the CT policy for the lesson spelled out on the Operational Risk Assessment Worksheet located in the Master Lesson File (MLF).

When developing the Safety/Cease Training brief, refer directly to the ORA worksheet.

g. **Transition** A transition is placed between the introduction and the first main idea. This transition is where the instructor ensures all students have an understanding of what is going to be taught, how it is going to be taught, how they will be evaluated, and Safety/Cease Training procedures. The transition then introduces the first main idea. The curriculum developer must provide the transition, along with blank lines, so that the instructor can personalize.

An example of a transition into the body of a lesson.

TRANSITION: Are there any questions about what we will be covered, how it will be covered, or how you will be evaluated? Do you have any questions about the safety or Cease Training procedures? Now let's talk about (first main idea).

_____
_____
_____

4. Insert Transitions, Instructor Notes, and Cues Now that the body is outlined and the introduction is developed, the next step is to insert transitions, instructor notes, and cues (time, media, and break) into the lesson.

a. **Types of Transitions to Insert** Transitions tie together the different components, methods, and main ideas within the lesson by smoothly summarizing one main idea and introducing the next idea. The transition should reinforce the conceptual framework, allowing the instructor to probe and gather feedback from the students.

1) **Transition** A transition is placed between the introduction and the first main idea, between each main idea in the lesson, and between the last main idea and the summary. A transition contains three elements: review, probe, and introduce.

- Review. The review is done by smoothly summarizing the main idea that was just taught. The students are then asked if they have any questions about the information covered so far.

- Probe. The probe allows the instructor to confirm student comprehension by asking questions and accepting feedback. At least one question should be asked during a transition that relates to the last main idea covered. The curriculum developer writes the question to be posed and its intended answer directly in the lesson plan. Questions need to be challenging and cover the critical point of the last main idea. Unless a direct question actually appears in the transition, inexperienced instructors may not ask a probing question. However, blank lines are left at the end of each transition so that the instructor has room to personalize each transition. If the instructor personalizes the transition, he/she must be sure to review, probe, and introduce the next main idea. The transition should not be the only place where questions are posed. (Refer to Section 4301 for more on questioning.)

A transition contains three elements: review, probe, and introduce.

- Introduce next main idea. The introduction of the next main idea takes the instructor smoothly into the content to be covered next.

To sum it up, after a review of the main idea, an overhead question appears to allow students an opportunity to ask any question on the material (i.e., "Are there any questions on ___?"). This is followed by at least one direct question that will be asked during the transition. It comes from the last main idea taught (i.e., Q: "What is the... A:"). Then the next main idea is introduced.

An example of a transition is in the shaded box below:

TRANSITION: Now that we've talked about why the SAT is important, are there any questions? QUESTION: Why does the Marine Corps use the Systems Approach to Training? ANSWER: The process reduces subjectivity in how formal school decisions are made regarding curriculum and instruction. Now, let's talk about how the SAT is used in the formal school/detachment environment.

_____

_____

2) **Interim Transitions** Interim transitions are used when a method (e.g., practical application, demonstration, etc.) or break is inserted within the main idea. These transitions are placed before the new method to provide the instructor with guidelines of how to transition from the lecture to the next method or break. Once the method or break is complete, another transition must be placed to close out the method and transition back to lecture. An interim transition is different from other transitions because it does not require a probing question. If a new main idea is to be introduced following the method or break, then a transition should be written to review, probe, and introduce the next main idea.

Interim Transitions contain Elements:

1. Review
2. Introduce method or next heading

An example of an interim transition is in the shaded box below:

INTERIM TRANSITION: Thus far, we have discussed the techniques used for effective questioning. Does anyone have any questions about questioning techniques? At this point, we're going to do a practical application where you will use the different questioning techniques.

_____

b. **Insert Instructor Notes** Instructor notes include information pertinent to the conduct of the lesson and can appear throughout the lesson. These notes are normally short and concise. Instructor notes are especially valuable to alternate instructors. As with cues, instructor notes should stand out from the normal text as illustrated below with a text box.

An example of the format for an instructor note is below:

INSTRUCTOR NOTE
Have the students refer to TM 9-2350-264-10-1 for preparing the driver's station on the M1A1 tank.

c. **Insert Cues** There are three types of cues contained in the lesson to assist the instructor with the presentation of the material. All cues must stand out from the regular text of the lesson. The three types of cues are:

3 Types of Cues

1. **Time Cues**
2. **Media Cues**
3. **Break Cues**

1) **Time Cues.** Time cues are approximations for the amount of time required by the instructor to present each lesson component.

- Main Headings. Time cues for main headings (Introduction, Body, and Summary) are placed right justified of the heading. The cue is bold, capitalized, and in parenthesis **(30 MIN)**. The main heading time cues (Introduction, Body, and Summary) add up to equal the total lesson time.

- Main Ideas. Time cues for the main ideas within the Body are placed two spaces after the main idea. The main idea cue is bold, natural-cased text, and in parenthesis **(30 min)**. All main idea time cues add up to the Body time cue. The sum of all the main heading time cues [and, at times, method time cues (see below)] in a lesson plan equals the total time for the lesson reflected on the concept card.

- Methods. The time allotted for a particular method (demonstration, practical application, case study, etc.) is explained within the method instructions, with the **exception** of one case. If a method is not within a main idea, then it has its own time cue. For example, if three main ideas are covered and a practical application is inserted at the end to practice material covered in all of the main ideas (mass practice), then that practical application is given its own time cue since the method is not associated with any **one** main idea.

One exception within time cues for methods

2) **Media Cues** Media cues are placed throughout the lesson to tell the instructor what media to use and when to present it during the lesson. An alpha/numeric designator is used to identify specific medium at a specific point in the lesson. For example, **(ON SLIDE #1)** indicates to the instructor to employ slide #1 of the presentation.

3) **Breaks Cues** Students are more likely to retain information if breaks are built into the course. It is generally recommended to allow a ten-minute break after every 50 minutes of instruction. Remember, it is important for the instructor to summarize information via a transition from day-to-day, lesson-to-lesson, and before and after breaks so the flow of instruction is not disrupted. A related activity can also be inserted to regain the students' attention to the subject material after the break.

NOTE: A break cue is not counted as a separate time cue when it is within a main idea. However, if the break cue falls between main ideas, then it becomes a time cue. In a case where a break cue becomes a time cue, the main idea time cues and the break cue are added together to equal the Body time cue.

An example of the format for a break cue is below:

(BREAK - 10 Min)

5. Review Lesson Plan and ORA Compare the lesson plan with the ORA worksheet to ensure that all hazards have been identified and that the controls have been integrated into the lesson plan.

6. Write the Summary The summary is a short paragraph which restates the main ideas (conceptual framework) discussed during the lesson. The summary is not used to re-teach material nor introduce new material; it is concise. No questions are asked or answered during the summary of a lesson. All questions should have been answered in the body and in the transitions. The summary needs to provide closure, a "mini-WIIFM," quote, or similar item, which will confirm why it is important for the student to remember what was taught. The final element of the summary given to the student is closing instructions, i.e. "Fill out IRFs and take a ten-minute break."

3403. STUDENT MATERIALS

Student materials serve as a guide to what is being presented in the course. These materials can provide class participants with additional facts and information. These materials also serve as a study guide that should be referred to during the course and/or as a job aid that students can take back to their unit following the completion of the course. When developing student materials, the appeal and ease of their use needs to be considered. These materials are supplied to aid the student in his/her learning. There are two types of student materials, student outlines, and supplemental student materials. Each is designed for a specific purpose that will aid the student during the course.

IRF – Instructional Rating Form.

When developing student materials, the appeal and ease of their use needs to be considered.

1. Student Outline The student outline provides the student with a general structure to follow during the class and a conceptual framework that highlights the main ideas of the class. It contains the learning objectives, lesson outline, and any references used to build the lesson. It also includes any additional notes or information, such as graphics (charts, graphs, clip art, photos, diagrams) deemed necessary. When developing the student outline, it does not have to be in Naval Format or in outline form. It should be developed in a way that the student is able to easily follow and use. Regardless of the format, all pertinent information from the lesson plan should be included, as described above. Appendix B provides examples of some different formats for student outlines. Student outlines can be written using one or a combination of the following styles:

a. **Completed** This style provides students with a "cut-and-paste" of the body from the instructor's lesson plan that excludes the administrative information, introduction, any cues, instructor notes, and/or the summary. This style is desirable when students are expected to read the entire outline during class, are unable to take notes or follow along during class, or when instruction takes place outdoors. It is very useful as a study guide or a job aid.

b. **Fill in the blank** This style uses an abridged form of the completed style with key terms or phrases omitted and replaced with blank lines. It is developed as a skeleton outline of the lesson plan. It is the student's responsibility to follow the lecture and fill in the missing information. When students complete the missing key terms or phrases, they are more likely to remember the material as they heard, saw, and wrote it. Presentation of the lesson must be structured to allow students time to fill in the blanks. This style of outline is not recommended for subjects of a technical nature.

c. **Bullet** This style incorporates short, informational statements presented in the same sequence as in the lesson plan. The student must take detailed notes to complete the information. Curriculum developers must take this into consideration and leave sufficient “empty space” for student’s notes in the outline. The bulleted style is not recommended for those students with little or no knowledge of the subject.

2. Supplemental Student Materials Supplemental student materials include handouts, other than the student outline, given to the class in support of the instruction. Supplemental student materials may include advance handouts to prepare the student for class. Additionally, supplemental student materials may include answer keys to quizzes, additional articles for reading, reference materials such as technical manuals, graphs, charts, formulas, figures, and maps. The use and number of supplemental student materials is optional and they can be presented in any format. The distinction needs to be made between supplemental student materials and classroom instructional aids. The distinction is made based on ownership. Supplemental student materials will be items that students are able to take with them following the class. Instructional aids belong to the instructor for use in the classroom. Although the students use them during the class, they do not retain them at the end of the lesson. All supplemental student materials should support the learning objectives being taught.

3404. DEVELOP MEDIA

Instructional media are developed to enhance verbal information and increase the student's ability to retain the information identified in the learning objectives by appealing to the different senses.

Several factors affect the development of instructional media and materials. The relative importance of each of these factors depends on the media that have been selected. These factors are personnel, time, funds, equipment, and facilities. The curriculum developer determines whether they will use the media and material in their current form, make modifications, or purchase/create anew. This decision is based upon the resources available to the formal school/detachment as identified on the concept card. Resources may be available through local commands and/or bases. For example, major Marine Corps installations have Combat Visual Information Centers (CVIC) and Combat Camera Reproduction Units with trained personnel to operate media production equipment and can produce various types of media. Curriculum developers and/or instructors can contact the center/unit and request the media type.

- **Using existing materials is cost and time effective. The impact on other classes must be considered.**
- **Modifications can be made easily to some but not all media types. Cost and time may impact.**
- **Purchasing new materials involves few personnel but generally entails a substantial acquisition cost.**
- **Creating new materials will involve all the resources of personnel, time, funds, equipment, and facilities.**

Copyright Some material used as media may be copyrighted. Permission to use copyrighted material can be requested from the owner/holder. If copyright permission has been given, then it should be referenced in the Master Lesson File (MLF) and the media. Permission can usually be obtained in a timely manner by faxing a letter to the copyright owner requesting permission and stating that **"the material will be used for government training/education."** In certain cases, copyrighted material can be used without having obtained permission from the owner/holder under the **"fair use"** doctrine. However, the appropriate legal authority should be addressed when using copyrighted materials under **"fair use."** Contact your command/base legal service office for further information on the "fair use" doctrine.

3405. MEDIA DEVELOPMENT CONSIDERATIONS

Storyboard – visual and verbal outline.

Using the lesson plan and visualizing different ways to present each point can generate new ideas for media. A storyboard is one way to plan the presentation. It can be used as a visual and verbal outline of the lesson. Not all curriculum developers will use a storyboard to write down/sketch ideas, but it is a tool that generally saves time. Regardless of how the ideas are brainstormed, there are a few general guidelines or considerations regarding alignment, fonts, lettering, graphic devices, and color that can enhance development. Use a consistent design (e.g., backgrounds, colors, and fonts, throughout a presentation).

1. Alignment Alignment sets a clear pattern to help the viewer find information in each frame and creates a sense of clarity within the presentation. The alignment scheme chosen for each presentation dictates how the elements will line up throughout the presentation.

Alignment Examples

Left Alignment

Centered Alignment

Right Alignment

Print media such as newspapers columns are usually justified text

a. **Flush Left Alignment** Natural and easy to follow, establishes a solid visual anchor, and is the preferred alignment for presentations.

b. **Centered Alignment** The most formal and conservative alignment formats are centered. Centered alignment is done to align information in the middle throughout the presentation without visual anchors. Center alignment is predominately for headings. This alignment is used primarily in print media and only sparingly in a presentation.

c. **Right Alignment** The opposite of flush left is flush right text. It is best to avoid flush right text. Align graphics flush right only if there is a strong left vertical image. Right alignment can be used to intentionally call attention to text. Numbers are always flush right.

d. **Justified Text** Justified text is flush on both the right and left sides. Print media such as newspapers columns are usually justified text.

2. Font Type In presentation design we normally use two types of fonts: serif and sans serif.

Serif Fonts

Times New Roman
Courier New
Rockwell

a. **Serif Fonts** Serif fonts have a small finishing stroke at the ends of the main character stem. Serif fonts are primarily used for print media, such as books, because they are easy to read in quantity. Examples: Times New Roman, Courier New and Rockwell.

Sans Serif Fonts

Arial
Tahoma

b. **Sans Serif Fonts** Sans serif fonts are letters without small finishing strokes. They are rarely used for books but are preferred for projected media. They project well and are more legible than serif fonts. Examples: Arial, Avant Garde and Tahoma.

3. Font Size Be sure to use a consistent type size throughout the media, whether it is print or projected media.

a. The recommended font size for projected media is 32-36 points.

b. Font size should be no smaller than 24 points if it is going to be projected.

c. The recommended font size for print media is 10-12 points.

d. The size of print to use for turn charts is dependent upon the room size and the number of students. Lettering on turn charts needs to be at least 1 inch.

4. Case When using words in any form of media, there are four different cases that can be used.

a. **Title Case** In this case, every word has the first letter capitalized, except articles (a, an, the). As the name implies, it is used for titles. Notice that the items on this page that are bold and underlined use Title Case.

b. **Sentence Case** This is normal capitalization where the first word of every sentence is capitalized. The sentences found on this page use sentence case.

c. **Lower Case** This case uses no capital letters at all.

d. **Upper Case** This case uses all capital letters. It is useful for highlighting important terms and should be used sparingly. It is not recommended to use UPPERCASE LETTERS ONLY. All uppercase letters generally reduce legibility and slow down reading. In projected media, upper case letters can be used for titles. However, sentence or bulleted text should not use all upper case.

5. Graphic Devices

a. **Lines** Lines can be used to add clarity to a layout, but use them sparingly. To emphasize a point, try changing the color or the weight (boldface) rather than underlining. Pay strict attention to the weight of the line and the color of the line.

b. **Borders** Presentation graphics rarely benefit from a border around the whole frame. Borders can convey the message that whatever is outside the border is not related to what's inside. However, borders can be used to frame a picture or a portion of text. Used this way, borders can enhance the visual appeal.

c. **Boxes** A solid color box set against the background offers a good alternative to a border. This can be a good way to call attention to content. Applying 3-D capability can show depth.

e. **Shadows** Shadowing is an extremely useful technique for generating dimension.

e. **Images** Most audiences sincerely appreciate image simplicity. Images may be pictures or clip art. Generally, using pictures that display real world meaning or tell a story can aid a student's ability to remember the teaching point. A picture can be worth a thousand words. When using images, it is important to ensure that the image is not skewed. Images can become skewed when their width or length is tampered. To ensure that you do not skew a picture, drag the corner of the picture so that the width and length increase by the same amount.

f. **Image Overload** Don't fall prey to image overload and frame clutter. Just because the capability is available to add unlimited typefaces, shadows, patterns, colors, and lines does not mean they will contribute to the presentation. Well-made images call attention to the content rather than themselves.

6. Why Use Color? Color is the best part of the presentation but also the hardest to handle. The reason to use color in a presentation is to show things the way they are seen...green grass; blue sky; orange sunset.

a. **Color Association** There can be benefits from color associations by developing signature color schemes in the presentation. For example, all money is green; all definitions are highlighted in blue. If using expected colors like blue denotes skies or red denotes stop, etc., the audience will associate certain colors with images or meanings.

b. **Color Differentiation** Colors can distinguish like and unlike elements. Similar bits of information can be subtly differentiated using light and dark tones of the same color. Consistent graphic elements should be linked from frame to frame with a consistent application of color. Providing a good contrast in colors not only enhances the ability to read and make a distinction between graphic devices, but it also takes into consideration those who may have less than normal color vision. The trick is to enhance difference in brightness and to avoid color combinations that do not contrast well.

c. **Color Emphasis** By assigning a particular element a color that is brighter or lighter than the rest, emphasis can be brought to the element.

Making a Color Palette

Select the background color first. Normally, the background in electronic presentations is dark. Dark backgrounds require light or white text. The bullet color should contrast with the background. Select colors that contrast with the background but do not overwhelm. Be consistent with your color throughout the presentation. If you can't read it, neither can your audience.

- Title each turn chart page or poster.
- Use more than one color, but not more than four. Reproductions of pictures or diagrams may already have more than four colors.
- If writing information on a turn chart for repeated use, then make sure to use broad-tip marking pens that provide contrast but will not bleed through to the next sheet. Watercolor brands will not bleed.
- Allow 3"-4" margins on both sides. When developing turn charts and posters, consider the size of the classroom that the visual will be used in, the seating arrangement, and the number of students. Keep a large margin at

the bottom so that images and information are not below the student's line of view.

- Print rather than use cursive writing.
- Ensure that images and writing is large enough to be legible to an intended group.
- Keep words short or use well-understood abbreviations.
- Include simple drawings, symbols, and charts if it helps the learning point.
- Laminate to protect for repeated use.
- Indexing tabs can be used to quickly reference a specific chart.

7. Projected Media Projected media includes transparencies, projection of actual object (opaque projector), computer aided graphics, and video.

a. **Transparencies**

- With transparencies more graphical elements than text need to be used. Viewers will stop reading text once they know what it says, but they will continue to look at illustrations. Use text for key ideas only.
- Use bullets with key words and phrases.
- Ensure that text will be large enough and clear enough for easy reading. Use plain typeface. If you can read the transparency can be read while it's on the floor, then the lettering is fine.
- Background. Blue transparencies provide a neutral background for black text and illustrations; yellow transparencies with black text are highly legible; clear transparencies are best if color is used in the content.
- Place frames on transparency. This will eliminate light leak when projecting them.
- Number the slides to correspond with the media cues in the lesson plan.

b. **Computer Aided Graphics (i.e., PowerPoint)**

- One idea, thought, or concept per screen.
- It is recommended that no more than two fonts be used in a visual.
- For projected media, adhere to the six by six rule: no more than six lines per visual; six words per line. Keep it short and simple (KISS).
- Provide generous use of empty space to increase ease of reading. Leave blank lines between paragraphs (print media) or bullets (projected media).
- Check for technical accuracy, completeness, programming errors, and blurred slides prior to publication or production to ensure quality. Spell-check the presentation.
- Projected media will look different on the screen than it does on the computer monitor. Different projection systems (LCD projectors, television and large monitors) will all display slightly different shades of colors. Colors need to have good contrast to project well.
- Be careful with animation and sound. Too much animation or sound can become distracting to the audience.
- It is critical to construct a layout structure that will work for your whole presentation. All frames should have the same basic structure, backgrounds, color palette, type style and size, heading placement, and alignment. Most computer graphic software titles allow a choice of templates that will give the presentation this unity.
- Ensure the presentation is properly paced, not too fast or too slow. Do not overload students with too much information or too many images at one time. For example, developing a slide show, it may be appropriate to animate one bullet at a time.

c. **Video** Videos can be produced in-house by curriculum developers or with the aid of a videographer [Combat Visual Information Centers (CVIC), Combat Camera Reproduction Units, etc.]. Video can be used stand alone or in conjunction with computer-aid graphics. Additionally, video clips can be found on the Internet or full-length tapes can be purchased. As with all media, ensure that appropriate measures are taken if material is copyrighted.

Some guidelines to consider when developing video or inserting video clips into other media are:

- Ensure that the computers that will be used for video/audio clips can support the presentation. Pictures, clip art and video can use a lot of memory.
- Ensure that images project well. Sometimes when video is enlarged to full screen, the quality is compromised. When a video is extended beyond its normal size, it can appear choppy and blurred.
- Material must focus on the objectives. Edit unrelated material. The video must communicate and reinforce major points. A video may be fun and interesting, but it needs to provide focus to class content.
- Show only relevant portion of video.
- Abstain from using offensive material (profanity, etc.) that can create barriers to learning. When using movies or video clips, consider all of the audience and ensure it maintains professionalism.
- Videos clips should be no more than 5-8 minutes in length as the viewer can easily lose focus of the intent of the clip and become engrossed in the video. Instructor notes need to detail how to introduce the video (what are the key elements the students need to watch for) and how to conduct discussion or questioning following the clip (tie what was observed into the lesson objective). As a general rule, full length videos of thirty minutes or more need to be stopped every 10-15 minutes for discussion or questions. This information needs to be stated in the instructor's notes.

3407. INSTRUCTOR PREPARATION GUIDE

The Instructor Preparation Guide is a required element of the Master Lesson File (MLF). This guide is created to provide the instructor with information that is critical to the preparation for implementing the lesson. Detailed information is given so that the instructor understands what resources are necessary for the lesson. Much of the information provided under administrative information is copied from the concept card. Though this guide is a MLF item, instructors can make a copy so that they can check off items when preparing for the lesson. An example of the Instructor Preparation Guide can be found in Appendix B. The minimum components for the Instructor Preparation Guide are listed below. This checklist can be added to as needed.

An example of the Instructor Preparation Guide can be found in Appendix B.

1. Lesson Title and Lesson Designator The lesson title and lesson designator are provided to identify the lesson. Both can be found on the concept card.

2. Total Lesson Time Refer to the concept card for the total lesson time. This provides the instructor with the amount of time that he/she has to teach the lesson.

3. References List all of the references from the concept card.

4. Location of Test The location of the test is provided so that the instructor will know where to go to gather the test materials.

5. Personnel Required List all personnel that will be required to implement the lesson (e.g., instructors, support personnel, Corpsman). Check the student to instructor ratio and notes on the concept card for this information.

6. Facilities The facilities required for the lesson need to be listed (e.g., classrooms, labs, ranges, etc.). Some facilities may require prior coordination to ensure availability.

The above components are listed as follows:

LESSON TITLE:	Assemble a Master Lesson File
LESSON DESIGNATOR:	CD0209
TOTAL LESSON TIME:	30 Minutes
REFERENCES:	MCO 1553.2, SAT Manual, MCAIMS User's Manual
LOCATION OF TEST:	See Course Chief
PERSONNEL REQUIRED:	1 Instructor
FACILITIES:	30 seat classroom

Top portion of the Instructor Preparation Guide.

7. Review Course Materials This checkbox is necessary so that the instructor will review the course materials to identify any potential problems prior to instruction.

REVIEW COURSE MATERIALS:
- Review the course/training schedule, administrative requirements, student background information, lesson plans, student materials, media, and evaluations (tests).

8. Personalization This checkbox is necessary so that the instructor adds personalization to the lesson plan.

PERSONALIZATION:
- Personalize the lesson plan by adding subject matter detail, relating personal experiences, providing examples, and/or interactive techniques.

9. Materials/Equipment All materials and equipment needed to conduct the lesson are listed here with check boxes so that the instructor can gather materials well in advance of the lesson. Materials may include models, mockups, audiovisual equipment, handouts, etc.

MATERIALS/EQUIPMENT:
- Video Cassette for Gain Attention
- VCR
- 30 Brown Binders for Master Lesson Files
- 30 Master Lesson File Checklists

10. Exercise Setup and Planning Each exercise (e.g., demonstration, practical application) is listed here. Underneath each, the setup and planning is described in sequence with check boxes to the side.

EXERCISE SETUP AND PLANNING:
Demonstration
- An MLF binder is ready to hand out to each student.
- The MLF checklists are ready to hand out to each student.
- Ensure that classroom is set up so that demonstration can be seen by all.

11. Safety The ORA worksheet is a required element of the MLF and must be reviewed by the instructor. This checklist also requires that the instructor reassess the environment for changes (e.g., weather or worn equipment) and report findings on the AIR.

SAFETY:
- Review ORA worksheet in Master Lesson File
- Reassess the environment for changes that affect the original ORA. Document any additional considerations/controls on the After Instruction Report (AIR) for future reference.

12. Other Possible Items Additional items can be added to the checklist if deemed necessary by the formal school/detachment.

13. Approving Signature and Date A space is provided for the designated approving authority's signature and date. The formal school's SOP will dictate who approves the Instructor Preparation Guide.

SECTION 5

3500. CONSTRUCT TESTS

Tests are designed to evaluate if the learner has the knowledge and skills required to master the objective or task. Back in the Design Phase, test items were developed for each learning objective. Now, based upon the course structure and when specific learning objectives are to be tested, the test is constructed. Before going into the steps for constructing a test, there must be an understanding of the methods of tests, categories of tests, and the types of tests.

3501. METHODS OF TESTS

1. Knowledge-Based Test As was discussed in Chapter 2, Section 2207 of the Design Phase, knowledge-based testing can be done through oral or written tests. This method of testing does not evaluate the student's ability to perform the required job skills; however, it does determine if the student knows how to perform the required job skills. Two advantages of this method are its high degree of objectivity in scoring (the capability of measuring a large numbers of facts, ideas, or principles in a relatively short time) and the convenience in the development of statistical analysis. There are a number of factors that force Formal Schools to administer knowledge tests: time, cost, safety, and resource constraints that do not always permit performance-based testing.

2. Performance-Based Test This evaluation deals with the assessment of technical skills, usually physical/motor skills. It usually deals with physical performance that follows a procedure or sequence of steps, which is called a process, or the end result, which is called a product. A test item that requires the student to replicate a task that is performed on the job is considered performance-based. A performance-based test will usually have a checklist that clearly defines the steps or procedures that must be completed to master the objective. In some circumstances, a written test can be considered a performance-based test if the student actually performs that item on the job. For example, filling out a DD Form 214 is a valid performance test for a student who actually fills those out on the job. A performance test duplicates the actual behavior by using the same equipment, resources, setting, or circumstances that the student will encounter on the job.

3502. CATEGORIES OF TESTS

There are different purposes for giving tests. Below are some categories of testing along with their purpose. Since criterion-referenced testing is the preferred method of evaluation for the Marine Corps, more focus has been given to it.

1. Criterion-Referenced Test These tests are used to evaluate the student's accomplishment of the criterion objective and to determine the effectiveness of the instructional system. Criterion-referenced tests are composed of items based on specific learning objectives. Each individual's ability to demonstrate mastery of the learning objectives is measured. The learner's achievement is measured against the predetermined criterion established in the learning objectives.

2. Diagnostic Test The purpose of diagnostic testing is to measure the achievement of the supporting skills and knowledge that contribute to the ability to perform the criterion objective.

3. Survey Test These tests are designed to determine what prospective students already know and can do before receiving instruction. The test is administered while the instructional system is being developed and provides important design data.

3503. TESTING INTERVALS

A student's knowledge and skill level can be tested at different intervals before, during, and after instruction. A pretest, progress test, and a posttest accomplish this.

Different test intervals.

Before
During
After

1. Pretest A pretest is designed to identify how much the student knows or is able to do prior to starting the course. This kind of testing is diagnostic in nature. It provides what level the student is at prior to the course.

2. Progress Test A progress test is administered throughout a course to evaluate student progress and to determine the degree to which students are accomplishing the learning objectives.

3. Post-test The purpose of a post-test is to identify/evaluate the effectiveness of instruction and how well the student learned. It is also a certification process. The student's ability to graduate from the course is generally based on post-test results. Therefore, **certification** that the student is able to go out in the real world and perform the job is provided through graduation.

3504. STEPS FOR CONSTRUCTING TESTS

The test items have already been written. Now the challenge is to properly assign and arrange test items, determine the grading criteria, develop scoring method, and develop the testing instructions.

1. Determining Mastery

Informal evaluation of learning objectives is accomplished through class work, homework, quizzes, and practical application.

a. **Mastery Learning** Criterion-referenced testing is the preferred method of testing for learning objectives taught in the formal school/training center. The criteria for test mastery are established by the learning objectives. The student, when completing a test, receives either a master (pass) or non-master (fail) for each learning objective. The student may be assigned an overall score, but it does not remove the responsibility of mastering each learning objective. Students that non-master a learning objective will receive remedial instruction and retesting until they reach the standard for mastery. The formal school will establish the remediation policy based on school resources (i.e., time, equipment utilization, availability of instructors). Students who do not master the learning objective during the established number of retests could be recycled through the program or dropped from the course.

b. **Determination of Course Mastery** The term "mastery" can be misleading – mastery does not mean or require that students pass with 100%. Students graduating from a course must, however, master 100% of the learning objectives.

c. **Determination of Learning Objective Mastery** A determination is made by the formal school/detachment as to what is the acceptable level of performance for mastery of each learning objective. It may easily be that, for some objectives, a score of 60% is indicative of mastery, while for others a score of 90% or higher would be required. The determination is based upon the criticality of the objective. Mastery of all ELOs does not necessarily result in the mastery of the TLO, just as receiving a minimum score on each individual event of the PFT does not necessarily mean that you receive an overall passing score on the PFT.

2. Assigning Test Items When determining what test items to use, the idea is to measure **all** learning objectives. Formal evaluation of learning objectives is accomplished by testing **each** learning objective.

Informal evaluation of learning objectives is accomplished through class work, homework, quizzes, and practical application. This does not meet the requirement to test learning objectives in the formal school/detachment. There is no established formula for determining the most appropriate number of test items required for testing any given learning objective. However, the guidelines listed below are factors to consider:

a. **Criticality of skill** This refers to how important the skill is in relation to its application to actual job performance.

- **High**: Skill is used during job performance.
- **Moderate**: Skill influences job performance.
- **Low**: Skill has little influence on job performance.

b. **Other Criticality Factors** Refers to a learning objective's importance as related to the performance of a job task.

- **Safety to personnel/equipment: Critical tasks are those which are considered high risk or dangerous.**
- **Frequency of performance: The more often a task is performed, the more critical it becomes.**
- **Learning objective's importance to on-the-job performance.**
- **Learning objective's importance to the overall course mission.**

c. **Criticality of the objective** When both most critical and least critical objectives are measured on the same test, the critical objective should have more items to ensure that the test reflects the critical aspects of the course.

d. **Instructional time allotted to present the material** For example, if the majority of the material covers one objective, then the majority of the test items should cover that objective. This ensures the emphasis in the classroom.

e. **Complexity of the material** The more complex the material is, then the more test items are required to ensure understanding.

f. **Table of Specification** Another method to determine what test items need to be used is to use a Table of Specification such as the one below. This Table of Specification looks at the learning objectives and assists the test designer in determining the number of test items to include on a specific objective. This particular table relates to the cognitive domain. For more information on the cognitive domain, refer to Chapter 6, Adult Learning.

1) Write in the lesson name.
2) Under "Major Subjects/Topics," list the main subject/tasks for the lesson(s).
3) Identify whether the learning objective requires knowledge, comprehension or application.
4) Identify the learning objective(s) associated with the main subjects/task. Under (1), write the number of learning objectives covered in the main heading.
5) Identify the critical KSAs required to achieve the learning objective. Determine how many test items it will take to determine mastery of the learning objective. Since all learning objectives must be tested, the number under (2) cannot be less than then number under (1).
6) Under (3), write in actual number of test items.
7) List totals of rows under "Totals By Subject/Topic" columns.
8) List totals of columns on the bottom row beside "Totals By LO Level."

Figure 3-10. Table of Specification

1. WORKSHEET TABLE OF TEST SPECIFICATIONS FOR _____*Select Delivery System*_____
LESSON NAME

2. MAJOR SUBJECTS/TOPICS (Learning Objective Designator)	**3. LEVEL OF LEARNING OBJECTIVES**									**4. TOTALS BY SUBJECT/TOPIC**		
	A. Knowledge Facts, Terms, Symbols			B. Comprehension of Concepts, Principles			C. Application Information, Concepts, Principles					
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1. Adult Learning (9806.01.04c, 9806.01.05c)							**2**	**5**	**5**	**2**	**5**	**5**
2. Learning Domains (9806.01.04b, 9806.01.05b)							**2**	**6**	**6**	**2**	**6**	**6**
3. Learning Styles (9806.01.04c, 9806.01.05c)							**2**	**6**	**6**	**2**	**6**	**6**
4. Method Selection (9806.01.04, 9806.01.04a, 9806.01.04d)							**3**	**3**	**4**	**3**	**3**	**4**
5. Media Selection (9806.01.5, 9806.01.5a, 9806.01.5d)							**3**	**3**	**4**	**3**	**3**	**4**
5. TOTALS BY LO LEVEL							**12**	**23**	**25**	**12**	**23**	**25**

(1) = Number of Objectives; (2) = Minimum Number of Test Items, (3) = Actual Number of Test Items

3. Arranging Test Items When making decisions on how to arrange test items, consider the following:

a. **Test item placement** Test items should be placed on the page so each item stands out clearly from the others. For example, a true or false item that is two lines long would have single spacing with double-spacing between items. A space should separate the stem of multiple-choice items and the list of answers. The answers should be in a single column beneath the stem and should be indented beyond the paragraph margin.

Example of Multiple Choice Item:

1. What are the three Domains of Learning?

   a. Auditory, Visual, Kinesthetic
   b. Intellect, Value, Tactile
   c. Knowledge, Skill, Attitude
   d. Cognitive, Affective, Psychomotor

---

b. **Arrangement of test items** Items of the same type (e.g., multiple choice, short answer, essay) are grouped together in a test. Individual test items should also be arranged in approximate order of difficulty, which allows the students to progress as far as they can without spending excessive time on difficult items at the first part of the test.

c. **Design** A test is designed so that the majority of the students can complete it. When many students cannot complete a test, efficiency is lost and student morale suffers.

d. **Layout/Format** Below are some guidelines to consider when formatting the test:

1) Space items for easy reading and responding.
2) Provide generous borders.
3) List alternative responses vertically beneath the stem (multiple choice).
4) Do not split an item onto two separate pages.
5) If an answer sheet is not being provided, allow space for student answers.
6) Number items consecutively throughout the text.
7) If separate answers are used, number them so a check can be made for complete sets of materials before and after test administration.
8) Select an arrangement of items that serve the purposes of the test.

EVALUATING THE ASSEMBLED TEST	
1. Relevance	Do the test items present relevant tasks?
2. Conciseness	Are the test tasks stated in simple, clear language?
3. Soundness	Are the items of proper difficulty, free of defects, and do they have answers that are defensible?
4. Independence	Are the items free from overlapping, so that one item does not aid in answering another?
5. Arrangement	▪ Are items measuring the same outcome grouped together? ▪ Are items of the same type grouped together? ▪ Are items in order of increasing difficulty?
6. Numbering	Are the items numbered in order throughout the test?
7. Directions	▪ Are there directions for the whole test and each part? ▪ Are the directions concise and at the proper reading level? ▪ Do the directions include time limits and how to record answers?
8. Spacing	Does the spacing on the page contribute to ease of reading and responding?
9. Typing	Is the final copy free of typographical errors?

Assessment of Student Achievement. By Norman E. Gronlund. p. 122.

STEP 4

4. Developing Grading Criteria Grading criteria describe the standards by which the student will be measured and factors that will be considered in determining the student's grade on an individual performance or knowledge test/test items.

a. **Uses of criteria** Grading criteria enable the instructor to determine whether or not the student/group have met the objective. Additionally, it provides an unbiased and non-subjective evaluation of the student's ability with respect to a particular area of performance or knowledge. The primary concern of grading criteria should be that it describes what the student is expected to do and what happens if the requirements are not met.

b. **Grading Criteria for Performance Evaluations** The creation of grading criteria may be the most critical step in performance evaluation test development because it ensures standardized grading. The scoring guide contains a description of each step or group of steps to be graded. A pass/fail checklist describes in detail what constitutes satisfactory and unsatisfactory performance. Grading criteria for the course is a factor if the course is graded Mastery or Non-mastery; a checklist may be the most appropriate to use. If the course is graded with a numerical grade, a rating scale may be the most appropriate to use. When defining the checklist steps and rating scale decisions, all behaviors have to be written in sufficient detail so that all tasks are as precise as possible. The more completely the behaviors are described, the more effective the Job Sheet Checklist/Rating Scale will be. This helps remove instructor subjectivity from the grading process. Performance- and knowledge-based testing should not be combined. Multi-part tests can be constructed in MCAIMS to support situations where both forms of testing are needed.

c. **Other important grading criteria factors should include:**

1) Compliance with required safety precautions.
2) Correct operation of equipment after completed assembly.
3) Physical testing if the job is finished.
4) Time required completing the job.
5) Skill in using tools.
6) Care and use of the equipment.

5. Develop a Scoring Method

a. **Manually graded** A key or template needs to be developed to eliminate any subjectivity in the scoring process. Ensure this item is safeguarded against compromise. The essay test requires different scoring criteria. A model answer is required that lists all essential data a knowledgeable student can be expected to provide. This model is used as the standard answer by which all other answers are scored and the worth of each item or part of an item is set.

b. **Automated grading system** If tests are to be machine scored, precautions must be taken to see that the items can be used with machine-scored answer sheets. The MCAIMS Users Manual lists the only stock answer sheet to be used with schools' NCS Optical Mark Reader scanners.

Note: If test items have been recorded into MCAIMS and assigned to test, a computer equipped with an optical character reader scanner has the capability to score tests. This process is explained further in the MCAIMS User's Manual. Assessment of Student Achievement. 6th Ed. By Norman E. Gronlund. p.48

RULES FOR SCORING ESSAY ANSWERS
1. Evaluate answers to essay questions in terms of the learning outcomes being measured.
2. Score restricted-response answers by the point method, using a model answer as a guide.
3. Grade extended-response answers by the rating method, using defined criteria as a guide.
4. Evaluate all the students' answers to one question before proceeding to the next question.
5. Evaluate answers to essay questions without knowing the identity of the writer.
6. Whenever possible, have two or more persons grade each answer.

STEP 6

6. Test Instructions for the Student Once the desired test items are prepared, focus on the required information identifying the test. A complete set of instructions, either written, oral and/or by visual aid, must be given to the student. For written tests, a sample test item is given so that students understand how they should answer the question (i.e., circle, write out, "X"). The student instructions should specify the following:

a. References and materials are to be utilized during the test (if any).
b. Any rules for the test (e.g., "No talking.")
c. Time allowed for each section or for the whole test.
d. How to proceed with the test (i.e., individually, from part to part, from page to page or whether to wait for a signal.)
e. Procedures to follow after completing the test.
f. School's policy on cheating.

Student evaluation instructions are covered in Chapter 4, Section 4400.

STEP 7

7. Test Instructions for the Test Administrator/Proctor Specific instructions need to be written out to the test administrator/proctor so that there is uniformity in how the test is to be administered. The instructions should tell what is required for preparation in giving the test, how the test is to be administered, and how remediation is handled.

a. **Instructions for Preparing to Give Test should specify:**
1) What the testing materials are.
2) Where to gather the testing materials.
3) How many can be tested at a time if there's a limit.
4) Required testing environment (e.g. computer classroom, motor pool).
5) Seating arrangements (if applicable).
6) Prepare a "Testing" placard to be displayed outside the testing environment.

b. **Instructions for Administering the Test should specify:**
1) Whether the students can use references or other materials during the test.
2) Inform students of the cheating policy for the school.
3) Amount of time the students are given to complete the test.
4) Whether the test administrator/proctor is to answer questions during the test.

c. **Remediation Instructions should specify:**
1) Type of remediation that will be conducted.
2) Where the retest will be located.
3) Procedures for giving retest.

By preparing detailed instructions, the administration of the test is more likely to be standardized. The overall effect of the standardization is more reliable test results on student progress and level of mastery.

SECTION 6

3600. CONDUCT VALIDATION

Validation is a process of trying out instructional materials and course materials prior to implementation to ensure that mastery of the learning objectives is possible and reasonable. Validation involves examining the effectiveness of instructional materials by identifying strengths and weaknesses. The instructional material should be presented to members of the target population to determine its effectiveness. If the instruction does not enable students to reasonably achieve mastery, it is revised until it does.

3601. METHODS OF VALIDATION

1. Curriculum Validators There are a variety of methods for validating instruction. Validation of instructional materials should involve as many methods as possible. If all methods are to be used, they should be conducted in the order in which they are presented below. Personnel other than the curriculum developer(s) should conduct the validation to enhance objectivity. The personnel conducting the validation are referred to as **curriculum validators**.

2. Subject Matter Expert (SME) Technical Data Review SME technical data review involves reviewing course materials to ensure the technical accuracy of instructional material content. Although the instructional materials are not in final form at this stage, the content should still support the information provided in technical manuals and orders, job guides, and checklists. SME participation will help identify specific problem areas and provide additional technical data.

3. Curriculum Validation Teams (CVT) The CVT is a method of validation in which a team comprised of an experienced jobholder, a novice, a supervisor, an instructor, and a curriculum developer meet to review the instructional materials. The curriculum validator will coordinate the meeting as a facilitator only. As with the SME technical data review, the instructional materials are not in final form yet. Each of the participants of the CVT will examine the material from their different perspectives ensuring that materials are technically accurate, instructionally sound, and the learning level is appropriate to the target audience. For instance, a novice can point out gaps in the content that may be unnoticeable to SMEs, or vice versa. If there are disagreements among participants, a technical data review concerning all participants may be assembled to resolve the issue.

4. Pilot Course In this validation method, instructional materials in final form are presented to a target population group. This validation method is important because it takes into account individual student learning differences. Student samples should represent the entire range of the skill and knowledge level of the target population. Instructional materials should be presented under normal environmental conditions. For example, if the materials are intended for classroom use or field use that is the environment in which the trials should be conducted. The decision to use a pilot course as a validation method is based on the availability of the necessary members of the target population and time.

a. **Small Group** In a small group validation, the curriculum validator presents instructional materials to a small group (2-4 individuals) of the target population to determine if mastery can be attained.

b. **Large Group** During large group validation, the lesson plan is presented to a group of 5 or more people for validation. Presenting the lesson to a large group allows many people from different learning perspectives to receive the instruction. If time is a constraint, large group validation can be conducted concurrently with implementation.

5. Validation at First Implementation This type of validation involves presenting instructional materials, in their final form, to members of the target population at first implementation. In this case, validation and implementation are conducted concurrently for one presentation of a scheduled class. This is NOT the preferred method of validation, and is done only when there is not enough time to conduct validation of materials prior to implementation. Validation at first implementation should only be done as a last resort.

This is NOT the preferred method of validation

3602. TYPES OF DATA

The following are types of data gathered during validations. Depending upon the type of validation, data may vary in quantity.

1. Data Collected from Students Student data are collected to determine the attitude of students when they are presented with instruction, particularly anything that kept them from attaining mastery of the learning objectives. Additional student background information including age, time in service, past experience, past academic experience, current job assignment, etc., should also be collected. In the collection of data from students, students should provide their comments on the following:

a.	**Length of instruction.**
b.	**Comprehension of instruction.**
c.	**Student interest/motivation level.**
d.	**Realism to the job.**

2. Instructional Material Data Information on the effectiveness of the instructional material should be gathered from instructors, SMEs, students, and curriculum developers. These data can include effectiveness of:

a.	**Lesson plan.**
b.	**Student outline.**
c.	**Supplemental student materials.**
d.	**Media.**
e.	**Tests (see Chapter 5, section 5300, for procedures for analyzing test items).**
f.	**Practical applications.**

3. Instructional Procedures Data Data on the effectiveness of the delivery system (instructional methods and media) should be gathered from instructors, SMEs, students, and curriculum developers. These data may include effectiveness of:

a. **Method of instruction.**
b. **Order of instruction (training schedule).**
c. **Instructor presentation.**
d. **Number of instructors.**
e. **Instructional setting.**

4. Test Item Data During validation, test items should be analyzed to determine if they measure the knowledge or, skills required of the learning objectives. Test items should also be analyzed for reliability to determine if they produce consistent results. This is done through a process called test item analysis. Test item analysis is a set of procedures for evaluating the effectiveness of test items. Item analysis will identify which test items need to be revised or rejected. It is critical to conduct item analysis during validation prior to course implementation to ensure that the test items are valid. Chapter 5, Section 5300 presents detailed procedures for conducting test item analysis.

3603. STEPS FOR VALIDATING INSTRUCTION

1. Review Formal School/Detachment (SOP) Standing Operating Procedures The information needed to plan validation may be contained in the school validation plan located in the school's Academic SOP. This document may provide additional guidance on types of validation trials, data collection methods, and appropriate authority for approval.

2. Plan and Schedule Validation Plan and schedule validation to allow enough time to incorporate any improvements into the lessons prior to the start of the course. This is a critical step that must be well thought out. Validation is planned so that all trials can be conducted, data analyzed, and revisions made prior to implementation of the course. During this step, the type of data to be gathered (see Section 3602) and the type of validation methods (see Section 3601) are determined.

3. Determine Data Collection Procedures Once the validation method is selected, determine the system for collecting data. These data may be collected using surveys, questionnaires, interviews, group discussions, observations or other methods (see Chapter 5, Section 5603). Curriculum validators should ask open-ended questions so that participants can genuinely express their feelings, opinions, and perceptions of the effectiveness of the instruction. Curriculum validators must keep in mind that the purpose of validation is to obtain information that will improve instruction.

4. Implement Validation Plan Using the validation methods planned in Step 2 and the data collection procedures identified in Step 3, conduct the validation.

a. **SME Technical Data Review** Provide SMEs with instructional materials or instructional material content. Directions should be provided as well as the objectives of the validation.

b. **CVT** The curriculum validator gathers members for the CVT and serves as the facilitator of the meeting. The curriculum validator should ensure the following:

1) All participants contribute to the meeting.

2) Recommendations for revisions are understood by all participants and are recorded.

3) Any other feedback concerning the effectiveness of instruction is collected and recorded.

c. **Pilot Course Trial** A pilot trial is the most comprehensive and time-consuming validation to conduct. It involves conducting an actual class with a group of students within or similar to the target population group. To conduct a pilot trial, the curriculum validator will:

1) Gather students from the target population to receive the instruction.

2) Arrange the instructional setting as it will be arranged for the actual implementation of the class.

3) Identify and brief instructors who will participate in the field trial.

4) Develop questionnaires to collect data from students and instructors concerning their attitudes toward the effectiveness of instruction.

5) Ensure the instruction is conducted as it will be implemented.

STEP 5

5. Interpret and Record Validation Results Interpret and record data from the validation. Since there is no specific format for doing this, curriculum validators should record the results in a manner that meets their validation objectives. For example, data can be summarized in a brief paragraph annotating how many comments were made and the trends found detailing instructional strengths and deficiencies. If the data were collected using a scaled rating system, the answers should be averaged and presented as an average response for each question. This summation should also include recommendations for solutions to correct for instructional deficiencies. See Chapter 5, Section 5300 for detailed procedures concerning the analysis and interpretation of data.

STEP 6

6. Report Validation Results Once validation data are collected and the results are summarized, make recommendations for correcting problems. The summarized results will indicate what materials, methods, or media need revision report the validation results to the validation authority for approval.

3604. VALIDATION AUTHORITY

The responsibility for validation of instruction ultimately rests with the formal school/detachment commander. The method of validation is based on resources available. The commander provides guidance on conducting validations through a validation plan, usually found in the Standing Operation Procedures (SOP). The plan will identify who has validation authority. Decisions about how to validate are based on resources, as outlined in the table below.

For example, the following decisions concerning validation must be made by the formal school/detachment:

- **What personnel are available to conduct the validation (SMEs, instructors, curriculum developers, etc)?**
- **How many methods of validation (see Section 3402) will be used in validating course material? What specific revisions to instructional materials can be undertaken and still meet the planned course schedule?**
- **How do we obtain members of the target population for validation? If actual members of the target population are not available, then the school director should select individuals with backgrounds as similar as possible to those of the desired target population.**
- **How much time is available? If your time to design and develop a course is limited, you will have to choose a validation method that fits within the time constraints.**

SECTION 7

3700. DEVELOP A COURSE DESCRIPTIVE DATA (CDD) & PROGRAM OF INSTRUCTION (POI)

Every Marine Corps formal school/detachment must have an approved Program of Instruction (POI). A POI documents a formal school's plan for instructing Individual Training Standards (ITS). Specifically, a POI describes a course in terms of structure, delivery methods and media, length, intended learning objectives, and evaluation procedures. It also serves as a historical record that reflects the continual evolution of the course. An important element of the POI is the approved Course Descriptive Data (CDD) document. The CDD provides a summary of the course including instructional resources, class length, and curriculum breakdown. The CDD provides the justification and documentation for development or refinement of POIs taught at Marine Corps formal schools and training detachments.

3701. COURSE DESCRIPTIVE DATA (CDD)

1. Description An approved CDD authorizes the school/detachment to develop a new course or it authorizes a change to an existing course. The CDD does the following:

- Indicates the school's concept of how the course will meet the training needs as established in the ITS order or T&R manual.
- Identifies resource requirements needed to conduct the course from which decisions can be made.
- When approved, it authorizes further course development or refinement and commits TECOM resources for implementation.

An approved CDD authorizes the school/detachment to develop a new course, or it authorizes a change to an existing course. A school/detachment may submit a CDD and POI as a proposal to change a course for a number of reasons, to include departure from requirements published in an ITS order or T&R manual, new equipment; and revised tactics, techniques, and procedures. Full justification for any changes must accompany the revised CDD. Normally, the justification for change is contained in the Record of Proceedings (ROP) written after a CCRB.

a. **Formal School/Detachment Responsibilities** Formal schools or detachments should submit a MCAIMS generated CDD to CG, TECOM (GTB/ATB) to justify resource requirements for a new or revised course of instruction. If no significant changes are made, then a revised CDD/POI capturing all minor changes must be submitted every three years. A formal school cannot implement a course without a TECOM approved CDD. All formal schools and detachments will review active CDDs annually in connection with TECOM Financial Management Branch's annual budget data call.

b. **Submission and Approval of CDD** The CDD is one of the documents that TECOM uses to manage formal school instructional requirements.

1) A CDD is submitted to TECOM for review, staffing and approval. TECOM (GTB/ATB) has staff cognizance for CDD review, coordination and approval.

2) **New Course of Instruction** A formal school/Detachment will submit a CDD and a cover letter requesting approval to add a new course. The cover letter should address why the course is required, what deficiencies it will correct, and why it should be conducted in a formal school setting. MCO 1553.2_ describes the requirements for CDDs for new courses.

TECOM- Training & Education Command

3) TECOM (FSTB) records the information contained in the CDD along with data collected from the Occupational Field (OccFld) sponsor at Manpower and Reserve Affairs into the Training Resource Requirement Management System (TRRMS) database. TRRMS processes this information and produces a Training Input Plan (TIP) reflecting the annual instructional requirements and a four-year instructional plan for each formal school.

4) The CDD is also a source document for assignment of students to formal courses of instruction. For each course listed on the TIP, TRRMS generates a Training Quota Memorandum (TQM), which is loaded to the BY NAME ASSIGNMENT (BNA) system, an automated information system that enables order-writing commands to assign specific Marines to available course seats. These memoranda translate the annual TIP requirement into actual class seat quotas and form the basis for order writing.

c. **Elements of a CDD** (see APPENDIX B for a sample CDD). Each element of a CDD, in order of presentation (appearing as items #1 through #24 in a CDD), is addressed below:

1) **Course Title** The course title must appear as it is listed in MCO P1080.20_ (JUMPS/MMS Codes Manual) unless a change is required or the CDD is for a new course.

2) **Location** Record the complete address for each location the course is taught.

3) **Marine Corps Service School Code (SSC)** The SSC must correspond to the SSC listed in MCO P1080.20_ (JUMPSIMMS Codes Manual). If the course is new, record ‘"To be determined.’’

4) **Other Service Course Number** Use other pertinent service course numbers as provided by other branches of the military. If other service course numbers are not applicable, record “NA.”

5) **Military Assistance Program Articles and Service List Number** The military assistance program articles and service list number is a seven digit alphanumeric code used to identify a course intended for foreign military instruction. If this type of instruction is not applicable, record "NA.”

6) **Purpose** Include a concise statement about the goals of the instructional program.

7) **Scope** Provide a list of the main subjects covered in the course. The list should be comprehensive to include all topic areas.

8) **Length (Peacetime)** Record the total number of instructional days required for the course. The peacetime instructional week includes an average of 40 hours (8-hour day x 5 work days). Do not include holidays or weekends where instruction does not occur. TECOM's Financial Management Branch, will reconcile any exceptions, such as holidays, by comparing the number of instructional days to the TIP.

9) **Curriculum Breakdown (Peacetime)** Provide a breakdown of the curriculum in academic and administrative hours (see Section 3101). The Peacetime instructional week includes an average of 40 hours (8-hour day x 5 work days), 35 of which will be academic time (Administrative time exceeding five hours per week must be conducted after hours or justified in a waiver request). For detailed organizational and tracking purposes of instructional hours, academic hours should be further broken down into methods (e.g., , practical application, lecture, demonstration, performance evaluation, written evaluation). Administrative hours should also be broken down into appropriate methods . See the MCAIMS Users Manual for details.

10) **Length (Mobilization)** Record the total number of instructional days required for the course during wartime mobilization. During mobilization, the instructional week averages 60 hours (10-hour day x 6 days). For courses on three shifts with equipment or facility constraints, the mobilization instructional week averages 48 hours (8-hour day x 6 days). This time includes both academic and administrative hours. If the course will discontinue upon mobilization, enter "NA." If the course length is the same during mobilization as in peacetime, click "Same as peacetime."

11) **Curriculum Breakdown (Mobilization)** Provide a breakdown of the curriculum in academic and administrative hours for mobilization. During mobilization, it is likely that academic hours will increase and administrative hours will decrease. If the course will discontinue upon mobilization, enter "NA." If the curriculum breakdown is the same during mobilization as in peacetime, click "Same as peacetime."

12) **Maximum Class Capacity** Record the maximum number of students who can receive instruction using available resources. Resources include classrooms, messing, billeting, equipment, budget, and personnel available.

13) **Optimum Class Capacity** Record the number of students per class that can take maximum advantage of all the resources (e.g., facilities, equipment, instructional capabilities) available to the school.

14) **Minimum Class Capacity** Record the minimum number of students per class that will make the course cost effective.

15) **Class Frequency** Record the number of classes required to support the TIP for the current year.

16) **Student Prerequisites** List the prerequisites that personnel must meet to attend the course. This information can be found in

the Target Population Description (TPD) developed in the Analysis Phase and filed at the school.

17) **MOS Received** Record the Military Occupational Specialty (MOS) assigned to the student upon successful completion of the course. If the course does not result in an MOS assignment, record "None."

18) **Quota Control** Record the name of the agency managing course quotas. The OccFld sponsor can provide this information.

19) **Funding** Record the name of the agency that funds temporary additional duty incidental for students attending the course. In those instances where the using agency must also bear cost, an explanatory statement must be contained in this section. Courses are funded from a variety of sources, depending upon a number of factors such as student type, length of course, and career track. Basic guidelines for schools to determine the funding source are:

- Courses over 139 days or 20 weeks at one location are PCS and funded by MMOA/MMEA.
- Courses less than 139 days or 20 weeks may be unit-funded or TECOM-funded.
- Entry-level pipeline students – normally funded by MMOA or MMEA.
- Lateral Move students – may be unit-funded or TECOM-funded.
  Reserve students – normally funded by MARFORRES.

20) **Reporting Instructions** Designate to whom the student will report when arriving for a course of instruction, to include information on transportation and directions (both during and after working hours). Contact phone numbers, fax numbers, organizational e-mail, and website addresses are elements that are to be included. Also include a statement indicating the availability of government billeting and messing. Provide telephone number and office contact information to obtain billeting reservations or confirm that government quarters are not available. If there is more than one school location, include a separate set of instructions for each location.

21) **Instructor Staffing Requirements** Instructor staffing requirements are based on the academic course hours and computed in accordance with ITRO agreements, and are automatically computed by MCAIMS in the Instructor Computation Worksheet of the POI. Although instructor-staffing increases may be validated based on an approved CDD, the CDD itself will not generate a table of organization (T/O) change. After approval, separate correspondence must be submitted to CG, TECOM G-1 requesting a T/O change.

This section of the CDD lists the school's T/O number and its date, and the instructor and instructor supervisor billets by line number, grade, billet name, MOS requirements, and number, indicating those line numbers not currently filled. The Instructor Computation Worksheet (ICW) used to compute requirements should be included as an appendix to the CDD with the POI. Additional comments as to whether the billet is filled or not are required.

For formal school/training detachments located at another service's location, refer to MCO 1580.7_ and compute instructor-staffing requirements using the Inter-service Training Review Organization (ITRO) manpower computation formula. The ITRO Manpower Analysis Subcommittee Procedures Manual detailing this formula may be obtained by contacting TECOM G-3.

22) **School Overhead** List those billets, other than instructors, required to operate the school. Personnel on school overhead often perform curriculum development, test and evaluation, equipment maintenance, Company GySgt, 1stSgt, XO, CO, etc. If there is a need for more personnel (evaluators, curriculum developers, etc.) than listed on the T/O, include them here.

23) **Training/Education Support Requirements** Item 23 is used to list resource requirements other than personnel requirements defined in the previous two paragraphs. List all training/education support requirements specifically emphasizing the portions that exceed already on-hand items or quantities in the school's approved Table of Equipment (T/E) that are directly related to the course of instruction (e.g., training devices, Class V, operations, and maintenance funds). Additionally, consumables or locally purchased items should be identified here if deemed appropriate by the Commanding Officer/Director of the school to account for all items used by the school. Format is flexible, but should contain the following information: (a) Table of Authorized Material Control Number (TAMCN); (b) National Stock Number (NSN); (c) Unit of Issue (U/I); (d) Quantity on Hand, and Quantity Short (that will total quantity required); (e) Unit cost; (f) Extended cost (quantity required x unit cost). Increases in training/education support requirements are reviewed by TECOM (G-3 and Financial Management) for consideration in the planning, programming, and budgeting process. Although training/education support increases may be validated based on an approved CDD, the CDD itself will not generate a T/E change. Once approved, separate correspondence must be submitted to CG, TECOM (Financial Management) requesting a T/E change.

- If an approved T/E does not exist, list all training/education support requirements necessary to implement the course.

- The required format for a T/E item is the Table of Authorized Material Control Number (TAMCN), National Stock Number (NSN), Unit of Issue (U/I), Quantity On Hand, and Quantity Short (which will total quantity required), unit cost and extended cost (quantity required x unit cost). This information can be obtained for the Consolidated Memorandum Receipt (CMR) for the formal school/detachment.

- For facilities, identify the building(s), classrooms, or ranges by number and/or square feet.

- The required elements for listing Class V items: Department of Defense Identification Code (DODIC) number, ammunition type, number of rounds per student, number of demonstration rounds per class, total number of rounds per class, total number of rounds per year. TECOM (G-4 Ammo Section) reviews Class V items by ensuring the round count matches the round count contained in the applicable ITS order/T&R manual.

24) **ITS Task List** Record the tasks/events taught in the course. This task list must be an approved ITS task list. If an approved ITS does not exist, include a locally generated task list (See Chapter 1, Analysis phase for the steps involved in generating a task list).

- **Recommended Changes to ITS** The CDD is one document for the formal school/detachment to recommend changes to ITSs. If a review of the approved ITS task list reveals ITS tasks that should be deleted or added, these recommended revisions must be recorded here. Recommendations should be based on a thorough review of the ITSs/T&Rs and any available course or job documentation obtained by the formal school/detachments concerning the Military Occupational Specialty (MOS)/job. When recommended revisions to ITSs are submitted with a CDD, this initiates the process with TECOM (GTB/ATB) for getting changes made to the ITSs.

- **Added ITS** ITSs that are recommended for addition are written as ITS/T&R task behaviors and placed in the task list under the duty area and in the recommended order in which they would appear if they were approved. If a new duty area is recommended for addition, it should be named and include the new ITS/T&R components. An appropriate ITS/T&R designator number for each new ITS/T&R event should be included representing the MOS.

☑ **Deleted ITS** For every recommended addition and/or deletion to the approved ITS task list, justification must be provided. Justification is inserted into the CDD Notes portion of the CDD immediately following item #24. Each ITS task behavior designator is listed, followed by the justification for the recommended change. For guidance concerning justification, contact TECOM (GTB/ATB).

☑ **Approval Procedures**. In their review of the CDD, TECOM (GTB/ATB) will approve or provide guidance concerning the recommended changes to the ITS task list. If the recommended changes are approved, the ITS task list is renumbered accordingly, using the next available task number within the duty area. The POI will then be developed based on the new approved ITS task list and its numbering system. If TECOM (GTB/ATB) does not approve the recommended changes, the formal school/detachment will be provided with guidance to follow.

d. **Following CDD Approval** Once the CDD has been approved, the approved task list is recorded in Appendix B of the POI. When submitting the POI for approval, record in item #24 the following wording "Refer to Appendix B for task list."

- **Optional Items in a CDD** Optional items are those items that the formal school/detachment feels amplify or clarify the information contained in the CDD. These items may be included in the CDD and POI as appendices. Contact TECOM (GTB/ATB) for guidance before including additional optional items. Examples of optional items include the sequencing of the lessons, training/education support requirements, complete listing of TLOs/ELOs, student performance evaluation checklist, instructor prerequisites, etc.

e. **Submission and Approval of CDD** Formal schools/detachments submit their CDD for staffing and approval to CG, TECOM (GTB/ATB) as follows:

- **New Course of Instruction** A formal school/detachment will submit a CDD and a cover letter requesting approval to add a new course. The cover letter should address why the course is required, what deficiencies it will correct, and why it should be conducted in a formal school setting.

- **Revised Course of Instruction** The CDD requires resubmission only if there is a change to one of the previously approved elements of the course. The current TECOM approval authority for the CDD must be cited in the forwarding correspondence.

3702. PROGRAM OF INSTRUCTION (POI)

The POI serves as a formal school/detachment plan for implementing and evaluating a formal course of instruction. A POI is the management tool for conducting a course. At a minimum, a formal school/detachment must have a locally approved (by signature of school/detachment commander) POI for every course of instruction it delivers. For each school, the POI is used as an important element in the documentation and historical record that reflects the evolution of a course. Accordingly, a copy of the POI is maintained at the school to document this evolution (see Appendix B for an abbreviated version of a POI).

1. POI Development Process Using the information from the approved CDD, the formal school will develop the POI. MCO 1553.2_, Management of Marine Corps Formal Schools and Training Detachments, contains POI submission and approval requirements and procedures. The curriculum module of the Marine Corps Automated Instructional Management System (MCAIMS) is used to develop the POI.

2. POI Content Requirements Development of the POI primarily involves the consolidation of materials produced during the Analysis and Design Phases. MCO 1553.2_ mandates minimum POI content requirements. TECOM (GTB/ATB) must clear any additional items to the POI for inclusion prior to submitting the POI.

3. POI Requirements Listed In Order:

a. **Title Page** The title page provides information necessary to identify the document. This includes the course title, SSIC, school name/address, and effective date. The effective date is left blank until the POI is approved, then the date approved is recorded. Each time a revised POI is approved, the new approval date is recorded.

b. **Certification Page** The signed certification page signifies that the CG, TECOM has reviewed and approved the POI. The approved POI directs the school commander to implement the course of instruction. For local approval, the school commander will sign a local certification page.

c. **Record of Changes Page** The record of changes page is a chronological log of all changes made to a POI. Each entry must indicate the change number, date of change, date received, date entered, and the signature of the individual entering the change.

d. **Table of Contents** This table details the content of the POI and is arranged by section number and section title. The table of contents should include by section the following: CDD, Summary of Hours, Scope of Annexes, Concept Cards, Student Performance Data, and Distribution List.

e. **CDD** Section I of the POI consists of the CDD with preface. The preface should include a brief purpose statement and the address where comments and recommendations concerning the POI may be sent. The 24 elements of the CDD provide a summary of the course.

f. **Summary of Hours** Section II of the POI consists of a summary of the course. Included are two items: a breakdown of the academic and administrative hours, and revision data.

- All academic hours are organized by using annexes. Annexes organize the concept cards contained in the POI into chapters or topic areas. Annexes can duplicate the duty areas ITS/T&R are organized by or they may be some other organizational grouping determined by the developer of the POI. Annexes A-Y are for academic concept cards and annex Z is reserved for administrative concept cards. Due to the MCAIMS' automatic calculations of academic and administrative hours from each concept card, the totals shown in this paragraph will match the instructional hours represented on the concept cards and the curriculum breakdown in the CDD (items #9 and #11).
- Revision data is listed by lesson designator, lesson title, and lesson time expressed in hours. The previous and current lesson designators and hours are listed (when applicable) and rationale is provided for each change to these items.

g. **Scope of Annexes** The scope of annexes carries a subheading, academic subjects, and details a description of the scope of each annex contained in the POI. If there is a difference in the scope between the conduct of the course during peacetime and mobilization, it must be annotated here.

See section 3200 concerning concept cards.

h. **Concept Cards** Section IV of the POI is made up of the concept cards. Concept cards comprise the bulk of the POI and provide a snapshot of all lessons, examinations, and administrative events. An introduction is provided to explain the description of the contents of the concept cards, the location of learning objectives report, and summaries of instructional hours.

i. **Student Performance Evaluation** Section V of the POI documents the scope of the evaluation, standards for successful performance, and evaluation procedures. Refer to the school SOP and MCAIMS users manual for guidance on specific evaluation procedures. Student evaluation must be detailed and include, at a minimum, the evaluation philosophy (mastery/non-mastery/GPA), methods of evaluation (e.g., written, performance, remediation), Fitness Reports (if applicable), Pro/Con marks (if applicable), disposition of academic failures (recycle/MOS re-designation procedures).

4. Distribution List This section is automatically generated by MCAIMS.

SECTION 8

3800. ASSEMBLE A MASTER LESSON FILE

A Master Lesson File (MLF) is a compilation of living documents that are kept in the school to provide everything needed to conduct a lesson. The MLF is kept at the formal school/detachment and serves as the central repository for all the instructional and supporting materials for a given lesson. A MLF must exist for each lesson taught. All copies of materials that are created for distribution must come from the MLF. Since the MLF is a living document, it can be altered to fit current doctrine or updated to provide better media, more complete handouts, new methodology, etc. The MLF is constantly being improved and is the most up-to-date file on what is occurring at the school for a particular lesson. Thus, it provides accountability, documents the use of school resources, and most importantly, **provides continuity**.

3801. MINIMUM REQUIREMENTS

In an academic MLF, nine items must be present. However, inclusion of supplemental materials and media (i.e. actual item object) in the MLF may not always be practical; therefore, are not always required to be present. For each of these items, there will also be a completed checklist. In a lesson purpose class, the first two items are omitted.

1. Learning Analysis Worksheet The Learning Analysis Worksheet (LAW) is required in the MLF because it documents the transition between the ITS tasks events and learning objectives.

2. Learning Objective Worksheet The Learning Objective Worksheet (LOW) is placed in the MLF because it describes the anticipated learning outcome, provides a test item for each Learning Objective (LO), and contains the selection of methods and media for that specific LO.

3. Concept Card A concept card is placed in the MLF because it is a quality control document. The concept card is always located in the Program of Instruction (POI), but for quick reference will be placed in the MLF. The concept card provides a quick snapshot of the class (i.e. learning objective(s), method, media, instructor to student ratio, references).

4. Operational Risk Assessment Worksheet (ORAW) The ORAW documents the school plan to conduct training in the safest manner possible. The ORAW document the 5-step Operational Risk Management process as it relates to the lesson. Refer to appendix B and MCO 1553.2_ for further guidance on the preparation of the ORAW.

5. Instructor Preparation Guide This document is used to guide the instructor in preparing for the lesson.

6. Lesson Plan No MLF is complete without a lesson plan. The lesson cannot be conducted without a lesson plan. The lesson is written in such detail that an alternate instructor, with minimal preparation time, could effectively deliver the lesson.

7. Student Outline The student outline will be contained in the MLF.

8. Supplemental Student Materials Any other materials used to enhance instruction or student learning during the class should be maintained in the MLF. If the actual copies are not maintained in the MLF, a locator sheet is used to inform the instructor where to locate these materials.

9. Media Media and/or a list of supporting papers are placed in the MLF. If the actual media are not contained in the MLF (e.g., films, tapes, wallcharts), then, supporting papers that list the media required and where they are located should be included. It may be possible to provide paper copies of slides, transparencies, or wallcharts in the MLF. Any copyright authorizations related to the media should also be filed here.

3802. OPTIONAL COMPONENTS

Each formal school/detachment's SOP will dictate optional components that must be kept in a MLF.

Some examples of optional components are:

1. ITS Extract An extract from the applicable Individual Training Standard (ITS) may be included as a foundation to the material being taught.

2. Approval Signature Most schools require verification by a supervisor in an official capacity for any or all documents found in the MLF. This can be placed on a separate form that depicts whose signature is necessary for approval.

3. Other Course Related Materials Any other item dictated by local SOP should be contained in the MLF. These items may include items such as test, training area requests, and other items applicable for use during the lesson that aid in the delivery or evaluation of that particular class.

3803. STEPS FOR ASSEMBLING A MASTER LESSON FILE

STEP 1

REVIEW MCO 1553.2 AND LOCAL SOP

Review the current copy of MCO 1553.2 (Marine Corps Formal Schools and Training Centers Order) along with your school's SOP to determine the requirements of the MLF.

STEP 2

GATHER DOCUMENTS AND CHECKLISTS

Gather all documents along with their blank checklists once you have determined your requirements.

STEP 3

COMPLETE THE MLF CHECKLIST

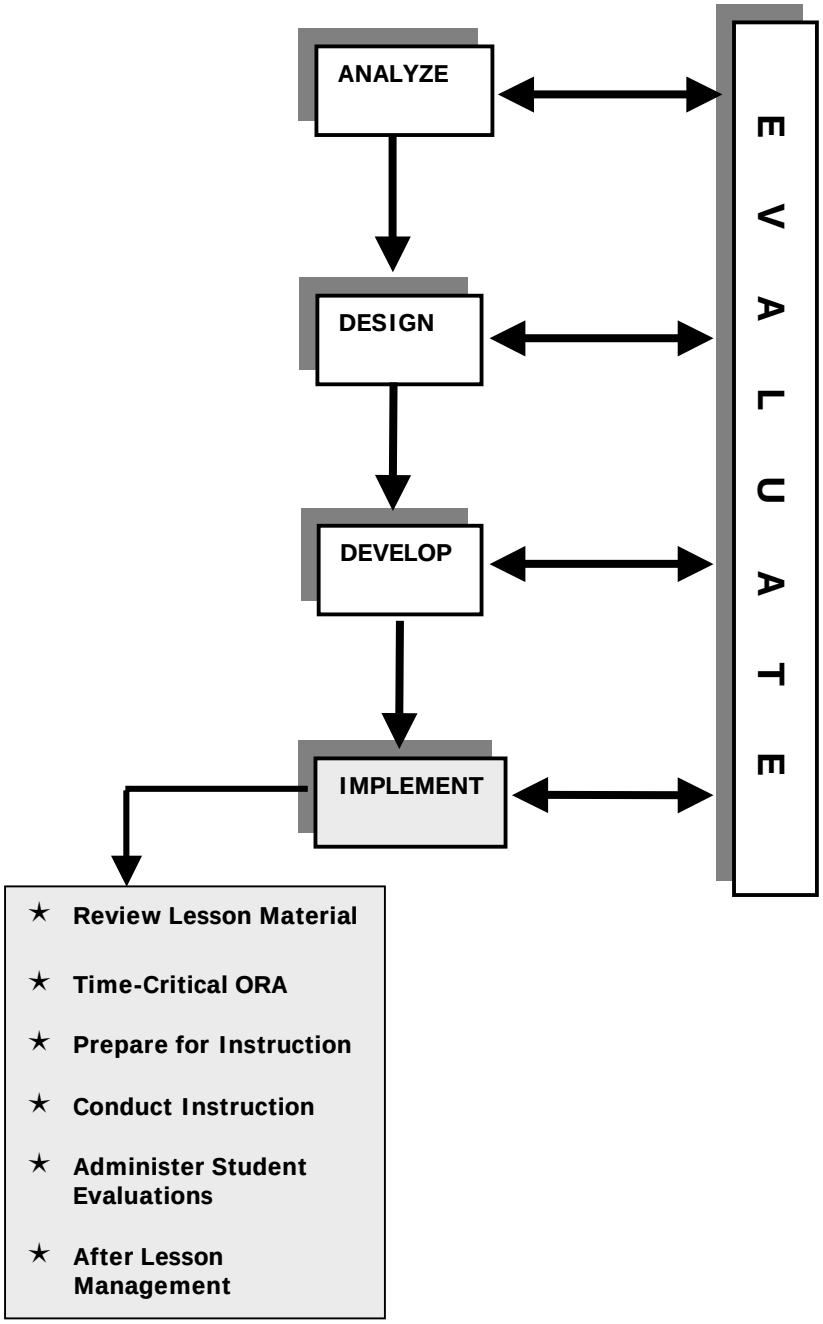
Complete checklists for each component of the MLF. Sample checklists for each component may be found in APPENDIX C of this Manual. Similar or additional checklists to be used for the optional MLF components may be mandated by local SOP.

STEP 4

ARRANGE EACH DOCUMENTS IN THE MLF

Arrange each document in accordance with your checklist in the MLF. Ensure each checklist is completed to ensure that all required items are included in the MLF.

IMPLEMENT PHASE



In Chapter 4:

Chapter 4

4000. INTRODUCTION

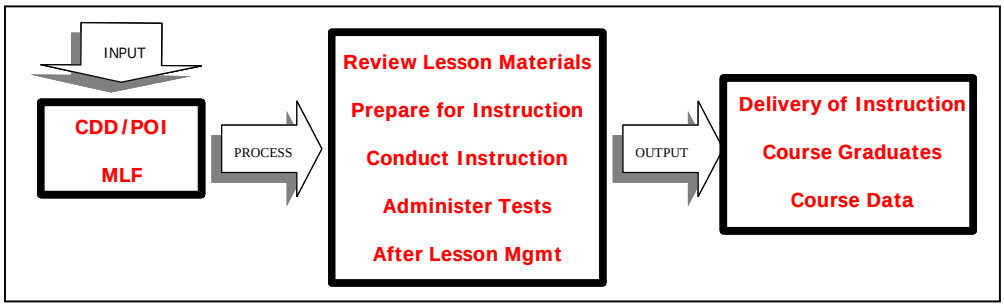
During the Implement Phase the following is accomplished: reviewing the lesson materials, preparing for instruction, conducting instruction, administering student tests, and performing after-lesson management. This includes the instructor reviewing the training schedule and, class materials (to include tests), preparing personnel and the training environment, and conducting rehearsals. Once the instruction has been delivered, the instructor must administer student evaluations to determine if the learning objective has been met. The instructor must conclude the instruction by completing an After Instruction Report (AIR) to document the course data for later use in the Evaluation Phase.

4001. PURPOSE

Using the curriculum produced during the Develop Phase, the instructor executes the instruction during this phase. The purpose of the Implement Phase is the effective and efficient delivery of instruction to promote student understanding of material, to achieve student mastery of learning objectives, and to ensure a transfer of student knowledge and skills from the instructional setting to the job. This is accomplished by effectively implementing the POI that was designed, developed, validated, and approved during the previous phases.

The Implement Phase is made up of five separate sections, each of which has a specific purpose.

1. **Review Lesson Materials** This section provides guidance on reviewing lesson plans, student materials, media, Operational Risk Assessment Worksheet (ORAW), Instructional Preparation Guide (IPG), and tests when preparing to conduct a lesson.
2. **Time Critical Operational Risk Assessment** The Time-Critical Operational Risk Assessment addresses preparing and reacting to changes in the instructional environment that affect safety.
3. **Prepare for Instruction** This section addresses preparing the instructional environment, rehearsing, and preparing for instructor evaluations.
4. **Conduct Instruction** This section addresses effective communication, steps in conducting a lesson, and how to employ instructional methods.
5. **Administer Student Tests** A step-by-step process for administering student tests is provided in this section.
6. **After Lesson Management** This section provides the responsibilities of an instructor after the lesson.



SECTION 1

4100. REVIEW LESSON MATERIALS

Reviewing lesson material involves all those activities that instructors must perform before preparing and conducting instruction. Instructors must have a clear understanding of all aspects of the lesson. This is accomplished by reviewing the course/training schedule, the MLF, and tests. By reviewing these items, the instructor can identify any conflicts, questions, or potential problems before the rehearsals begin. More importantly, the instructor can make required adjustments prior to delivering the instruction to the students. The instructor must ensure the lesson plan, student materials, and media all have the same information.

4101. REVIEW COURSE/TRAINING SCHEDULE

The instructor should review the schedule as early as possible before instruction begins. This allows the instructor ample time to deal with any conflicts or problems. By reviewing the schedule early, the instructor has time to schedule resources (i.e., ranges, weapons, or transportation), rehearsals (i.e., a dress rehearsal in the instructional setting), and any administrative requirements (i.e., printing of student materials).

4102. REVIEW LESSON PLAN

Detailed lesson plans ensure that the instructor has all the critical information needed to maximize student learning. The purpose of reviewing the lesson plan is to ensure it contains all of the required components; to match the learning objectives to the information in the lesson plan; and to personalize the lesson plan to the instructor's style of delivery. After reviewing the lesson plan, the instructor should fully understand lesson content and have confidence in the detailed script that allows for the smooth and effective delivery of instruction.

1. Lesson Plan Personalization The instructor will be provided with the approved lesson plan for the block of instruction. The instructor personalizes the lesson plan, tailoring it to his or her style of teaching. Lesson plan personalization allows the instructor to make the class unique without deviating from the approved content. Personalization includes adding subject matter details, related personal experiences, and discussion topics which may be needed to cover the topic in greater depth. Personalization also includes the addition of notes to indicate when to stress a point, relate a personal experience, or use an example or analogy.
2. Subject Matter Detail Use this type of information to provide technical data such as purposes, descriptions, facts, operations, and functions. Course reference materials provide this information.
3. Instructional Techniques Use carefully written questions, well-planned media, or additional student/instructor activities to enhance the lesson.

4. Personal Experience Relate personal on-the-job experiences to the lesson to increase student interest. Relating personal experiences has the positive effect of reinforcing the practical application of the material. It also serves to increase student interest and motivation.

5. Examples and Analogies When possible, support main points of the lesson plan by examples and analogies to simplify the concepts or ideas being taught. Use them as a part of personalization for each lesson. For example, if the lesson is on the way sound waves travel through air, but the class has difficulty understanding that concept, then perhaps an analogy, such as "it is similar to the way ripples travel through water after a stone is dropped," will help them understand.

4103. REVIEW STUDENT MATERIALS

Student materials assist the instructor in the delivery of instruction by providing tools that stimulate the learner and reinforce key concepts. An instructor influences the transfer of learning by the way the content of the Master Lesson File (MLF) is used. There are two types of student materials: student outlines and supplemental student materials. All student material must be reviewed to ensure they match and support the lesson. Using outdated and irrelevant materials must be avoided at all cost. The students' performance and motivation will suffer when knowledge and skills are received that no longer pertain to the job.

1. Student Outlines The student outline is the primary document that supports the instruction. This outline provides the student with a general structure to follow during the class and a conceptual framework that highlights the main ideas of the class. The primary purpose for reviewing the student outline is to ensure it is written in proper terms for the student, not the instructor, and to verify that it contains all required components.

2. Supplemental Student Materials Supplemental student material is any material, in addition to the student outline, provided to the student prior to or during instruction. Supplemental student materials may include advance handouts to prepare the student for class (e.g., orientation material), answer keys to quizzes, additional articles for reading, and reference materials (e.g., technical manuals, graphs, charts, formulas, figures, maps). The use and number of supplemental student materials is optional, and they can be presented in any format that will be easily understood by the student. The difference between supplemental student materials and classroom media is that students take ownership of the former, while the latter remains the property of the school. The primary purpose for reviewing supplemental student materials is to ensure the information does not contradict the information contained in the student outline and that it is an essential tool required to meet the learning objective.

4104. REVIEW MEDIA

Instructional media can come in many forms. The primary purpose for reviewing media is to ensure that they match the information in the lesson plan and are visible to the students in the classroom.

4105. REVIEW OPERATIONAL RISK ASSESSMENT WORKSHEET (ORAW)

The purpose of the ORAW is to record the results of an Operational Risk Assessment. During the Develop phase of the SAT, an ORAW is developed and then maintained in the Master Lesson File (MLF). An ORAW is required for every lesson. However, some lessons may not have any hazards identified for the lesson, in which case the ORAW will state "No Identified Hazards." Through the ORA, identifiable hazards are listed, assessed, risk decisions are made, controls are developed and placed in the lesson plan, and supervision of the controls is determined. Instructors must identify the ORA and review it for safety issues pertaining to the lesson prior to the conduct of the lesson. The ORA must also contain the Cease Training Criteria (CTC) for the lesson. These criteria detail the circumstances when training must be stopped. The CTC is specified in the safety brief of the introduction in the lesson plan. When there are CTC associated with a practical application or other method, it is reiterated prior to the practical application. For each safety control identified on the ORAW, a corresponding control must be in the lesson plan where applicable. It is absolutely imperative that this information is reviewed for accuracy to ensure the safety of the students during the lesson. Ensure that the ORAW is valid by looking at the approving signature and date. Any problems concerning the ORAW (such as acquiring resources necessary to implement controls, etc.) must immediately be brought to the attention of the appropriate authority.

4106. REVIEW INSTRUCTOR PREPARATION GUIDE (IPG)

The Instructor Preparation Guide is a required element of the Master Lesson File (MLF). This checklist is created to provide the instructor with information that is critical to the preparation for implementing the lesson. Detailed information is given so that the instructor understands what resources are necessary for the lesson. Much of the information provided under administrative information is copied from the concept card. Though this checklist is an MLF item, instructors can make a copy so that they can check off items when preparing for the lesson.

4107. REVIEW STUDENT TEST

The primary purpose for reviewing the student test is to ensure the instructor has a complete understanding of how the students will be evaluated. Every block of instruction begins with an introduction. One of the steps in the introduction is to explain how the students will be evaluated. By reviewing the test, the instructor will also determine if the test items are supported by the content of the lesson plan, instructional materials, and student materials. The instructor must never use this information to teach specific test items or questions.

SECTION 2

4200. TIME-CRITICAL OPERATIONAL RISK ASSESSMENT (ORA)

When instructing in the classroom, the need for Operational Risk Management (ORM) is paramount. Instructors are entrusted with the safety of the students. For this reason, ORM is needed in every aspect of training, whether the training is in the classroom or out on the machinegun range. Hazards still exist in the instructional environment. That is why the curriculum developer at the schoolhouse has done an in-depth Operational Risk Assessment (ORA) and placed a report of the assessment in the Master Lesson File (MLF). Though the in-depth ORA is already done, the instructor can have an impact on controlling risk by conducting a Time-Critical ORA when applicable.

4201. IDENTIFY CHANGE(S)

Change has been called the “Mother” of all risk. Changes can occur during the preparation of the lesson, during the conduct of the lesson, and during the administration of tests. When talking about changes, what is really being discussed is what can happen in the instructional environment to change the hazards documented in the in-depth ORA that was completed by the curriculum developer. Remember, the instructor is in charge of the class and must ensure the safety of the students. There are several tools that can be used to aid the instructor in preparing for the lesson. Change Analysis and the What If Tool (WIT) will help identify changes or potential changes. Once a change has been identified, a determination can be made to whether the associated hazard is a high or low risk. If the risk is determined to be high, then training is ceased to ensure the safety of the students. If the risk is determined to be low, then the instructor applies a Time-Critical ORA to ensure the safety of students and continue with the training. If possible, enlist the aid of experienced instructors when using these tools. Their experience can shed light into areas an inexperienced instructor may not have thought about.

1. Change Analysis Change Analysis is an excellent tool for use in time-critical applications where change has been introduced. It is very simple to use: simply look at a training event and ask, "What is different?" As the name implies, Change Analysis allows the identification and assessment of hazards resulting from planned or unplanned changes to a lesson. Case in point would involve an event that has been thoroughly planned and briefed, but something or somebody introduced some change and the whole plan fell apart. Examples of when to apply change analysis include when assessing the impact of:

a. Resource cuts, to include time, dollars, people or other resources.
b. Changes in weather or the environment.
c. Changes to equipment or supplies, such as a HMMWV truck instead of a 7-ton truck.
d. Changes to the location of a classroom or the number of students attending class.

2. What If Tool (WIT) Asking the question, "What If?" may possibly identify additional hazards not even considered by the in-depth ORA. To use the WIT, assume that Murphy's Law applies. Murphy's Law states, "What can go wrong, will go wrong." Remember to consider possible mistakes or problems. Look at the worst-case scenario, even if it does not seem likely to happen. Also, consider the mistakes or problems that are much more likely to happen, but may not be as detrimental. "What-If" questions can be formulated around human errors, process upsets, and equipment failures. These errors and failures can be considered during normal operations and during training activities. The questions could address any of the following situations:

a. Failure to follow procedures
b. Operator inattentive or operator not trained
c. Equipment failure
d. Instrumentation calibrated wrong
e. External influences such as weather, fire
f. Combination of events such as multiple equipment failures

Experienced personnel are knowledgeable of past failures and likely sources of errors. That experience should be used to generate "What-If" questions.

4202. APPLY THE 5-STEP PROCESS

Time-Critical Risk Management will suffice only when the risk is low. It is used when there is no need to develop a written Risk Assessment for an evolution, such as would be required for a Deliberate or In-depth level of ORM (refer to Chapter 3, Section 3300 for more information on the In-depth ORA and the 5-step ORM process). It is also particularly helpful in choosing the appropriate course of action when an unplanned event occurs during the execution of a planned operation or training course.

Applying

The Time-Critical level of Operational Risk Assessments is employed by experienced personnel to consider risk while making decisions in a time-compressed situation. In the steps of Risk Management, identify the hazard(s), make an assessment by examining probability and severity associated with the hazard, and use the Risk Matrix to determine a Risk Assessment Code (RAC). Next, the instructor must make a risk decision. This only refers to instruction that is not of a high-risk nature, to which the instructor can apply the five-step process. If the risk is low and the decision is to continue training, then the instructor must implement some form of control and supervision to reduce the risk. This has already been done for the instructor in the In-Depth ORA worksheet. However, changes do occur and that is when the instructor needs to apply a Time-Critical ORA. Clearly, the assignments of risk are subjective; different people may assign different values. The point is to increase Situational Awareness so that a mishap or incident is more likely to be avoided.

SECTION 3

4300. PREPARE FOR INSTRUCTION

The preparation portion of the Implement Phase involves all those activities that instructors and support personnel must perform to get ready for delivering the instruction. To maximize the transfer of knowledge and the development of skills by the learner, instructors must rehearse the lesson, prepare instructional materials, and prepare the instructional environment. This is accomplished by organizing the instructional material and environment in a manner that promotes the smooth exchange of information between the instructor and the students. Prior to conducting instruction, instructors should think about how to influence the following: transfer of knowledge and skills, the instructional environment, delivery, facilitation techniques, use of media, and questioning techniques.

4301. INSTRUCTIONAL ENVIRONMENT

Prior to delivering instruction, the instructor must prepare the instructional environment for an organized and smooth presentation to maximize the transfer of knowledge and skills. The instructional environment refers to the instructional setting (classroom), media/equipment, support personnel, student materials, and the administrative functions the instructor must perform.

1. Prepare Instructional Setting (Classroom) The instructor must ensure that the instructional setting replicates the job setting as much as possible. This is achieved by organizing and placing required equipment or supplies, as they would be in the job setting. The instructor must also ensure that the instructional setting is conducive to learning. This is accomplished by ensuring the following:

a. **Lighting and ventilation are adequate, media equipment is accessible, and the climate control is functioning properly.**

b. **Chairs and desks are available for each student.**

c. **Unnecessary distractions are removed.**

d. **If an outdoor area is to be used, the instructor must survey the area to ensure it can be prepared per the specific lesson plan and local Standing Operating Procedure (SOP). An alternate site should be designated in the event the primary site cannot be used.**

e. **Ensure that all ORM and safety considerations have been addressed.**

2. Prepare Media/Equipment The instructor must gather and set up all the instructional equipment and media required for the presentation of the lesson. Equipment can include items such as Digital Video Disc (DVD) players, Liquid Crystal Display (LCD) projectors, computers, etc. Media can include board media (chalkboards, dry erase boards, etc.), established media (actual item/object, printed materials, etc.), computer media (Computer-Based Tutorials (CBT), Interactive Media Instruction (IMI), etc.), and multimedia (computer aided graphics, audio, video, etc.). Equipment and media preparation should include a review of the following requirements:

a. **All the required equipment is operational. If the equipment cannot be repaired or replaced, an alternate media with equipment must be obtained.**

b. **The media must be easily seen and heard from any part of the instructional area.**

c. **The media are in good condition. The media are appropriate to the subject matter and target audience.**

3. Brief Support Personnel Support personnel include assistant instructors, demonstrators, role players, Corpsmen (when applicable), and any other personnel who will be involved in the presentation or support of instruction. The instructor must brief support personnel so that each person's role is clearly understood. Additionally, the learning objectives of the lesson and any needed preparations for instruction must also be briefed.

a. **The primary instructor is responsible for ensuring that all personnel are informed when to meet. Some personnel may need to be at the instructional area early to secure and set up equipment or to have student materials in place prior to the start of the class.**

b. **Demonstrators should be briefed on their roles and, if time permits, a walk through of the demonstration should be conducted prior to instruction.**

4. Prepare Student Materials The instructor must ensure that all materials required by the students are available, in good condition, and ready to be distributed. These may be student outlines (primary document that supports the instruction) or supplemental student materials (something other than the student outline that is retained by the student after instruction).

5. Perform Administrative Functions There are several administrative functions the instructor must address prior to implementation of instruction. The following is a list of some of these administrative actions:

a. Verifying the time and location of the class.

b. Obtaining the class roster.

c. Making arrangements for monitor/visitor seating in accordance with local SOP.

d. Ensuring appropriate security or safety measures have been followed.

e. Preparing all administrative paperwork for presentation.

6. Personal Appearance One of the last things to do before "stepping on the platform" is look in the mirror to check personal appearance. Whether military or civilian, an instructor must make sure that his/her attire is neat and professional. There is nothing worse than an instructor who appears before a class looking sloppy and unkempt, which in most situations distracts the learners' attention from the material.

4302. REHEARSALS

Most people perform best when they are well prepared. The success of any presentation is a direct result of the amount of work that went into preparing it. Rehearsal is the process in which an instructor practices delivering his/her lesson. Rehearsing the lesson will reveal the most effective wording, enhance the instructor's knowledge of the subject matter, ensure a smoother flow of the presentation, and increase the chances for success. Rehearsal also provides the instructor a gauge of how his or her delivery fits the allocated time for the lesson.

1. Types of Rehearsals The three types of rehearsals are: individual, small critical audience, and dress rehearsal. Each of these can stand alone; however, preparation is maximized when they are all conducted in sequence.

a. **Individual** The individual rehearsal requires the instructor to practice delivering the material alone. Individual rehearsals can take place anywhere, anytime, and at the convenience of the instructor. Some instructors rehearse on their way to work in their car, in the shower, or while watching television. It is recommended to videotape individual rehearsals when possible.

b. **Small Critical Audience** Upon completion of an individual rehearsal, the lesson should be presented to a small group of people. Emotional attitudes must be considered when selecting the audience. Ensure the people selected will provide constructive feedback. Peers make the best critical audience, but using family members at least provides an opportunity to rehearse in front of an audience. The instructor should be thick-skinned enough to accept feedback at face value. Tape this rehearsal if possible.

c. **Dress** The dress rehearsal should be the final rehearsal and most important of all rehearsals. By this point, every effort should have been made to remove any discrepancies in the lesson. This rehearsal should be accomplished in the instructional setting that will be used when the actual lesson is conducted. Rehearse with all media and equipment that will be used on presentation day. Also, make certain any assistant instructors or support personnel are available to rehearse during the dress rehearsal. As with the other two types of rehearsals, tape this if possible.

2. How to Rehearse There are several keys to remember when rehearsing.

a. **Avoid Memorization** Never memorize the lesson because it will give the presentation a canned effect that causes the instructor to appear robotic. Know the outline (conceptual framework), sequence, and the points to be covered, but do not memorize the lesson verbatim (word for word) from the lesson plan.

Below are some recommendations that can help avoid memorization:

1) **Read the lesson plan at least twice and highlight words or key phrases that need to be emphasized. If anything is unclear, request guidance from other instructors.**

2) **Research the technical manuals and references to broaden knowledge of the subject.**

3) **Review all supplemental material.**

4) **Print the media (3 slides per page) and write notes on the right hand side of the page. The notes can include key phrases from the lesson, examples, analogies, stories, or anything else that needs to be mentioned or accomplished when that particular slide is displayed. If using a turn chart or transparencies, write notes as well. Once the instructor is comfortable, rehearse without the notes.**

b. **Rehearse by Parts** If there is any part of the lesson that feels uncomfortable or needs more practice, rehearse that part separately until you gain confidence with the material and delivery.

c. **Rehearse for Criticism** After completing the previous step, rehearse the lesson for the sake of criticism in front of an audience. This audience should be fellow instructors or curriculum developers responsible for the development of the curriculum.

d. **Rehearse the Whole Lesson** After the instructor rehearses and is comfortable with the different parts, the lesson should be rehearsed from start to finish. An instructor can get a false sense of security when comfortable rehearsing only specific parts. This is essential to ensure that the lesson flows smoothly.

3. Evidence of Rehearsal The following are indicators of effective rehearsal. It is important to note that a lack of rehearsal may cause students to form negative opinions regarding the lesson, the instructor's professionalism and abilities, and the course or instructional program. However, proper rehearsal will produce the following positive results.

a. **Presentation Flows Smoothly** If the entire presentation flows smoothly, it is most likely due to instructor rehearsal. Conversely, if the presentation is choppy or disjointed, it can be presumed that the instructor did not rehearse appropriately.

b. **Instructor Appears Knowledgeable** When an instructor appears knowledgeable about the subject matter, it is evidence of rehearsal.

c. **Instructor Appears Comfortable** The next consideration is whether or not the instructor appears comfortable in the classroom. The instructor should know where all the equipment and media are located and the presentation should not be interrupted because the instructor could not operate the equipment or media. If the instructor appears relaxed while delivering the presentation, then he or she most likely spent enough time rehearsing.

d. **Time Limit** Further evidence of rehearsal is the effective delivery of the instruction within the time allocated. If the instructor remains within the time limit, then it is most likely due to rehearsal.

4304. INSTRUCTOR EVALUATION

Evaluation of instructors for the purpose of improving the quality of training is an ongoing process. All instructors should welcome the opportunity to be evaluated by others. Through this evaluation process, the instructor will receive feedback on strengths as well as those areas that need improvement.

1. Types Two types of instructor evaluations are conducted: content and delivery. Content evaluations are normally conducted by occupational field subject matter experts to verify the content qualifications of the instructor. Seasoned instructors, who have completed training at the Instructional Management Schools evaluate the instructor's ability to effectively deliver the training. Schools should contact the delivery experts at the IMS for specific delivery evaluation support. Further, school and detachment commanders can request a Curriculum Assistance Visit (CAV) from CG, TECOM (Training Management and Evaluation Section). The CAV team provides expert consultation on all aspects of the curriculum and instruction.

2. Scheduled or Unscheduled Evaluations may be conducted on a scheduled or unscheduled basis. Each method of evaluation has its advantages and disadvantages. A scheduled evaluation allows the instructor to prepare for the evaluation. It may also allow the instructor time to prepare a "show" that is not typical of usual performance. An unscheduled evaluation permits the evaluator to observe the instructor in a normal mode, which can result in a more realistic appraisal of the instructor. The drawback to an unscheduled evaluation is that an instructor may feel threatened and fail to perform at normal levels. Whether the evaluation is scheduled or unscheduled, the instructor should never switch from their usual performance for the benefit of the evaluator.

3. Preparing for Evaluation Instructors need to always be prepared for an evaluation, because they are always being evaluated when they instruct--by their students. Instructors should always view the evaluation process as an opportunity to gather information that will help them become more effective as instructors. A preliminary meeting with the evaluator will aid the instructor in preparation for the evaluation. The evaluator should answer any question the instructor may have and should provide the instructor with a copy of the instrument(s) being used during the evaluation.

SECTION 4

4400. CONDUCT INSTRUCTION

The effective and efficient delivery of instruction is a key point in the SAT process. Although the curriculum developer may have designed and developed the material so that it would maximize the transfer of learning, it is crucial that the instructor present the lesson in a manner that ensures comprehension and on-the-job application. While comprehensive planning and preparation early in the Implement Phase is necessary, it does not guarantee success. The instructor must communicate effectively, conduct the lesson, and manage the classroom during and after the presentation.

4401. EFFECTIVE COMMUNICATION

How an instructor presents information can influence student understanding, retention, and ultimately, on-the-job performance. In conducting instruction, the instructor should adhere to the following effective communication guidelines to ensure the maximum transfer of knowledge and skills to the students.

1. Communication Process Communication is the act of sending and receiving messages and providing feedback on those messages. The messages can be verbal, nonverbal, written, or physical--even a lack of action can be a message. Communication is an on-going process; however it is incomplete if the person with the message does not have a person to receive the message. Therefore, communication is always an exchange between two or more people. In Figure 4-1, the communication model "freezes" the process so that what happens during communication can be examined.

Communications Model

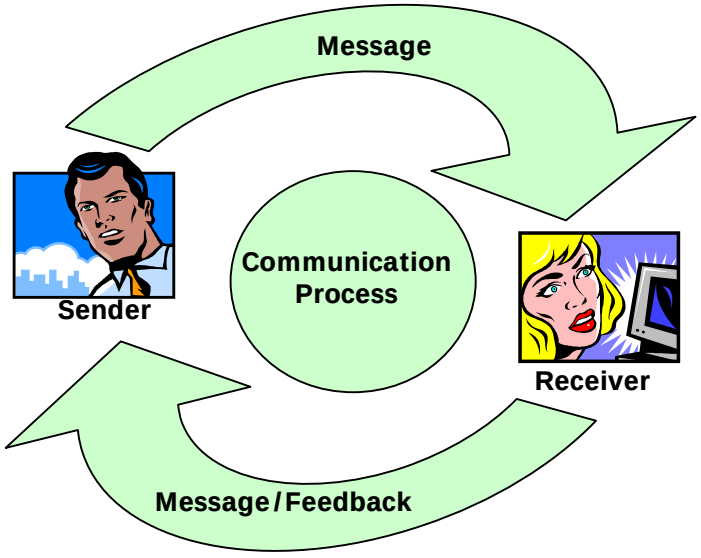


Figure 4-1 Communications Model

2. Communication Techniques The communication techniques that instructors must skillfully employ in the classroom are: **verbal, nonverbal, listening, and questioning**. These techniques dramatically affect the transfer of learning and the instructor's ability to maintain student attention.

1. Verbal
2. Non verbal
3. Listening
4. Questioning

a. **Verbal** There are eight speech techniques that instructors must be cognizant of when speaking.

1) **Volume** Volume is the loudness or softness of a speaker's voice. Be sure to adjust your voice to the acoustics of the room, the size of the audience, and the level of background noise. If an instructor speaks too loud, he or she could be perceived as overbearing. If an instructor speaks too softly, students will have difficulty hearing the material and may perceive the instructor as timid or unsure of the content. Remember that the speaker's voice always sounds louder to the speaker than to a listener. If students look puzzled, are leaning forward in their seats, or are otherwise straining to hear, then the instructor needs to talk louder.

2) **Rate** Rate involves the speed at which a person speaks. The best rate of speech depends partly on the mood the speaker is trying to create. If a person wanted to communicate the experience of mastering the crucible or to express the excitement upon graduation from boot camp, then a faster-than-normal rate may be used. If speech is too slow, it may put students to sleep. If too fast, students may lose track of the ideas that the instructor is trying to convey. Change the rate of delivery to get students' attention and to hold their interest. The rate of speech should be governed by the complexity of the subject and the emotion to be expressed.

3) **Dialect** Most languages have dialects, each with a distinctive accent, grammar, and vocabulary. Dialects are usually based on regional or ethnic speech patterns. These dialects affect the way people talk in different parts of the country. For example, in the southern U.S., parents may tell their children to stop "squinching" their eyes while watching television and to go clean up their rooms "rat" now. There is no such thing as right or wrong dialect. However, it can be troublesome for the instructor when the audience does not share that dialect. In such a situation, this may cause listeners to make negative judgments about the speaker's personality, intelligence, and competence. Even worse, students may not be able to understand the material being taught.

4) **Pronunciation** Pronunciation is the accepted standard of sound and rhythm for words in a given language. Below are some of the most frequently mispronounced words in the English language:

Word	Common Error	Correct pronunciation
genuine	gen-u-wine	gen-u-win
arctic	ar-tic	arc-tic
nuclear	nu-cu-lar	nu-cle-ar
February	Feb-u-ary	Feb-ru-ary

Every word leads a triple life: it is read, written, and spoken. Most people recognize and understand many more words in reading than they use in ordinary writing and about three times as many as occur in spontaneous speech. This is the reason for occasionally stumbling when speaking words that are part of reading or writing vocabularies. In other cases, commonplace words may be mispronounced out of habit. If there are any doubts about the proper pronunciation of certain words, check the dictionary or listen to someone say it properly.

5) **Articulation** Articulation is the delivery of particular speech sounds. Sloppy articulation is the failure to form particular speech sounds distinctly and carefully. Most of the time poor articulation is caused by laziness. Words are habitually chopped, slurred, and mumbled, rather than enunciating plainly. Though it is known that "let me" is not "lemme," "going to" is not "gonna," and "did you" is not "didja," yet we persist in articulating these words improperly. If sloppy articulation is used, work on identifying and eliminating common errors so that thoughts and ideas can be effectively expressed to students.

6) **Force** Use force by emphasizing the correct word or syllable. Placing emphasis on different words or syllables can change the meaning of a sentence. Practice placing emphasis on the underlined word in the following sentences: Why did you join the Marine Corps? Why did you join the Marine Corps?

7) **Inflection** Inflection refers to changes in the pitch or tone of a speaker's voice. It is the inflection of the voice that reveals whether a question is being asked or a statement is being made or whether a person is being sincere or sarcastic. Inflections can also make a person sound happy or sad, angry or pleased, dynamic or listless, tense or relaxed, interested or bored. If all sentences end on the same inflection (upward or downward), work on varying pitch patterns so they fit the meaning of the words. Inflection is one of the keys to expressing something emotional, persuasive, or convincing. Using inflection can make the difference between just saying words and making ideas meaningful.

8) **Pause** Learning how and when to pause is a major challenge for instructors. Even a moment of silence can seem like an eternity. As confidence is gained, however, it will be discovered how useful the pause can be. It can signal the end of a thought, give students a chance to absorb the material, give a speaker an opportunity to concentrate on the next point, and lend dramatic impact to a statement. Unfortunately, many times pet words are used in place of a pause, such as "um," "OK," "er," and "uh." These can become extremely annoying and distracting to students. To minimize the use of pet words, be familiar with the material, be well rehearsed, and make a conscious effort to use a natural pause in its place.

b. **Nonverbal Communication (Platform Behavior)** Communication is not complete without the nonverbal signals that complement verbal communication. The factors of posture, movement, nervousness, gestures, facial expressions, and eye contact can contribute to, or hinder, the communication process.

1) **Posture** Posture is very important; it shows enthusiasm for the subject. Posture is referring to platform stance. It should be comfortable without being slouchy. Do not lean on the lectern. In fact, it is best to stay completely away from the lectern in classroom instruction. Remember to stand erect with confidence.

2) **Movement** Move with a purpose. Is movement excessive? Is there a reason for movement? Movement can attract the attention of the listener. Move to convey a thought or as an aid in transitions. The basic rule in use of movement is moderation. Avoid: moving constantly, staying anchored to the podium, standing in one spot, blocking media, dragging feet, swaying back and forth.

3) **Nervousness** Some nervousness or anxiety is natural and normal. Nervousness causes poor voice techniques and mannerisms.

Overcome nervousness by:

- **Focusing on student learning.**
- **Rehearsing the lesson.**
- **Having a positive mental attitude.**
- **Relaxing and enjoying teaching.**
- **Being organized.**

4) **Gestures** Gestures are the motions of instructor's hands or arms. The primary rule is this: The gestures made should not draw attention to the instructor or distract from the message. Gestures should appear natural and spontaneous, help to clarify or reinforce ideas, and be suited to the audience. Gestures tend to work themselves out as experience and confidence is acquired. Avoid: flailing arms about, rubbing hands, cracking knuckles, slapping legs, toying with rings, or any other distracting motions. Think about communicating with students and gestures will take care of themselves just as they do in conversation.

5) **Facial Expressions** Facial expressions can reinforce, modify, or even contradict the spoken word (showing an instructor's thoughts and feelings). Instructors that appear relaxed and express enthusiasm in the subject create a bond with their students and make them feel comfortable (e.g., a smile indicates pleasure). Expressionless instructors are usually unprepared or nervous, focusing too hard on their delivery vice students, uninterested in the subject, or not attempting to make learning fun.

6) **Eye Contact** The use of the eyes is probably the most meaningful channel of nonverbal communication available. An instructor's eyes convey thoughts and feelings and can open communication, prolong communication, or cut off communication. As eye contact is established, remember to:

- **Be alert** Be alert for student reactions. Can they hear? Do they understand? A stare used in conjunction with silence can be quite useful in gaining the attention of misbehaving or inattentive students.
- **It isn't enough to just look at listeners** How the instructor looks at students also counts. A blank or intimidating stare is almost as bad as no eye contact at all.
- **Try to establish eye contact with the whole class** Some common errors are darting the eyes around the room, looking at the floor or demonstrators vice the audience, or looking at one part of the audience while ignoring the rest. The rule of thumb is to hold the eye contact until communication occurs.

c. **Listening** Look at Figure 4-2: notice that on an average day, 9% of our time is spent writing, 16% is spent reading, 30% is spent speaking, and the major portion, 45%, is spent listening. Listening takes in more information and is used more than reading and writing combined.

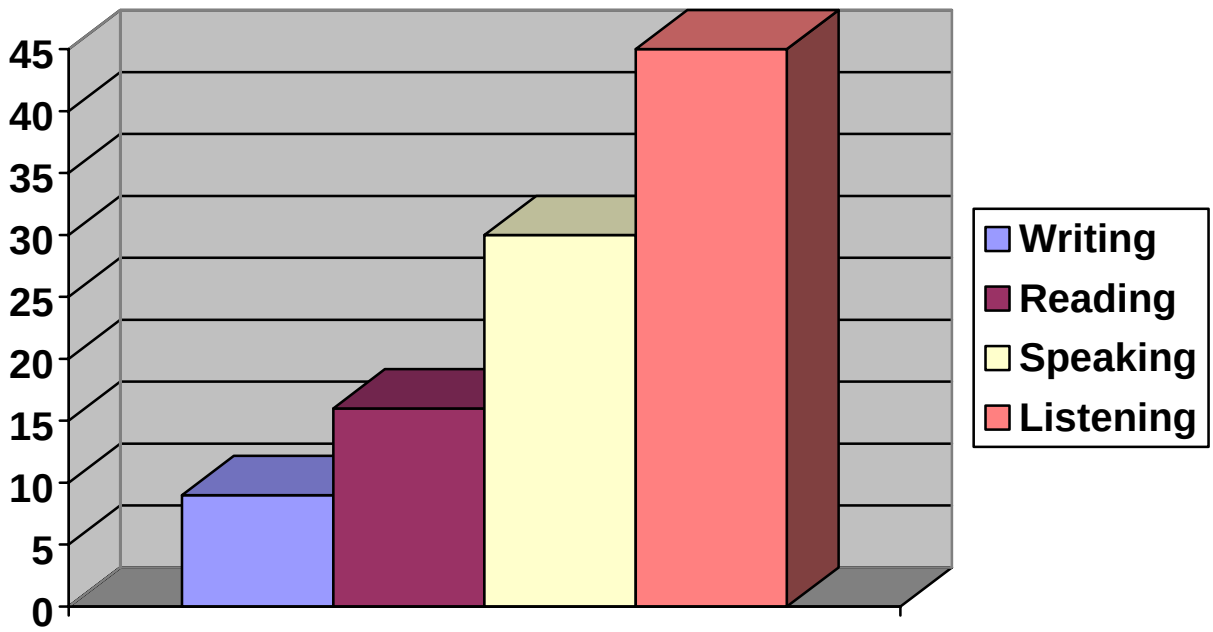


Figure 4-2

1) **Definition** Listening is paying close attention to and making sense of what is being heard. It is the channel used most often for learning. Ironically, it is the least understood function of all. When thinking about listening, the tendency is to assume that listening is basically the same as hearing. This is a dangerous misconception because it leads many to believe that effective listening is instinctive. As a result, little effort is made to learn how to develop listening skills and unknowingly a vital communication function is neglected. Consequently, misunderstandings, confused instructions, loss of important information, and frustration are created.

2) **Exercises** There are exercises that can be performed to increase awareness of listening efficiency. A common exercise is for an individual who will be the listener to pick a person as the speaker and ask that person to do a listening check. The listener will listen to the speaker. The listening check involves summarizing what the listener thinks the speaker said. If the listener is unable to summarize, ask the speaker to help examine what is lowering listening efficiency. Another exercise is simply writing all the sounds heard in a certain time frame. Over a period of time, listening practice should help improve listening efficiency and two-way communication in the classroom.

   (a) **Instructor Barriers to Listening** As instructors, be aware of signals that give students the perception that you are not listening to them. These barriers interrupt the communication process as the model depicts below.

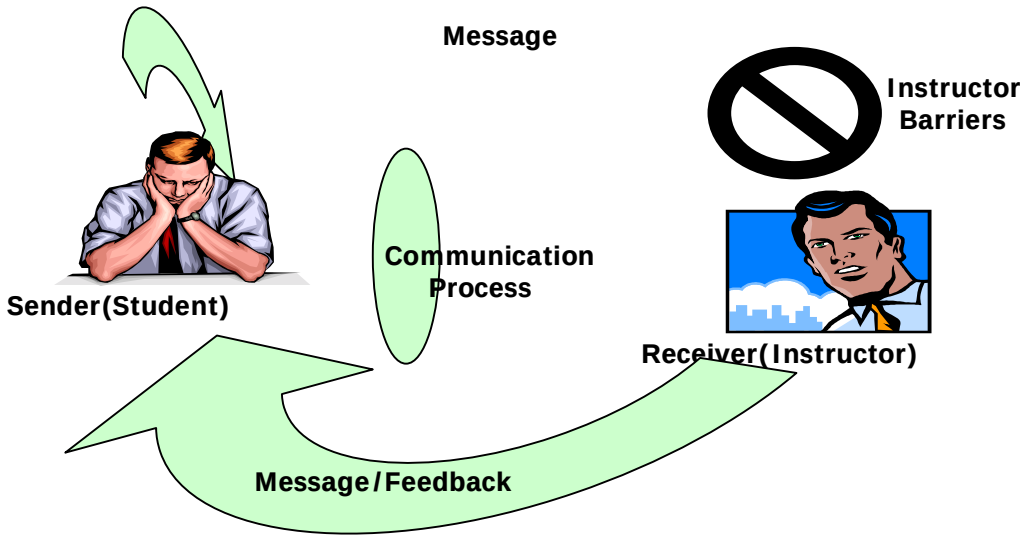


Figure 4-3 Instructor Barriers to Listening

- It is important for instructors to orient their body towards the speaker (student) and maintain eye contact when answering or receiving a question.

- Folded arms or hands on hips are examples of different types of body language or gestures that can indicate an instructor has a lack of interest in the speaker or may intimidate the speaker (student).

- Rolling eyes are some instructor facial expressions that may signal disapproval or disinterest.

- Instructor should not allow emotionally laden words to distract him/her during questions. Examples: a student uses the word sex vice gender or WM vice female Marine.

- Instructors should avoid using words or phrases that may have a negative effect on students when directed by instructors/fellow students such as: rock, idiot, stupid, lost one, wonder child, you fail to understand, you do this all the time, or are you confused again?

(b) **Student Barriers to Listening** An instructor must be aware of possibilities that cause student barriers to listening. Below are five causes to poor listening along with signs that will cue the instructor. This will assist tremendously with identifying these barriers and help minimize the interruption of the communication process.

(1) **Lack of Concentration** The brain is incredibly efficient. Although we talk at a rate of 120-150 words per minute, the brain can process 400-800 words a minute. This would seem to make listening very easy, but it actually has the opposite effect. Because the brain can take in a speaker's words and still have plenty of spare "brain time," there may be the temptation to give into physical or mental distractions. Concentrating is hard work.

- **Signs:** Lack of eye contact with instructor, tapping foot or pencil, fidgeting, doodling, clock-watching, inability to answer questions, a look of confusion, or lack of involvement in class discussions

(2) **Listening Too Hard** Listening too hard happens when a student tries to turn into a human sponge, soaking up a speaker's every word as if every word were equally important. Students try to remember all the names, all the dates, and all the places. In the process, students often miss the speaker's point by concentrating on too many details. Even worse, they may end up confusing the facts as well. It is impossible to remember everything a teacher says.

- **Signs**: Student is frantically trying to write down every word; seems frustrated, confused or overwhelmed.

- **Suggestions**: Tell the student to try highlighting the student outline, recording the class, and/or develop note-taking skills. The student should take notes in the form of a key-word outline. It is a rough outline that briefly notes a teachers main points and supporting evidence. Students who take effective notes usually receive higher grades than those who do not.

(3) **Jumping to Conclusions** This may also be referred to as "putting words into an instructor's mouth." It is one reason why communication is poor between those who are close. A person does not listen to what is being said due to thinking that he/she knows what is meant. Another way of jumping to conclusions is by prematurely deciding a topic is boring or misguided. The student may decide that an instructor has nothing valuable to say. For example, the topic could be on arguments to support women being in combat. If a student disagrees with the precept, the instructor may be tuned out. Nearly every class has something to offer - whether it is information, point of view, or technique.

- **Signs**: Interrupting other students, not enthusiastic, disruptive behavior or lack of concentration.

(4) **Focusing on Delivery and Personal Appearance** People tend to be judged by how they look or speak. Some people become so distracted by a speaker's accent, personal appearance, or vocal mannerisms that they lose sight of the message. Focusing on a speaker's delivery or personal appearance is one of the major barriers in the communication process, and it is something that always needs to be guarded against.

- **Signs**: Disrespectful to the instructor, know-it-all, distractive behavior.
- **Suggestions**: Apply speaking techniques discussed earlier, class management techniques, rehearse the lesson, and maintain high appearance standards.

d. **Questioning** By asking questions throughout the lesson instructors can emphasize a teaching point, monitor student comprehension, stimulate thinking, increase interest, and promote student participation. Instructors tend to ask questions in the "knowledge" category 80% to 90% of the time. These questions are not bad, but using them all the time is. Instructors should try to use higher order level of questions as defined by Dr. Bloom in Chapter 6. Questions that cause the learner to process, synthesize, and apply the knowledge presented during the instruction lead to better comprehension and application.

(1) **Characteristics of a Well Constructed Question**

- **Clear** - state questions in language familiar to the students and phrase the question so that the students understand its meaning.

- **Concise** - contains only one idea and is short enough for students to remember (not too wordy).
- **Relevant** - relates to the subject or material taught in the lesson.
- **Thought Provoking** - state so that the answer is not suggested in the question; open-ended (cannot be answered with a yes or no response); answer must not be displayed in the classroom (media); apply Bloom's Taxonomy (range of higher-level questions) as discussed in Chapter 6.

(2) **Asking students questions**

Step 1 - **ASK** the question (call students by name). Ensure the question is well constructed.

Step 2 - **PAUSE** to allow the student time to think. If the student cannot answer, rephrase the question or redirect the question to another student. For example: "Can someone help him/her out?" or "Sgt Smith, can you help him/her out?" Once the question has been answered move to the next step.

Step 3 - **ENSURE EVERYONE HEARD** the answer. For example, "Did everyone hear his/her answer?"

Step 4 - **PROVIDE FEEDBACK.** Inform the class whether or not the answer was correct. For example: "That's right" or "Good job." Avoid saying "wrong answer"; try to rephrase your response. For example: "That wasn't quite what I was looking for; can someone help him/her out?" or "Does everyone agree with that?" or "Does anyone have anything to add to that?" If no one can answer the question, provide the answer and clear up any confusion.

(3) **Receiving questions from students** The situation will dictate whether or not Steps 2 and 3 are necessary. Therefore, both steps are left up to the discretion of the instructor (optional).

Step 1 - **RECEIVE** the question. Ensure students raise their hands and solicit one student at a time (by name).

Step 2 - **REPHRASE**. If the question is unclear, rephrase it or have the student rephrase it. If the instructor rephrases the question, **verify** the student's question before moving to the next step. For example, "Let me make sure I understood your question. You wanted to know if we are off this weekend. Was that your question?" (OPTIONAL STEP)

Step 3 - **ENSURE THE QUESTION WAS HEARD**. State -"Did everyone hear SSgt Hall's question?" If you know the question was obviously loud enough for everyone to hear, then this step may be skipped. If it was not loud enough, then repeat it (paraphrase if needed) or have the student repeat it. (OPTIONAL STEP)

Step 4 - **ANSWER** the question. The instructor can either answer the question or redirect the question to the entire class to allow for student participation. For example, "That's a good question, can anyone answer it?" If it cannot be answered then provide the answer. If the instructor does not know the answer, let the student know that he/she will find out and get back with him/her at the break or after class.

Step 5 - **VERIFY**. Ask the student if the answer provided was adequate. For example: "Did that help you out?" "Did that clear up any confusion?" or "Did that answer your question?"

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3. Facilitation Techniques Transfer of learning refers to the extent to which students learned material/skills in the instructional setting that could be readily applied on the job. The instructor influences the transfer of learning through facilitation techniques. The way a lesson is presented will influence the success of the instruction. The instructor should strive to provide real world relevance, student focus, control the lesson, motivation techniques, and interaction with students. Below is a discussion of each.

a. **Real World Relevance** Whenever possible, maximize the similarity between the instruction and the job situation to show relevance. The instructor can also physically organize the instructional environment to create a realistic job setting for instruction.

b. **Students Focus** The most common attention getting techniques used by instructors are:

1) **Direct Attention** Essentially, it consists of directing students' attention to what was said or will be said through the use of verbal statements, gestures, or even a pause. For example: "Know this diagram well!" A combination is even more effective, but be careful not to overuse these techniques.

2) **Present Concepts from Simple to Complex** Discuss basic principles and ensure they are understood before introducing complicated details.

c. **Control the Lesson** Ensure the objectives of the class are met and that the discussion/questions do not go beyond the focus of the class. In addition, create a comfortable learning environment and use discretion/tact when correcting a student's inappropriate or disruptive behavior so that it is not detrimental to the learning environment.

d. **Motivation Techniques** For learning to be effective, students must be motivated to learn. There exists a shared responsibility for motivation between the instructor and the student. The learner controls the desire to learn, and the instructor controls the stimulation. Below is a list of what instructors can do to stimulate that motivation in students.

1) **Give Recognition** When students do something worthy of recognition, instructors need to give positive feedback to the student. Such recognition makes the student feel alive, important, and significant.

2) **Serve as a Good Role Model** An instructor has considerable influence on the student's motivation, thru the example given. Show them the proper way to complete a task, wear a uniform, or treat students to *PRACTICE WHAT YOU PREACH*. Research indicates that teachers with low self-concepts tend to have students in their classroom with lower self-concepts, and vice-versa.

3) **Stimulate Cooperation Among Students** Modern society places a lot of emphasis on competition. While competition with the self can lead to improved performance as students strive to do their best, competition against others can result in negative perceptions of the self especially if it isolates a person. With cooperation, everyone can experience the success of the group, and no one is viewed as the winner or loser.

4) **Consider Mastery Learning** Mastery is defined in terms of a specific set of major objectives that students are expected to exhibit by subject completion. Using this approach, a student's performance is measured against objectives rather than against the performance of other students. Students learn at different rates, therefore the instructor sets expectations for each individual. This allows time for learning to vary, so all or almost all students achieve the desired level of mastery.

5) **Have High but Reasonable Expectations for Students** There is a considerable amount of research that suggests that students perform up to the expectations that instructors have for them. Students grow, flourish, and develop better in a relationship with someone who projects an inherent trust and belief in their capacity to become what they have the potential to become.

6) **Recognize Potential in Students** Behavioral scientists have concluded that human's function at 10 percent or less of their potential. Negative self-concepts certainly stand in the way of releasing the potential of students.

7) **Providing Examples and Analogies** Providing a variety of examples and analogies when teaching concepts or skills will help solidify the key elements of the material and can further motivate students to learn.

8) **Recognizing Individual Differences** As discussed in Chapter 6 (Adult Learner), some students learn at a slower pace than others, and some students require different stimuli to become motivated to learn. The instructor must establish an effective student-instructor relationship. It is important that the instructor does not create barriers, but builds a rapport with the students, and shows empathy and genuine concern for their learning.

9) **Providing Feedback** Student performance improves when the instructor provides meaningful feedback on performance. Timely and constructive comments about student performance provide recognition of their efforts and help to correct errors. Used appropriately, feedback should specify clearly the action being reinforced and should be believable. Examples: "Good point!" "Outstanding," "Sgt Frost, that's a good idea! Let's discuss what might happen if you implemented that concept." Provide written comments on student assignments about the strengths and weaknesses of the student's ideas/concepts. But be cautious with praise for if it is used too often, or inappropriately, it can have a negative effect on the motivation of adult learners.

e. **Interaction with Students** Learning is an active process for adult learners. The instructor should strive to involve students in the instruction process. To do so, the instructor should be aware of students' prior knowledge, the context in which the material is presented, how learning will be applied to the job, and the realization that student understanding of new information depends on how well it relates to their prior knowledge. Probe throughout the lesson to increase interaction. Have students answer each other's questions whenever possible, and allow the adult learner every opportunity to take responsibility for his or her own learning.

4402. STEPS IN CONDUCTING THE LESSON

1. Present the Introduction The instructor provides the students with a brief preview of the class by explaining the purpose of the class, reviewing the learning objectives with the students, how the lesson will be taught (including mentioning the administrative instructions), and how and when students will be evaluated.

a. The first element (Gain Attention and WIIFM) must always be mentioned first, and the remaining elements should be mentioned as a structured event using the acronym **GOLMEST** (Gain Attention, Overview, Learning Objectives, Method/Media, Evaluation, Safety, and Transitions). By employing this sequence, your students will become familiar with the important elements of the introduction and this will help reduce the number of student questions that always seem to pop up about the introduction.

WIIFM – What Is In It For Me? Why do I need to listen to this class?

GOLMEST - (Gain Attention, Overview, Learning Objectives, Method/Media, Evaluation, Safety, and Transitions).

b. The introduction must be completed prior to transitioning into the body of the lesson.

2. Present the Body After presenting the introduction, present the body of the lesson. The body will be presented in the same sequence as the learning objectives in order for the lesson to "flow smoothly."

a. Transitions tie together the main ideas in the lesson, smoothly summarizing one main idea and introducing the next one. They essentially form "bridges" that reinforce the conceptual framework, enabling the instructor to probe for understanding and gather feedback from students before opening the next main idea.

"RECALL" – This is memorization of the subject without displaying comprehension.

b. The term "probing" simply means asking follow-up questions to students. Probes can ask for specifics, clarifications, consequences, elaborations, parallel examples, relationships to other issues, or explanations. Probes are important because they help students explore and express what they know, even when they aren't sure they know it. You should probe throughout the lesson to assess students' comprehension of the material. You can probe at any time, but the questions must be thought provoking and should not be simple "recall" questions as discussed in Section 4301 (Effective Communication).

3. Present the Summary Once finished with the last main idea, transition into the summary. In the summary, the instructor must mention all main ideas that were covered in the lesson. In addition, provide closure that explains why the student just sat through the lesson. Then provide closing instructions to alleviate any concerns the student may have (i.e., fill out IRFs and take a ten-minute break).

4403. METHOD EMPLOYMENT

The definition of instructional methods is "an educational approach for turning knowledge into learning." Instructional methods are the "how to" in the delivery of training. The methods used in any learning situation are primarily dictated by the learning objectives decided upon by the course developers. In many cases, a combination of methods is used to intensify the learning experiences. All instructors need to understand the following methods and their responsibilities in using them: lecture, indirect discourse, demonstration, reading, self-paced, questioning, discussion non-directed, guided discussion, practical application, field trips, simulations, case study, and coaching. The lecture method and the demonstration method are the two most commonly used in Marine Corps training. However, for purposes of this chapter, the methods are discussed as sequenced above.

1. Lecture (Formal, Informal, Briefing, Guest) The lecture method is an instructional presentation of information, concepts, or principles. Its main purpose is to present a large amount of information in a short period of time. The lecture method is an efficient way to introduce a new topic of study or present background material students need for future classes.

a. A ***formal*** lecture allows instructors to present a subject to a large audience because they use no media and there is no interaction between the students and the instructor. The lecture method depends primarily on student listening and note-taking skills for the transfer of learning. The instructor must have effective speaking skills, an in-depth knowledge of the subject matter, and find realistic examples and analogies to use with explanations. In preparing to deliver a lecture, the instructor must set clear-cut goals and objectives. The instructor should remember that the only feedback received from the audience will be nonverbal communications. Since the audience may lose interest with no active part in the instruction, the lecture should last no more than 30 minutes. Lectures should be short, well organized, and to the point.

b. In the ***informal*** lecture, the size of the group is usually smaller than the formal lecture and student participation develops when the instructor questions the students or they question the instructor on points presented. Considerable verbal interaction between instructor and student is often possible in the form of both questions and discussion. The delivery style is even more conversational, with students often addressed directly by name. An *informal* lecture with media is commonly used in the Marine Corps for presenting information, concepts, and principles. Most learning takes place through the sense of sight. It follows then that all students must be able to see the media being used, which will limit class size. The media used can reduce the amount of explanation time required for students to grasp concepts, structures, and relationships. Instructors simply cannot get some ideas across to students without the use of media. For example, think how difficult an explanation of the operation of the internal combustion engine would be without the use of media.

When using **informal lecture** with media, the instructor must prepare properly. That includes practicing with the actual media in the places they will be used. Instructors should plan the timing of the use of media to keep the students' attention and to stress important points. Since the instructor's explanation of the media will require the use of effective instructor techniques, he/she needs to decide which ones to use. Mentally rehearse those techniques and practice using the media until the lecture can be presented smoothly.

c. A ***briefing*** is a formal or informal presentation in which a variety of significant facts are presented as concisely as possible. The briefing is rarely concerned with material beyond the knowledge level and is almost always accompanied by media in various forms. Strictly speaking, the briefing is not a teaching method, but it is sometimes used in school situations.

d. A ***guest lecture*** is a presentation by a person other than the instructor who is usually an expert. It is used to give variety to the class period or to supply information in an area where the instructor is not an expert.

2. Indirect Discourse (Panel discussion, Dialogue, Teaching Interview) These presentational methods provide situations in which the skill or material to be learned is in some way presented to or demonstrated for the learner. In some presentational methods there is little if any activity or interaction required of students other than their attention and desire to learn. When a question-and-answer period follows the interview, students can interact with the expert.

a. A ***dialogue*** is an interaction between two or more persons, one of whom may be the instructor. It is generally used to present sharply opposing points of view for students. The dialogue is often highly structured towards preplanned goals and may take the form of questions and answers between the participants.

b. A ***panel*** is a structured or unstructured discussion between two or more experts (generally excluding the regular instructor) presented in a variety of ways, such as constructive arguments followed by debate, response to questions from the instructor or the students, a preplanned agenda, a fixed or a random order of speakers, or free discussion.

c. A ***teaching interview*** is when the instructor questions a visiting expert and follows a highly structured plan, which leads to educational objectives. The advantage of the teaching interview over the guest lecture is that the instructor controls the expert's presentation. The expert normally requires little or no advance preparation, but responds on the spur of the moment from general experience.

3. Demonstration The basic, and most often used, method of instruction for teaching skill-type subjects is the demonstration method. It covers all of the steps the students need to learn a skill in an effective learning sequence. Though it primarily appeals to auditory and visual learners, it is also extremely effective when used in conjunction with lecture and prior to practical application. This method always includes a demonstration step and a performance step and allows other steps as needed. Use the following techniques when giving an actual demonstration:

a. **Position the students and media properly** Direct the students to gather around a worktable or media and make sure every student has an unobstructed view. Make sure that all students will be able to see and hear the demonstration. This should be accomplished right before the lesson; someone else may have used the classroom and rearranged the setting. A demonstration will not be effective if someone cannot see it.

b. **Show and explain the operations** Perform the operations in step-by-step order. Whenever possible, present the telling and doing simultaneously. Do not hurry; instructor will not normally emphasize speed in performing operations or in moving from one operation to another in the demonstration step. Make certain the students understand the first step before proceeding to the second, and so on. Repeat difficult operations. Pause briefly after each operation to observe student reaction and to check student comprehension.

c. **Observe safety precautions** Rigging a safety line, donning a safety mask, or tagging an electric cable may take a few more seconds, but time is not wasted. Instead, the instructor has impressed the students with the importance of exercising extreme care in dealing with potentially dangerous equipment.

d. **Give proper attention to terminology** Call each part of the media used by its proper name each time attention is called to it. Getting students to retain the correct nomenclature requires more than just mentioning the name. The following suggestions should prove helpful:

1) **List the names of parts.**
2) **Refer students to any available chart that shows the parts and names of parts.**
3) **Conduct a terminology drill on the parts of the actual item/object while it is being assembled or disassembled, as appropriate.**

e. **Check student comprehension carefully** Ask questions during the demonstration step that require the students to recall nomenclature, procedural steps, underlying principles, safety precautions, and the like. Watch the class for reactions indicating lack of attention, confusion, or doubt. Do not depend solely upon visual observations.

f. **Obtain necessary assistance** When teaching skills, such as donning a field protective mask, in which a distinction between right and left is important; ask an assistant instructor. Ask the assistant to stand so that the class may see what he or she is doing. Then direct the assistant in performing the activity while observing the reaction of the students.

g. **Check equipment and tools** The most important items to check are the equipment and tools that will be used to conduct the demonstration. Ensure all equipment is functioning properly.

h. **Rehearse** When the instructor rehearses, he or she needs to perform the actual demonstration. Rehearsing in the mind is not the same as rehearsing by doing. Rehearsal by doing will reveal possible problems. If an assistant is being used, practice with that person as discussed in Section 4200 (Prepare for Instruction).

i. **Start simple** Remember the law of primacy when performing the demonstration step. Always proceed from simple to complex in logical sequence; show the correct way to perform the steps the first time you demonstrate them. Along with teaching a skill, develop proper attitudes, such as the desire to perform safely, and the desire to exercise economy of time and effort.

4. Reading (Books, Periodicals, Microfilms, Manuals, Handouts)

a. Reading assignments for students may include the following printed materials: books, periodicals, microfilms, manuals and regulations, and handouts. This is very effective and time efficient method of presenting materials since students can progress at their own pace.

b. However, since individuals read at different speeds, keeping the entire class on schedule can be a challenge. Individual reading is also dependent on the availability of resources. Reading is geared for individual instruction and the instructor must be very knowledgeable with the material.

5. Self-Paced (Programmed, Modular, Computer Assisted, Mediated)

a. ***Programmed instruction*** is a method of instruction, which usually includes a carefully planned sequence of small units of instruction that require the learner to respond to cues and receive immediate feedback. Various media (books, teaching machines, and computers) are used to deliver the programmed instruction to the learner.

b. ***Modular instruction*** are prepackaged units of instruction which typically contain a clear statement of objectives and all necessary learning resources to permit the learner to achieve these objectives. A module can be a complete unit or part of a course.

c. ***Computer-assisted instruction*** is a learning experience that uses a computer as the vehicle for interaction between the learner and the planned course of instruction.

d. ***Mediated instruction*** includes such devices as slides, films, tapes, and cassettes used to present the planned course of instruction to the learner.

6. Questioning (Socratic Method, Student Query)

For those instructors who want to emphasize a point and stimulate student thinking, this method is very effective. It not only keeps the student focused, but it also checks understanding and seeks clarification in the students. Two examples of this method are *Socratic Method* and *Student Query*. Both require a high level of instructor expertise.

a. ***Socratic Method*** While rarely seen in its pure form, instruction by asking students questions is a method as old as ancient Greece and as modern as a great books course. The method may resemble a guided discussion, but the goal is often to obtain specific answers to specific questions (reiteration) and not to stimulate discussion. An instructor may use the method for "trapping" students into inconsistencies in logic, which sharpen their thinking skills. Law professors often use the method for "interrogating" specific students using a series of questions as they might be used in a court of law.

b. ***Student Query***. "Students asking questions" is often used in combination with other methods such as the lecture, the panel discussion, or the teaching interview, but it can be used by itself, either on a one-to-one basis in tutoring or coaching or as part of small or large groups. The method is student controlled, although a skilled responder can also control the session to a certain extent. Students' questions may often be a measure of the degree of their understanding of a particular subject. That is, they "know enough to ask the right questions."

7. Discussion-Non Directed (Peer Teaching, Small Group, Free Discussion) In its original form, the peer-controlled seminar is a group of highly qualified peers (such as a doctoral-level faculty) who meet periodically for the exchange of ideas, usually in the form of prepared papers with discussion or questions following. The research seminar resembles a peer-controlled seminar when the instructor allows qualified students to lead the discussion with the instructor providing proper supervision. In Professional Military Education (PME), a peer often acts as a "facilitator" to lead discussions or conduct workshops. When used, the instructor should provide a statement of the educational objectives, a suggested discussion guide, and should require some tangible evidence of the results of the discussion.

8. Guided Discussion The guided discussion is an activity in which people talk together to share information about a topic or problem or to seek possible available evidence on a solution. When using discussion, make sure the seating arrangement allows all participants to have eye contact with each other. This limits class size.

a. This method involves an interchange of ideas by the students while the instructors provide guidance. Used alone or in combination with other methods, it stimulates every student to think constructively. It also encourages students to share their personal experiences and knowledge with their classmates and to contribute ideas as a means of solving problems.

b. Initiating discussion and channeling students' thinking and responses along predetermined lines is called "directed discussion." This method is useful in teaching skills such as problem solving and understanding cause-and-effect relationships.

c. Directed discussion is often used in training that is conducted for the purpose of developing favorable attitudes toward a subject or situation. When that is your purpose, directed discussion gives students more freedom to express their opinions. The success of directed discussion depends to a large extent on instructor leadership.

d. As in previous methods discussed, the success of a discussion depends on careful planning. Remember that some elements of the discussion method are included in every other method of instruction except for a straight lecture. The goal in using the discussion method is to actively involve your students in the learning process. The old Chinese proverb, "I hear and I forget, I see and I remember, I do and I understand," certainly applies in the training arena. Strive for maximum student involvement.

9. Practical Application This is a method of practice used to reinforce a skill or a task as it relates to the work place. ***This method is not an examination***. The student should be supervised and then provided feedback to determine if more practice is needed. This method generally follows an instructor demonstration and the student replicates the instructor demonstration alone or in groups.

a. **Individual/Group Projects**

1) **Determine Size** Determine whether or not the exercise will be accomplished on an individual basis or in groups.

2) **Adequate Space** If the lesson will be conducted in a classroom, make sure there is adequate room for the students to perform any necessary skills. If it is outside, ensure the area is clear and safe.

3) **Double-Check** Double-check the materials, equipment, and tools the students will be using when conducting the practical exercise. Ensure all the material is current and available. Also, ensure the equipment is functioning properly.

b. **Supervise, Observe, Help** The job of the instructor is to supervise, observe and provide help. The instructor or assistant instructors should supervise to facilitate learning, watching the students and correcting any mistakes made during the exercise. It is a good idea to talk to your assistant instructors to determine if they have observed anything additional.

10. Field Trips Field trips are extensions of classroom instruction and provide worthwhile learning opportunities for students to participate in unique and enriching educational experiences. Instructors should develop systematic procedures for ensuring that all trips provide optimal learning opportunities for students. The following minimal procedures should be used when conducting field trips:

a. Identify any special requirements for participation on the trip--special skills, fitness, certification--as well as any hazards or dangers on the trip or at the site that might affect the health and safety of the students.

b. Obtain approval where appropriate.

c. Ask students to advise you of any special disabilities, problems or needs that may need to be accommodated.

d. Consider the need for special clothing or equipment needed in case of weather or other conditions.

e. Determine transportation needs--reservation of vehicles, drivers, need for site supervision.

f. Plan for emergencies--theft, illness, vehicle emergency, weather delays, student misconduct or threats to the safety of others.

g. Communicate information to students in advance about schedules, departure locations, route, rest and meal stops, lodging, emergency procedures, protocol for problems, and rules of conduct.

h. Familiarize students with the site and their surroundings.

i. Identify learning objectives for the field trip to assist the students' learning

11. Simulations (Role-playing, Games) Many Marines in supervisory or administrative billets require proficiency in two separate and distinct skill sets. The first skill set is MOS related, while the second deals with leadership and interpersonal skills. Simulations are a preferred method for building proficiency in these two areas.

a. Role-playing requires the students to assume active roles in a low risk simulated situation that involves effective, realistic behaviors. It may involve individuals, groups or whole units. The role-play is followed by a group discussion that gives students a chance to re-examine their behavior. It is particularly useful in teaching the development of interpersonal skills (e.g., leadership or counseling skills). The new skill is normally taught through lecture and then practiced within the role-play. For example, one student could play the role of an instructor and the other one could play the role of the student. However, it is also used in MOS training, such as firefighting, flight training, and M1A1 training. In these examples training simulators are used to create "real life" situations while controlling risk to personnel and equipment.

b. Successful role-playing provides a chance for every student to take part in the lesson. It provides vivid experiences both for the participants and for the observers. Simulation mainly prepares or refreshes both MOS and interpersonal skills. However, it does not eliminate the need for Marines to learn through application on-the-job. Prior to selecting the type of role-play to be used the instructor must consider how many students are involved and how to deal with difficult students (overly defensive, or non-participating). The instructor must check the master lesson file for a detailed orientation package that describes the student's role in the overall scenario and any supporting information.

1) **Types of Role-Play**

a) **Single** The simplest role-play involves two people who are asked to re-enact a problem either from a description or one that came up in a previous discussion. The advantage here is the whole group is able to see and then discuss the same problem. The disadvantage is that the chosen players may feel self-conscious about being the focus of attention and only those two players get to practice the behaviors. It is recommended that the instructor ask for volunteers for the role-play.

b) **Double** Each player has an alter ego who stands behind the player adding comments or questions during the role-play that perhaps the primary person may be thinking but not saying. The second player can be assigned to the role or participants can spontaneously get into the action when they think of an additional response. They can also help out the primary player with a new idea or get that player back to reality. The facilitator should demonstrate this type of role-play before getting others to try it.

c) **Reverse** During the role-play, the facilitator asks the two students to switch roles and seats.

d) **Rotation** During the role-play, the facilitator asks new participants to continue the role-play.

e) **Multiple** Small groups are formed and they simultaneously enact the role-play. Processing may be more difficult.

2) **Employment** The instructor must ensure that all students understand related material and the objective of the role-play. The instructor must state the behavioral objectives, step-by-step instructions, any rules, and tell the students that the role-play is not a pass/fail exercise.

a) **Pass out Role Play Information** Hand out all background information and allow the students enough time to read it carefully and provide clarification as needed.

b) **Demonstrate** Conduct a demonstration of a role-play prior to its first time being used in course.

c) **Assign and Define Roles** Verbally designate roles or distribute printed descriptions of the roles and observers handout. Think about how to handle students who have been part of a similar situation, get overly defensive, or do not want to participate.

d) **Monitor** Create a comfortable environment to encourage active participation.

e) **Focus**. Ensure participants focus on the process of practicing interpersonal skills rather than the content of the situation.

3) **Supervise, Observe, Provide Guidance** The job of the instructor is to supervise, observe, and provide guidance to the students. The instructor or assistant instructors should facilitate learning by refocusing the group and correcting any mistakes students make during the exercise. It is a good idea to talk to any assistant instructors to determine if they have observed anything additional.

12. Case Study Case studies are normally developed from actual events that have occurred in the operating forces or supporting establishment. Case study focuses predominantly on analyzing and understanding the process of making decisions and making sense of complex or ambiguous information. Case studies are an excellent method for bringing together multiple learning points under a culminating exercise that causes students to process, analyze, and synthesize information. The instructor will normally present a case study in printed form, but it may also be presented using pictures, films, role-playing, or oral presentations. After the case study is presented, the class can be divided into groups. The students then analyze, discuss, and report the key elements of the case and the lessons to be learned.

a. **Objective** The main objective of a case study is for students to gain practical knowledge from an actual event and to develop analytical and problem-solving skills. The greatest value of the case study is that it challenges students to apply what they know and comprehend to a realistic situation. Normally in the case study, concepts and principles are not taught directly. Instead, they emerge gradually as students are forced to formulate theories to support their case decisions. In preparation, the instructor should do the following:

1) **Distribute Copies of the Case**

2) **Make the Following Suggestions**

a) **Skim** Read the first few paragraphs of the case, and then skim the rest to find out in general what the case is about and what kind of information is included for analysis.

b) **Facts as you go** Put yourself in the position of the main character in the case and ask yourself what the basic issue/problem is, how the issues/problems are affected by the information presented in the case, and how those issues/problems should be handled.

c) **Take Notes** Note the basic issues on a sheet of paper. Then read through the case again, jotting down the relevant considerations for each problem.

3) **Develop Solutions** Instruct the students to develop possible solutions to the case issues as they are reading. Solutions must be supported by evidence found in the case.

4) **Instruct the Students to Begin Reading** Allow ample time for careful reading of the case.

5) **Re-Read** Go back and carefully read the entire case, underlining key to the case.

6) **Opening Question** Some case leaders begin with the question, "What is the issue here?" Then go on to, "What are the pertinent facts?" Others begin with a more general question, "What action should be taken?" The approach depends on the intellectual maturity of the students and the subject matter.

7) **Refrain from Lecturing** The case study method is inherently a student-centered approach. Keep instructor comments to a minimum and let the students do the talking.

8) **Be Non-Directive** In most case studies, there is no single correct answer. It is more important to lead the students toward the application of sound principles than to persist in an endless search for a single correct answer. The instructor should focus on facilitation and must avoid imposing personal views and passing judgment on student contributions. The instructor's role is to encourage independent thinking and the achievement of the lesson objective.

9) **Summarize** The key learning points (should be no more than 3-4) and they must tie back to the learning objective**.**

b. **Controlling Participation** The case discussion is controlled much like the guided discussion, except that in this case, the instructor may feel free to enter the discussion. However, he/she needs to remain neutral. The instructor can keep track of the discussion on the chalkboard, turn chart, dry erase board, etc., so that the entire class has a visual record of where the discussion has been and where it is going.

13. Coaching This method is an intensive learning experience for individuals or small groups. It is characterized by significant student involvement and immediate instructor feedback. A videotape of student performance is an excellent teaching aid when supplemented by an instructor's analysis and critique. This technique is particularly effective in instructor training.

a. **Preparation** This is the key to coaching. The first thing the instructor must do is to identify the student's current strengths, weaknesses, and overall level of competence. After identifying these key elements, the instructor/coach takes the following steps:

1) **Identify Needs** List specific knowledge, skills, or attitudes to be addressed with the application.

2) **Determine Desired Goal** The goals should address the identified needs.

3) **Select Activities** List resources, strategies, and initiatives needed for development.

4) **Determine Target Dates**

b. **Employment**

1) **Define Roles** Discuss your role, goals, and target dates with the student and reach an agreement.

2) **Probe** Determine what the student already knows and build on that knowledge throughout a step-by-step process. Use thought-provoking questions (Effective Communication) and have the student explain performance. Demonstration prior to the exercise is highly recommended.

3) **Problem Solving** Teach the students to search for alternatives and solve problems on their own. Strive to make them self-sufficient (minimal guidance needed). This will increase their confidence and ensure they do not immediately request assistance. Provide suggestions if needed.

4) **Intervention** Know when to intervene, when to stand back from situations, and let the learner figure out a solution. Become involved in risky situations that demand your intervention, but avoid unnecessary involvement that will detract from your learners' training and achievement.

5) **Feedback** It is extremely important to tell the student what they are doing throughout the exercise so they can get a sense of achievement.

6) **Supervise, Observe** The job of the instructor is to supervise and observe. The instructor or assistant instructors should supervise to facilitate learning, watching the students, and correcting any mistakes made during the exercise. Observe the exercise for any discrepancies.

7) **Collect and Analyze Performance Data**

8) **As Needed Review and Modify Goals or Training**.

9) **Evaluate Performance**

4500. ADMINISTER TESTS

SECTION 5

The primary purpose for administering tests is to determine if the learning objectives have been met, improve instruction, and thereby increase student learning. This is accomplished by having a well thought out evaluation process. The following is a basic process to be used by formal schools/detachments. However, some schools may need to modify this process because of the unique nature of their instruction and/or resource constraints.

4501. TYPES OF TESTS

A student's knowledge and skill level can be tested at different intervals before, during, and after the course of instruction. This is accomplished by a pre-test, progress test, and post-test.

1. Pre-Test A pre-test is administered to students prior to entry into a course or unit of instruction to determine the knowledge, skills, and behaviors the students already possess in a given subject. A pre-test is useful for tailoring instruction to match the entering student's knowledge and skill level. Example: A pre-test may reveal that incoming students have in-depth knowledge of M16A2 rifle loading and unloading procedures. With this information, an instructor can teach loading and unloading procedures as a refresher only.

2. Progress Test A progress test is administered throughout a course to evaluate student progress and to determine the degree to which students are accomplishing the learning objectives.

3. Post-Test A post-test reveals the effectiveness of instruction and how well the student learned by determining whether or not the learning objectives were achieved. Test items are designed to duplicate the behavior expressed in the learning objectives so that this determination can be made.

4502. METHODS OF TESTING

1. Performance-Based Testing A performance test duplicates the job behavior(s) by using the same equipment, resources, setting, or circumstances that the student will encounter on the job. The Marine Corps strives for performance-based instruction and testing to increase the transfer of learning from the instructional environment to the job. Normally, a performance checklist is used to record the student's level of mastery on the test. The test must have specific instructions for both the instructor and the student.

2. Knowledge-Based Testing Knowledge-based test can be oral or written. This method of testing does not evaluate the student's ability to perform the required job skills; however, it does determine if the student knows how to perform the required job skills. The advantages of knowledge-based tests are high degree of objectivity in scoring and the capability of measuring a large numbers of facts, ideas, or principles in a relatively short time. The most frequently used knowledge tests are:

a. Multiple-choice
b. Matching
c. True-false
d. Essay
e. Short answer
f. Completion (fill-in-the-blank)

There are other knowledge-based tests known as authentic assessments. These include:

a. Take–home tests This type of test allows students to take the test at home with the use of references and resources.

b. Open-book tests This type of test can reduce stress, but may decrease the student's motivation to study.

c. Paired testing This type of test allows students to work in pairs on single essay exams. Pairs can be self-selected or assigned.

d. Portfolios This may not be a specific test but merely a collection of student's work. A student's portfolio may include, sample papers (first drafts and revisions), journal entries, essay exams, and other work representative of the student's progress. Portfolios may be given a letter grade or master/non-master.

4501. STEPS IN ADMINISTERING STUDENT TESTS

1. Gather Test Materials When gathering test materials, an instructor needs to know the materials required, the type of test to be given, and have access to the materials.

STEP 1

a. **The materials needed to administer a test will depend on the type of test to be given.**

b. **If the test is knowledge-based, the instructor needs enough copies of the test, test booklets, and answer sheets for each student. The instructor should also ensure the students have a writing instrument (pen/pencil) to answer the questions.**

c. **Extra answer sheets and pencils or materials that may be needed should be available.**

d. **If the test is performance-based, such as disassemble/assemble an M16A2, the instructor will need at least one M16A2 and performance checklists for the students to demonstrate the ability to disassemble/assemble the M16A2.**

When gathering test materials, here are some simple questions an instructor should ask prior to a test; the who, what, where, when, and how questions:

e. **Who** will be administering the test?

f. **What** type of test is being administered?

g. **Where** are test materials located and does liaison need to be made to access materials?

h. **Where** is the test being administered?

i. **When** is the test being administered?

j. **How** is the test being administered?

STEP 2

2. Prepare the Environment When preparing the environment, the selection of a place to administer a test is very important for reliable evaluation results. Some of the key elements that need to be considered are as follows:

a. **Arrange for tests to be administered in the morning when students are fresh and alert. Students have a higher probability of not doing as well in the afternoon due to fatigue. Note: This does not apply if the conditions of the test require fatigue or a specific time of day. Example: Conduct a *night* attack.**

b. **Ensure the environment is prepared and conducive to the testing. The environment should be quiet, well ventilated, have adequate lighting, and provide the student with ample working space.**

c. **Arrive at the testing room well in advance of the class to ensure all testing materials have been gathered, are assembled, and ready when administrating the test to the students. Some instructors prefer to have the tests and other materials in place prior to the students arriving.**

d. **Post a sign or a placard outside each doorway to inform that a test is being conducted.**

e. **Instructors should follow their local Standing Operating Procedures (SOP) for handling visits by distinguished guests.**

f. **Ensure that logistical and safety requirements are met.**

STEP 3

3. Clarify Directions When administering a test, provide clear and concise instructions/directions to avoid confusion. When students understand exactly what they are supposed to do, they are less likely to become nervous or tense. Therefore, their test scores will represent a more accurate picture of their achievement. Although carefully written instructions/directions for taking the test should be a part of the evaluation, oral directions should be given as well. When providing instructions/directions to the students, there are some key elements that need to be kept in mind. A complete set of instructions provided in written form, orally, and/or by media should specify at a minimum the following:

a. **The test instructions.** These should be kept uniform from class to class.

b. **How the test will be collected.** After conducting the test, the evaluator must collect all test materials in a predetermined order.

c. **The time allowed for each part of the test.**

d. **Beginning and ending test times.** If the test has time limits, these need to be announced and observed. Example: Beginning and ending times written on the chalk or dry erase board**.**

e. **How students will proceed when taking the test.** Students should be directed on whether to proceed individually, from part to part, from page to page, whether to wait for a signal or further instructions.

f. **The number of test items on the test and how the student is to respond.** It is often a good plan to provide a sample test item with the correct response.

g. **What references or tools may be used during the test.**

h. **Inform the students the procedure(s) to follow when they have completed the test.** Are they free to turn in their papers and leave the room or are they to remain seated until all materials are collected?

i. **Inform students to keep their eyes on their own paper.**

4. Provide An Opportunity For Questions After providing the students with instructions/directions and prior to the students taking the test, the evaluator needs to invite the students to ask questions concerning procedures and make it clear whether questions may or may not be asked of the instructor after the test begins. If any questions arise from the student(s), be verbally clear on the instructions/directions and check back with the student(s) to see if they understand the directions mentioned.

STEP 4

5. Conduct the Test After the test materials have been gathered, the environment prepared, the instructions/directions given, and an opportunity for questions has been provided, the evaluator is ready to conduct the test. Some elements that the evaluator should apply, as well as keep in mind when conducting a test, are as follows:

STEP 5

a. **Start and stop the test on time if a time has been given.**

b. **Monitor the test throughout the testing period by frequently walking about the classroom.**

c. **Keep distractions to a minimum.**

d. **Collect the tests in a pre-determined order.**

e. **Before conducting a review with the students, the instructor should pass out Examination Rating Forms (ERFs) to cover at least 10% of the students that took the test. This is to gather data on the students' impression of the test and its overall process.**

The review should cover the correct performance that was expected of the student. This review should always be conducted before the students receive their results.

f. **Conduct a review of the test with the students. The review should cover the correct performance that was expected of the student. This review should always be conducted before the students receive their results. Students will always try to debate or justify their answers once they learn their grade. This type of exchange will hinder the review process and could create student/instructor barriers that will be difficult to overcome. In the event a student does want to debate their answers, inform them to wait until they receive their results, as that is the appropriate time for recourse.**

6. Scoring and Grading A test may be valid, reliable, and comprehensive, but if not scored and graded properly individual scores and grades are useless.

STEP 6

a. **Knowledge-Based Tests** When scoring and grading knowledge tests, an answer key along with a grading key must be obtained to maintain standard results for each test being scored and graded. Scoring is nothing more than marking the correct answers on a copy of the test answer sheet and then utilizing it to score the students' test answer sheets. Grading is done after the test has been scored by assigning numerical values in accordance with the grading key.

Example:

When using a bubble sheet test, involving a, b, c, d, or e, it is possible to take a copy of that evaluation and punch out the desired answers, then utilize it as a key to score the test answer sheets.

b. **Performance-Based Tests** When scoring and grading a performance test, a performance checklist is usually made. This checklist must be configured to a skill level, which shows whether the student has accomplished the desired skill. Some performance checklists may only involve a master or non-master qualification. In this case, if multiple instructors are involved in the scoring and grading process, all instructors must use the same scoring and grading procedure.

Example:

If one instructor assigns a "Poor" score and another instructor assigns a "Good" score to the same paper, the grades may express instructors' bias and not student proficiency.

SECTION 6

4600. AFTER-LESSON MANAGEMENT

The primary purpose for employing after-lesson management is to ensure the effective and efficient use of school resources. By ensuring the instructional environment is well maintained, the instructor is saving the school valuable resources. The secondary purpose is to capture specific lesson related data for future use in the schools evaluation program.

After-lesson management actions are all the activities that must be performed after the lesson has been conducted. These activities include:

1. Removal of media from the instructional environment.

2. Securing all classified material.

3. Leaving the instructional environment as it was found.

4. Conducting a cleanup of outdoor facilities.

5. Turning in any equipment and resources temporarily borrowed for the lesson.

6. Reviewing the school SOP. There may be additional after lesson management actions or requirements (e.g., march the students to chow).

7. Complete the After Instruction Report (AIR).

4601. COMPLETING AN AFTER-INSTRUCTION REPORT

After conducting a lesson, it is an instructor's responsibility to assess the effectiveness of instruction. The primary means of recording this assessment is the After-Instruction Report (AIR). Included in the AIR is the compilation of IRF data, instructor's analysis, and recommendations for improvement. The AIR is a single document that summarizes one iteration of a lesson. To have an effective AIR, the following must be completed: collect data, analyze data, record data, make recommendations, and submit the completed AIR. See APPENDIX F for a sample AIR.

STEP 1

1. Collect Data This is predominantly done through two sources:

a. **Students** By providing Instructional Rating Forms (IRFs) to students and allowing them the opportunity to respond to the lessons, formal schools/detachments are provided data to make future revisions, if necessary. Data feedback that comes from the students may include, but is not limited to, problems with a lesson, instructors, or other materials associated with instruction. IRFs should be completed for each lesson. The frequency and number of rating forms used will depend upon the school's Standing Operating Procedures (SOP). At a minimum, survey ten percent of the students. When a lesson is being given for the first time, it is recommended that all students complete an IRF. More information on the IRF can be found in Chapter 5, Section 5205. See APPENDIX D for a sample IRF.

b. **Instructors** Instructors are a valuable source of data. They can report problems with any part of the instruction. This could include, but is not limited to, the instructor's observation of student difficulties with certain learning objectives, the amount of time spent in presenting a lesson, the instructional environment, and opinions about instructional materials. Instructors can make any recommendations associated with the lesson, and the course as a whole. All instructor comments are recorded on the AIR.

STEP 2

2. Analyze Data Before data can be analyzed, the instructor should organize data into topics areas. For example, an instructor could organize using the four broad categories listed below:

a. Problems with the course material.

b. Problems with student performance.

c. Problems with instructor performance.

d. Problems with the instructional environment.

Instructors should review their notes and comments for each of the topic areas that were identified. Then, look for any trends in the data and draw tentative conclusions concerning effectiveness or efficiency of the lesson. The process of identifying trends involves the instructor looking for data that occurs more than once. A single, provocative comment would not be considered a trend. For example, a trend might be recorded of students missing a particular question or several of the same comments from IRFs. From these trends, identify problem areas and make recommendations for change. Problem areas can also be identified from singular comments on an IRF. For example, if a student pointed out that the outline quoted a Marine Corps Order that was superceded, this would be an immediate problem area, with no need to establish a trend of similar comments.

3. Begin Recording Data Once all data has been collected and analyzed, record the data on the AIR. Listed below are the procedure for recording data:

a. **Instructional Rating Form (IRF) Data** After the block of instruction, the instructor should collect all IRFs and compile all the data. Record the compiled data on the appropriate block of the AIR. This is done right after instruction because the instructor still has a fresh memory of what took place during instruction and can analyze the feedback given from the students. After analyzing the data, the instructor as well can make comments and recommendations related to areas of concern dealing with students, instruction, and the feedback given back from the students.

b. **Time-Critical Operational Risk Assessments** If new safety requirements are identified during the lesson, the instructor should record the ORM lessons learned, additional controls used, and/or occurrences in the Instructor Comments area labeled "Reassessment of ORA." By allowing the Risk Assessment to be included in the AIR, other instructors will benefit in the future.

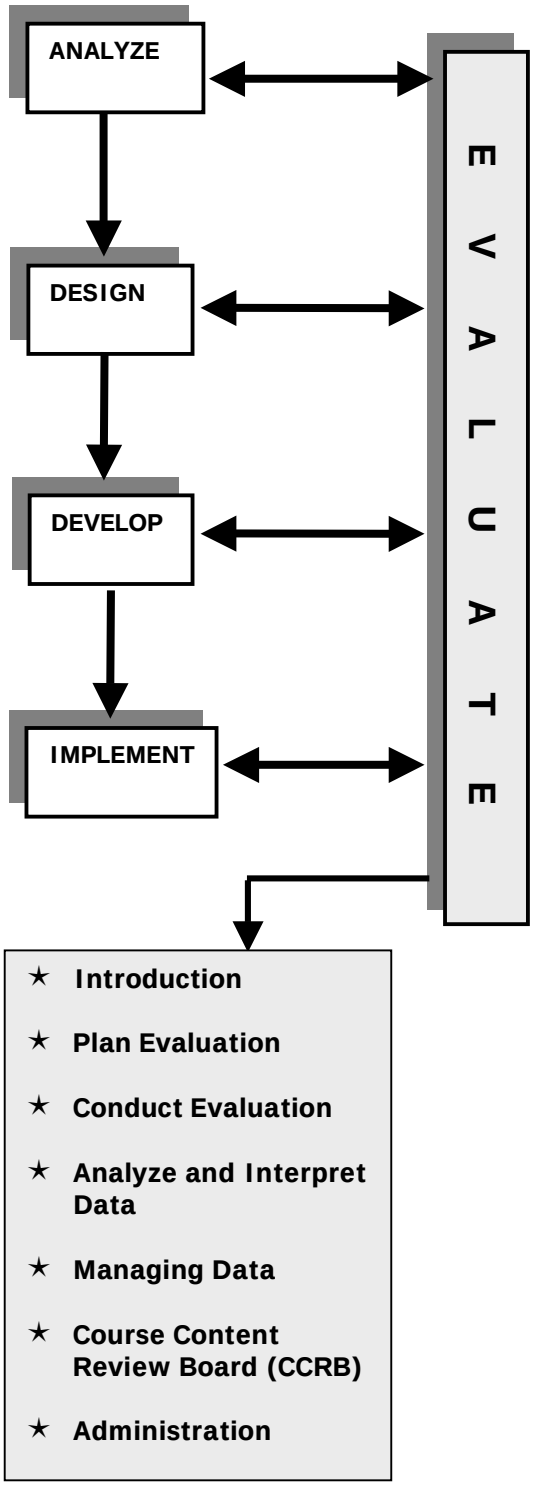
4. Make Recommendations Recommendations come in the form of instructor comments. These recommendations are based on the instructor's analysis of the identified trends. Recommendations to revise instruction should include the following:

a. A statement of the problem (for example, only 10% of the students stated that their knowledge increased as result of the lesson).

b. The probable cause(s) of the problem (for example, the lesson is written for a much less experienced target population).

c. All possible alternative solutions to the problem. (For example, a suggested solution may be to redesign the lesson for the experienced target population or make the lesson a self-paced homework assignment).

EVALUATE PHASE



In Chapter 5:

Chapter 5

5000. INTRODUCTION

The purpose of the Evaluate Phase of the Systems Approach to Training (SAT) is to determine the effectiveness and efficiency of an instructional program. This chapter provides guidance for a systematic and standardized approach to assessing the effectiveness and efficiency of an instructional program in each phase of the SAT. It details specific steps, the evaluation instruments used, and statistical methodologies to allow easy reference on how to conduct, analyze, and interpret evaluation results. Evaluation data is used to ensure that instruction is providing the Marine Corps with combat-effective Marines; to monitor the allocation of funding and resources for an instructional program; and to provide the basis for decision-making concerning the maintenance, revision, continuation, or termination of an instructional program. Using the processes and procedures outlined in this chapter, formal schools and unit commanders can establish a systematic evaluation program to evaluate instruction, identify training deficiencies, document evaluation results, and make recommendations for use by decision-makers to modify, continue, or terminate a program.

This chapter has six sections. The first five cover the five Evaluate Phase processes and the six provides some administrative responsibilities:

1. Plan Evaluation This section provides an introduction to the types of evaluation and guidance for determining the focus of an evaluation.

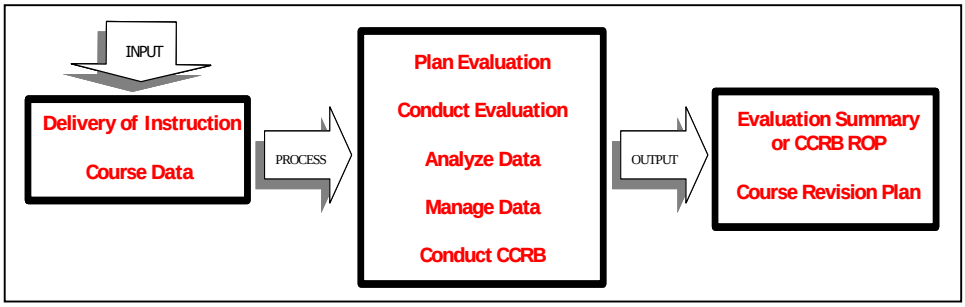
2. Conduct Evaluation This section provides how evaluation takes place within each phase of the SAT to provide checks and balances. It addresses specific ways to conduct evaluation for each phase of the SAT process.

3. Analyze Data This section takes the evaluator through the steps of organizing, quantifying, interpreting, and summarizing data so that information supporting changes can be presented in a Course Content Review Board (CCRB).

4. Manage Data This section addresses how to manage the documentation of evaluation results and recommendations for revising or refining an instructional program.

5. Conduct Course Content Review Board (CCRB) This section addresses how to prepare and conduct for a CCRB.

6. Administration This section references the directives requiring evaluation at the formal school/detachment. It also covers developing an evaluation plan, how to sample a population, and the design of evaluation instruments.



5100. PLAN EVALUATION

SECTION 1

Thorough and systematic planning is key to a successful evaluation. For an evaluation to provide the information required for making decisions concerning an instructional program, the evaluation must identify the critical evaluation issues and topics influencing the program. These topics will define the focus of the evaluation. Potential evaluation questions, criteria, and issues need to be identified and specific evaluation topics selected. Recognizing important questions and avoiding minor issues will enhance the merit of the evaluation by providing the data required for making informed decisions about an instructional program. This section provides an introduction to the types of evaluation and guidance for determining the focus of an evaluation. A few questions are listed in Figure 5-1 to assist in providing focus to the evaluation process by establishing the need.

QUESTIONS FOR DETERMINING EVALUATION NEED

1. Does the instructional program affect a large segment of the Marine Corps?

2. Are many iterations of the instructional program planned? Normally, a one-time program will not be evaluated.

3. Have instructional program deficiencies been identified by the using command(s)?

4. Has there been an equipment change, technology advance, or doctrinal change that may affect the instructional program?

5. Will evaluation information affect important instructional program decisions scheduled to take place? Such decisions may relate to course content, course length, funding, continuation, instructor requirements, or student throughput.

Figure 5-1. Questions for Determining Evaluation Need

5101. IDENTIFY EVALUATION TYPE

There are two types of evaluation. A distinction between the two types of evaluation can be made by first determining when the evaluation will be conducted; and then, what will be the focus of the evaluation.

1. Formative Evaluation Formative evaluation is conducted during the development of an instructional program. It is also possible to conduct formative evaluation through the first iteration of implementation, but this is not the preferred method for validating instruction. Validating instruction (formative) will involve content reviews by Subject Matter Experts (SME), Process Action Teams (PAT), and field trials. These validation methods are discussed in more detail in Chapter 3, Section 3402. Formative evaluation will never assess student performance, will rarely assess instructional environment, and will only occasionally assess instructor performance. Formative evaluation provides information useful for improving an instructional program and leads to decisions concerning instructional program development. For example, during the development of a course curriculum, formative evaluation could involve review of Individual Training Standards (ITSs)/Training and Readiness (T&R) Manual, content review of course materials by SMEs, and validation of instruction. Formative evaluation results in feedback for the curriculum developer, who then uses the information to make the necessary revisions to course materials (e.g., lesson plans, student materials, media, test items).

The primary object of formative evaluation is to review the effectiveness and efficiency of course materials and to make any revisions necessary prior to implementation of the course materials.

2. Summative Evaluation Summative evaluation is conducted after a Program of Instruction (POI) has been implemented. It provides judgments about a program's worth or merit. This type of evaluation can be conducted by schoolhouse personnel or by personnel external to the school (i.e., a TECOM instructional system specialist). Summative evaluation leads to decisions concerning program improvement, continuation, extension, or termination. For example, after a course curriculum is completely developed, a summative evaluation might be conducted to determine how well graduates are performing on the job following instruction. Summative evaluation assesses effectiveness of student performance, course materials, instructor performance, and/or instructional environment. Summative evaluation can also be a comprehensive assessment of all these factors to evaluate the instructional program's overall effectiveness and efficiency.

Summative evaluation leads to decisions concerning program improvement, continuation, extension, or termination.

5102. IDENTIFY EVALUATION ISSUES

A school commander must identify the curriculum and instruction issues to be addressed during the evaluation so that the proper information can be gathered to determine the effectiveness of the program.

1. Gather Information The evaluator begins the identification process by generating an exhaustive list of potentially important questions, criteria, and issues. Possible questions to use for each phase of the SAT process can be found in the next section. To develop this comprehensive list, the evaluator must gather information from a variety of sources including:

a. **Subject Matter Experts, instructors, students, and managers to identify questions, concerns, and goals regarding the instructional program and formal school/detachment. The evaluator should focus on obtaining input from those individuals who are or will be affected by the results of the evaluation.**

b. **Existing curriculum, instructional documentation, previous evaluation data, Marine Corps directives, local Standing Operating Procedures (SOP), and other appropriate doctrinal publications.**

2. Select Evaluation Topics It is usually not feasible to address all issues in one evaluation. Practical considerations, such as availability of resources and time constraints, will limit what can be addressed. If resources are not available and the evaluation is critical, it must be postponed until they are available. The evaluator must narrow the scope of the evaluation to address the most critical questions and issues affecting the instructional program. The conduct of the evaluation will be driven by the topics selected. Figure 5-2 provides criteria that can be used for selecting evaluation topics.

Criteria That Can Be Used in Selecting Evaluation Topics
a. Who will use the information?
b. Issues that reduce present uncertainty, provide information not already available, or yield important information.
c. Issues that address a critical concern of the instructional program.
d. Issues that, if not addressed, seriously limit the scope or comprehensiveness of the evaluation.

Figure 5-2. Criteria Used in Selecting Evaluation Topics.

In addition to the above criteria, the selection process may also be based on decisions that will be made as a result of the evaluation. These can include decisions concerning:

a. **Whether instructional needs are being met.**

b. **The development or acquisition of new training aids, devices, or systems.**

c. **The continuation, modification, expansion, or termination of an instructional program.**

d. **The extent to which the instructional program is being implemented as designed.**

e. **The relative value/cost of an instructional program compared to comparable programs.**

5103. SELECT EVALUATION APPROACH

Once the focus of the evaluation is defined, the evaluation approach is selected. Three approaches to evaluation are recommended for use in the Marine Corps: objectives-oriented, management-oriented, and operational test and evaluation. These approaches are based on the goal of the evaluation; they determine the focus of the evaluation but do not change the procedure for conducting evaluation.

1. Objectives-Oriented Evaluation The objectives-oriented approach determines the extent to which learning objectives have been achieved. It is the most common evaluation approach used in the Marine Corps. Information obtained from such an evaluation can be used to revise the goals of the instructional program, the program itself, or the instruments and methods used to measure instructional effectiveness. Figure 5-3 describes the focus of objective-oriented **evaluation.**

When using Objective-Oriented Evaluation, the focus is on determining whether:
a. Students master the learning objectives. b. Learning objectives meet the goal(s) of the program and support the Individual Training Standards (ITS). c. The standards in the learning objectives are realistic and obtainable. d. Student tests support learning objectives. e. Graduates are able to perform the tasks in the operating forces.

Figure 5-3. Objective-Oriented Evaluation.

2. Management-Oriented Evaluation The management-oriented approach to evaluation entails collecting information to aid management decision-making as an instructional program operates, grows, or changes. This approach enables the school director to determine if an instructional program responds to changes in technology, resources, new developments in instruction, or day-to-day operations. For example, if an upgrade to a computer program for inventory control is being implemented, the school director may direct that an evaluation be conducted to determine the upgrade's affect on the instructional program. The formal school/detachment's concerns, informational needs, and criteria for instructional effectiveness guide the direction of the evaluation. Figure 5-4 provides how management-oriented evaluation assists the decision-maker.

When using Management-Oriented Evaluation, the approach allows decision-makers to:
a. Determine what instructional needs or objectives should be addressed to provide a basis for assessing the effectiveness of instruction. For example, the introduction of new equipment would identify a need to revise learning objectives and create or modify a lesson plan to incorporate instruction on that equipment.
b. Determine resource requirements and their availability and adaptability to alternative instructional strategies. The decisions may facilitate the design of the instructional program and, ultimately, provide the formal school with a basis, for assessing how well the program is being implemented. For example, instruction on a new piece of equipment may require additional instructors or specialized training equipment that traditional lecture/demonstration methods do not support. Alternative strategies, such as Mobile Training Teams (MTT), distance learning, Computer-Based Training (CBT), etc., may be proposed.
c. Determine how well a program is being conducted, what barriers threaten its success (e.g., lack of resources, instructors, facilities), and what revisions are required. Once these questions are answered, instructional or administrative procedures can be monitored, controlled, and refined. For example, an evaluation of instructor performance and instructional environment may indicate a need to increase instructor preparation time or improve the instructional environment.
d. Determine whether to continue, modify, or refocus a course of instruction. An evaluation of graduate performance on the job will provide data to aid these decisions.

Figure 5-4. Management-Oriented Evaluation.

3. Operational Test and Evaluation Operational test and evaluation is an approach that enables the evaluator to determine whether a product represents a significant improvement or benefit over alternative products. Example products include an off-the-shelf instructional program, an instructional method or media, a training system/device, etc. This approach is effective when an existing product is being evaluated for implementation. This approach also allows the evaluator to assess the effectiveness of a product while it is still under development. When determining whether an alternative product represents an improvement over an existing product, the evaluator should consider the following factors: cost, benefits, effectiveness, and feasibility. Figure 5-5 provides how operational test and evaluation assists the decision-maker.

Figure 5-5. Operational Test and Evaluation.

When using Operational Test and Evaluation, decision-makers are able to consider:
a. **Cost.** Cost is analyzed to determine if it will be cost efficient to invest in an alternative product or upgrade the existing product. b. **Benefits.** This analysis includes determining how the benefits among products will be measured. The analysis results in the determination of whether the benefits are worth the expenditure of resources (e.g., time, money, personnel) to implement. c. **Effectiveness.** An analysis of product effectiveness is performed to determine whether an alternative product will be more effective than an existing product in meeting the goals of the instructional program. d. **Feasibility.** A final analysis is that of feasibility. How feasible would it be for the school to invest the resources necessary to educate their personnel and structure/acquire the facilities required to use the alternative product? If the benefits and effectiveness of the alternative product are minimal, would it be feasible to alter the school budget to implement an alternative product?

5200. CONDUCT EVALUATION

SECTION 2

In Marines Corps training, the revision of courses is paramount to meeting the needs of the operating forces. Whether it is affected by new equipment, new orders, or new technology, how a task is performed in the operating forces can change (and does more often in some MOSs than others). Formal schools/detachments must be prepared to obtain data/information compiled from different phases of the SAT process to improve the product. As the SAT model shows on page 5-0, evaluation can require revisiting any phase of the SAT process. The diagram in Figure 5-6 shows the variety of routes that can be taken in evaluation.

This section provides how evaluation takes place within each phase of the SAT to provide checks and balances. This section allows the user of this manual to address specific ways to conduct evaluation for each phase of the SAT process. For a new course being developed, this process shows how evaluation (formative) occurs during the initial stages of course development when limited data is available. Evaluation during this time can reveal potential problems prior to course implementation. Existing courses (summative), however, will have data that is used to assist in identifying the strengths and weaknesses within the course as it is. Evaluation instruments have been identified and information is provided on conducting the evaluation. However, specific guidelines on the development of evaluation instruments and sampling a population can be found in Section 5600. Referrals to other sections are made regarding how data is analyzed and interpreted after it is collected.

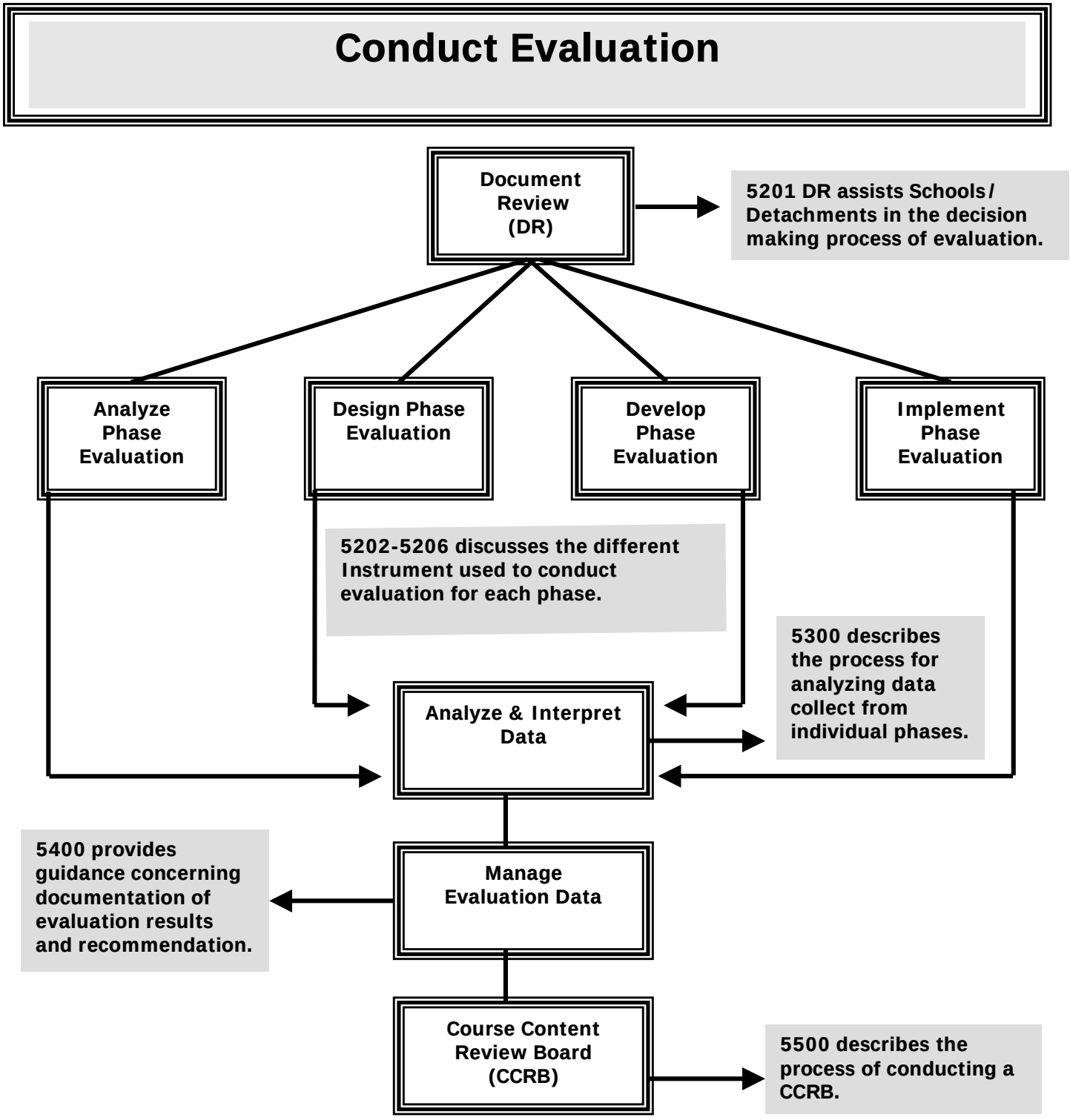


Figure 5-6. Course Evaluation.

5201. DOCUMENT REVIEW

During any stage of the evaluation process, a review of documents significant to the course and school can assist in the decision-making process and approach to evaluation. Some of the documents listed may or may not be available depending on whether the evaluation is for a new course/school or an existing course. Additional documents to those discussed here may also be identified. Listed below are documents to be discussed in more detail later in this section.

1. **Individual Training Standard (ITS) Order/Training and Readiness (T&R) Manual**
2. **Course Descriptive Data/Program of Instruction (CDD/POI)**
3. **Master Lesson File (MLF)**
4. **School's Standing Operating Procedures (SOP)**
5. **School's Evaluation Plan**
6. **Inspection Reports/Assist Visit Reports (if applicable)**
7. **Record of Proceedings (ROP)**

1. Individual Training Standard Order/Training And Readiness Manual The ITS/T&R defines the training requirement and serves as the base on which instruction is built. Therefore, the ITS/T&R must always be reviewed to determine if there is a disconnect between the curriculum and the training standard. Take for instance, if evaluation data has indicated a problem with Terminal Learning Objectives (TLOs), then it is probable that the problem is with the construct or content of the ITS/T&R event. Chapter 2, Section 2204, provides the procedure for downgrading the TLO if a problem like this is revealed.

2. Course Descriptive Data/Program Of Instruction (CDD/POI)
All existing courses will have a CDD and POI according to MCO 1553.2_. These documents (maintained in MCAIMS) provide the resources required for the course, learning objectives, instructional hours, number of instructors required for each class, methods and media and more. This information is vital to the evaluation of a course. For example, an evaluator needs to ensure that the class reflects the POI. If there are problems with the approved Program of Instruction, then the data needs to be gathered so that it can be presented at a Course Content Review Board (CCRB). Refer to Chapter 3, Section 3500 for more information on CDD/POI.

3. Master Lesson File (MLF) An MLF is required for each class that is taught in the course. All of the documentation required to conduct the class is in the MLF. More information on specific contents can be found in Chapter 3, Section 3600. If the course is new, then this file will not be produced until the end of the develop phase. For existing courses, the MLF is of great value for comparing data results with what is in the MLF. For instance, if a student comments on an Instructional Rating Form (IRF) that numerous words are misspelled in the student handout, then the MLF can be pulled and checked for misspelled words. If the words are not misspelled in the MLF, then there is an internal problem that exists; the MLF is not being used as THE source document.

4. School Standing Operating Procedures (SOP) The school's SOP or Academic SOP specifies Academic policy for the school. The SOP may provide information on how data is gathered and compiled for the school and the resources available to provide evaluation data. This is key information for evaluation of the design, develop, implementation, and evaluate phases. This document may not be available to a new school, but needs to be developed to provide policy and procedures. A checklist providing some key elements to include in an SOP can be found in APPENDIX E.

5. Evaluation Plan The evaluation plan needs to be reviewed so that there is an understanding of the evaluation process in accordance with school policy. At some schools, the evaluation plan may be found in the school's SOP. Refer to Section 5602 for more information on an evaluation plan.

6. Inspection Reports/Assist Visit Reports Some Military Occupational Specialties (MOSs) have inspection teams that visit the operating forces to ensure that the standards required by the Marine Corps are adhered to. If possible, retrieve information revealing strengths and weaknesses from the operating forces so the school can then use the data to assist in the improvement of the instructional program. The challenge comes in determining whether the strengths/weaknesses are linked to the schoolhouse, the operating forces, or both.

7. Record Of Proceedings (ROP) The ROP provides documentation of the discussion items and recommendations made during a Course Content Review Board (CCRB). For existing courses, this provides data for recommended changes, additional operational needs that were identified, additional resource needs at the schoolhouse, etc. Sometimes, the ROP will reveal areas where additional information/data needs to be collected to determine or support needs that were identified during the CCRB. Refer to section 5500 for more information on the ROP and CCRBs.

5202. ANALYSIS PHASE EVALUATION

Data is collected during the Analysis Phase to identify the task list, ITS, Instructional Setting, and the Target Population Description (TPD). Through the methods discussed in Chapter 1, the products of the Analysis Phase are determined by TECOM. Methods of evaluation are established to ensure the accuracy of the outputs from the Analysis Phase. If evaluation data at the formal school/detachment identifies a problem with the outputs, then all supporting data is sent to the Task Analyst at TECOM. The questions in Figure 5-7 are a few questions that will assist in examining the outcomes of the Analysis Phase.

Evaluating the Analysis Phase
1. Does the ITS reflect the task necessary to perform the job in the operating forces? 2. Does the task analysis include all of the prerequisite skills and knowledge needed to perform the learning goal and is the prerequisite nature of these skills and knowledge accurately represented? 3. Does the environment accurately replicate, within the confines of resources, the environment where the job is performed? 4. Does the target population description accurately define those who perform the task?

Figure 5-7. Evaluating the Analysis Phase.

CONDUCT EVALUATION

An Analysis Phase review occurs prior to the development of instructional materials of a new course. A review may take place for an existing course due to the end of course evaluation and post-course data indicating a gap between what is taught at the school and what is being performed in the operating forces. In accordance with MCO 1200.13E, a Front-End Analysis (FEA) is initiated when job requirements change or a performance deficiency is detected. This, too, is a type of Analysis Phase review.

5203. DESIGN PHASE EVALUATION

During the Design Phase, knowledge and skills are identified, learning objectives and test items are developed, the delivery system is selected, and the sequence of instruction is determined. Methods of evaluation must be established to ensure that these outputs are accurate. The questions in Figure 5-8 are questions that will assist in examining the outcomes of the Design Phase.

Figure 5-8. Evaluating the Design Phase.

Evaluating the Design Phase
1. Do the knowledge and skills accurately reflect what needs to be taught for each performance step?
2. Do the learning objectives support the ITSs?
3. Does the learning objective accurately and clearly state what knowledge/skill will be required for performing the job?
4. Does the test accurately measure the knowledge, skill, or the task being taught?
5. Are the testing methods appropriate to the subject matter (knowledge vs. performance-based)?
6. Do the test items consistently measure the same knowledge or performance?
7. Do the assessment instruments and their related mastery criteria reliably distinguish between competent and incompetent learners?
8. Is the delivery system selected appropriate for the level of knowledge that the target population will possess?
9. Is the sequence of instruction organized logically to enhance the process of learning the material?

CONDUCT EVALUATION

Throughout the Design and Develop phases of the SAT process, checklists are used to ensure accuracy and to guide decision-making. Checklists provide continuity to the process and a standard for the product. During the Design phase, checklists provide detailed questions on products of the Design phase. For new courses, these checklists must be completed and placed in the MLF for each class in the course. In existing courses, these should be reviewed if there are indicators that the products of this phase are flawed. The checklists are available in the appendices. Additional items can be added to the checklists to meet school needs.

Learning Analysis Worksheet (LAW) Checklist. The LAW checklist ensures that components are recorded from the ITS verbatim. It also checks to make sure that the knowledge and skills were identified and grouped for each performance step. The LAW checklist can be found in APPENDIX C. Refer to Chapter 2, Section 2200, for more information on learning analysis.

Learning Objective Worksheet (LOW) Checklist. The LOW checklist ensures that the behavior, condition, and standard of the learning objectives are accurate and clear. The LOW checklist can be found in APPENDIX C. Refer to Chapter 2, Section 2202, for more information on learning objectives.

Test Item Checklist. The test item checklist ensures that test items replicate the behavior, standards, and conditions identified in the learning objectives. Many questions can be included on the checklist to require the test developer to assess each test question (knowledge or performance) for clarity and conciseness. The test item checklist can be found in APPENDIX C. Refer to Chapter 2, Section 2206, for more information on test items.

Construct a Test Checklist. The construct a test checklist ensures that the test is constructed to include detailed instructions, scoring criteria, appropriate grouping of test items, and any safety precautions. Refer to Chapter 2, Section 2300, for more information on constructing a test.

5204. DEVELOP PHASE EVALUATION

During the Develop Phase, the course schedule is determined, the media is produced, Master Lesson Files (MLFs) are created, and the CDD/POI is generated. Methods of evaluation must be established to ensure that these outputs are accurate. The questions in Figure 5-9 are questions that will assist in examining the outcomes of the Develop Phase.

Evaluating the Develop Phase
1. Does the content present a consistent perspective?
2. Do the instructional materials support the learning objectives?
3. Does the instructional method facilitate maximum learning?
4. Is the instructional method appropriate to the subject matter?
5. Are training aids suitable to the instruction and subject matter?
6. Are examples, practice exercises, and feedback realistic and accurate?
7. Is the approach consistent with current instructional theory in the content area?
8. Is sufficient time allotted for instruction and practice?

Figure 5-9. Evaluating the Develop Phase.

CONDUCT EVALUATION

Several forms of evaluation take place during the Develop phase. For both a new and existing course, checklists are used to evaluate the products of the phase. For a new course, the checklists are completed and placed in the MLF as source documents. Once the course development is completed, then validation takes place so that problems with the Program of Instruction (POI) are identified prior to implementation. When evaluating an existing course, the checklists in the MLF are still referenced and reviewed periodically. If evaluation indicates problems with the POI, then the checklists need to be reviewed. However, reviewing the checklists may not identify the problem and an expert review may be required. An expert review, not to be confused with an SME review, is discussed in more detail below. Figure 5-10 shows the different course that evaluation takes depending upon whether the course is new or existing.

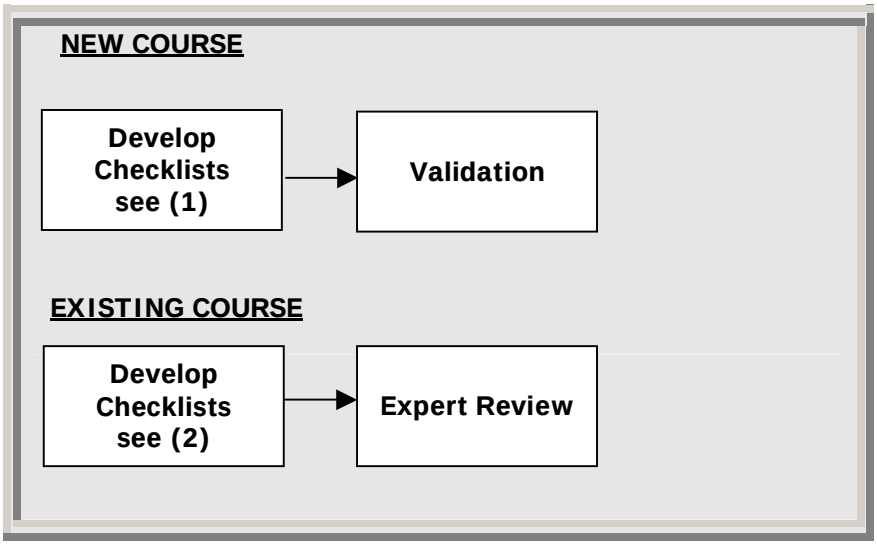


Figure 5-10. Conduct of Evaluation in the Design Phase.

1. **Develop Phase Checklists** During the Develop phase, checklists provide detailed questions on products of the develop phase. The checklists are available in the appendices. Additional items may be added to the checklists to meet school needs.

a. **Concept Card Checklist** The concept card checklist ensures the contents and accuracy of the necessary components of the concept card. The concept card checklist can be found in APPENDIX C. Refer to Chapter 3, Section 3200, for more information on concept card.

b. **Lesson Plan Checklist** The lesson plan checklist ensures that each component required in a lesson plan is present and complete. The lesson plan checklist can be found in APPENDIX C. Refer to Chapter 3, Section 3302, for more information on lesson plans.

c. **Student Outline Checklist** The student outline checklist ensures that each component required in the student outline is present. The student outline checklist can be found in APPENDIX C. Refer to Chapter 3, Section 3303, for more information on student outlines.

d. **Method/Media Checklist** The method/media checklist ensures that method and media used is consistent with the learning objective behavior. The method and media checklist can be found in APPENDIX C. Refer to Chapter 2, Section 2207, for more information on methods. Refer to Chapter 2, Section 2208, and Chapter 3, Section 3304, for more information on media.

2. **Expert Review** An expert review can be held for further examination of the design and develop phases. These types of reviews are where experts review the material prior to implementing the instruction. An expert review is different from a Subject Matter Expert (SME) review in that the expert review involves more than SMEs. The experts may include: SMEs, seasoned curriculum developers, and/or experienced education specialists. During a content review, an SME examines the content of the instructional material for accuracy and completeness. Then an individual familiar with the target audience (could be someone from the operating forces) reviews for appropriateness. This individual may look at vocabulary, examples, and/or illustrations. The education specialist can evaluate presentation of the content with current educational thoughts and practices. Expert reviews can take place toward the end of the design phase or at the beginning of the develop stage for a new course. If an existing course, then this review can take place at any time.

3. **Validation** The process of validation occurs for new courses prior to implementation. The best indication of whether the instruction is effective is to try it out on a representative population of who is expected to be in the classroom. This will provide information on how well the learners are able to learn and the problems encountered with the instruction in its current form. Validation allows changes to be made prior to the implementation of the instruction. Methods of validation are covered at length in Chapter 3, Section 3400.

5205. IMPLEMENT PHASE EVALUATION

During the Implement Phase, instruction is delivered. Evaluating the outcome of instruction is imperative to identifying the strengths and weaknesses of the course as a whole. The implement phase is where most evaluation data is compiled at the formal school/detachment. Once a course is implemented, evaluation is conducted for each iteration of a course. Since this is a continuous process, it is important that each school have an evaluation plan in place to ensure that data is collected properly and that there is standardization. More information on writing an evaluation plan can be found in Section 5602. The four common topics evaluated in the Implementation Phase are course materials, instruction, instructional environment, and student performance. The questions in Figure 5-11 are questions that will assist in examining these four topics.

Figure 5-11. Evaluating Implementation.

Evaluating Course Materials
1. Do the instructional materials support the learning objectives?
2. Is the student outline easy to follow?
3. Are training aids suitable to the instruction and subject matter?
4. Are the test instructions clear and understandable?
5. Is the format of the test easy to follow? (Students don't have to flip pages, like questions are grouped together, etc.)
6. Do students have all of the materials (equipment, calculator, etc.) necessary to complete the test?
7. Do students use the course materials available to them?

Evaluating Instructor
1. Is the instructor's presentation of instruction effective?
2. Does the instructor promote student participation?
3. Does the instructor provide feedback to the students?
4. Does the instructor have sufficient knowledge of the course material?
5. Does the instructor communicate and interact effectively?
6. Does the instructor utilize media effectively?
7. Is the administration of tests effective?

Evaluating Instructional Environment
1. Does the instructional setting facilitate maximum learning?
2. Do available resources allow the course to be as performance-based as possible?
3. Is the instructor to student ratio adequate?
4. Is the instructional environment appropriate to the subject matter and realistic to the job setting?

Evaluating Student Performance
1. Are students mastering the learning objectives?
2. Are students able to perform tasks?
3. Are there test items or tasks that students repeatedly have problems mastering?

CONDUCT EVALUATION

Figure 5-13 provides a breakdown of which instruments are used to provide data regarding course materials, instruction, instructional environment, and student performance, how the instrument is used, when it's used, and who completes the instrument. Most of the instruments will fall under more than one category. As identified in Figure 5-13, evaluation data for the implement phase is gathered during the course, immediately following the course, and even three months following the course. When reviewing data, keep in mind that all data has to be considered to get a true picture of instruction. Once the data is compiled, it is then compared and analyzed so that trends between classes can be identified.

1. **Instructional Rating Form (IRF)** The IRF is a student reaction form to instruction. Common types of feedback revealed by IRFs can be found in Figure 5-12. Information provided by the students can identify areas of strengths and weaknesses in a lesson. However, this should not be the sole indicator of proficiency or effectiveness. For every block of instruction, the IRF is distributed at the beginning of class to, at a minimum, 10 percent of the students. Students are provided time to complete the forms at the end of the class. The school SOP may designate a higher percentage of IRFs to be completed for each class, but it must be at least 10 percent. Students should be informed that IRFs are not restricted to the selected individuals and that anyone in the class can complete an IRF at any time. IRFs provide the student's immediate reaction to the lesson. Specific information regarding a particular lesson may be lost unless data is gathered for each lesson. A sample IRF can be found in APPENDIX D. Data from the IRF is transferred to the After Instruction Report (AIR) where the instructor also makes comments regarding the lesson. The AIR is discussed in detail later in this section and in Chapter 4, Section 4500. Information regarding quantifying and interpreting the results of questionnaires can be found in Section 5302.

Common Types of Feedback from Student Reaction Forms	
Progress with Objectives:	Did the instruction meet the stated learning objectives met?
Class Content:	Did the content make sense?
Instructional Materials:	Were the materials useful?
Pre-Work Materials:	Were the pre-work materials necessary? Helpful?
Assignments:	Were the out-of-class assignments helpful?
Methods of Delivery:	Was/Were the method(s) of delivery appropriate for the objectives?
Instructor/Facilitator:	Was/Were the facilitator(s) effective?
Overall Evaluation:	What is your overall rating of the lesson/course?

Figure 5-12. Common types of Feedback from Student Reaction Forms.

2. **End of Course Critiques (ECC)** Like the IRF, the ECC is also a student reaction form. It provides feedback on the areas listed in Figure 5-14. However, the ECC references the course in broader terms than the IRFs. This particular instrument reveals information on the course as a whole. ECCs should, if possible, be completed by 100 percent of the class. These critiques are completed after the program of instruction is complete. Students that may not have filled out an IRF or ERF during these periods may apply comments on the ECC in the areas of instruction or evaluation. An example of an ECC can be found in APPENDIX D. Any information specific to a lesson gathered from the ECC is documented on the AIR for that lesson. The AIR is discussed in more detail later in this section and in Chapter 4, Section 4500. Information regarding quantifying and interpreting the results of questionnaires can be found in Section 5302.

3. **Instructor Evaluation Checklist** This particular checklist is used when evaluating an instructor. The Instructor Evaluation Checklist critiques the same elements that are evaluated at the Formal School Instructor Course (FSIC), Instructional Management School. FSIC graduates have been taught and evaluated on all of the items of this checklist. The Instructor Evaluation Checklist reflects Marine Corps requirements for formal school/detachment instructors to provide standardization to instruction. It covers platform techniques, thorough coverage of the lesson, questioning techniques, communication skills, employment of method/media, and instructor/student interaction. Additional requirements can be added to the checklist by schools, but the requirements should not be modified unless revised and adopted by the Instructional Management School and TECOM. The evaluators of instructors need to be graduates of the FSIC so that they are familiar with the requirements. The Instructor Evaluation Checklist can be found in APPENDIX E. Information regarding quantifying and interpreting the results of a checklist can be found in Section 5302.

4. **Observation Checklist** An observation checklist is available to be used by an evaluator who is reviewing a class in session. The class may be in a classroom setting or field setting. This checklist provides a list of items to assist in evaluating course materials, instruction, instructional setting, student interaction, and class exercises. Unlike the Instructor Evaluation Checklist, the focus provided by this checklist is not on the instructor, but rather on class content and effectiveness. This checklist allows an observer to evaluate whether the instruction, student materials, and media follow the lesson plan and materials submitted in the MLF. This checklist allows room for other comments by the observer. Comments may include recommendations to change the method, media, student materials, instructional environment, etc. If the changes are minor, then they may be made immediately. Otherwise, data gathered from the checklist remains as documentation for the next convening Course Content Review Board . Evaluators should be familiar with the program of instruction, graduates of the Curriculum Developers Course (CDC), and graduates of the Formal School Instructor Course (FSIC). The frequency of observations can be determined in the school SOP. An example of an observation checklist can be found in APPENDIX E. Modifications, as far as additions, can be made to this checklist to meet the needs of the schoolhouse. Information regarding quantifying and interpreting the results of a checklist can be found in Section 5302.

5. **Environment Checklist** The environment checklist reveals information about physical conditions and training conditions. If training takes place in a classroom environment, then information regarding lighting, noise, classroom setup, ventilation, room temperature, etc., is available through an environment checklist. This checklist can be completed by the instructor prior to the class or by a classroom observer during the class. An environment checklist for training that occurs outside of a classroom can reveal information about setup and availability of equipment, ventilation, noise, facilities, and the overall conditions that training took place under. Safety can be included in the environment checklist to eliminate the additional safety checklist. An example of an environment checklist can be found in APPENDIX E. Information regarding quantifying and interpreting the results of a checklist can be found in Section 5302.

6. **Safety Questionnaire** The safety questionnaire is distributed to students so that the student has an opportunity to assess whether he/she was informed about safety issues. Were students provided ample instructions regarding safety? Was safety emphasized in the instruction? Did the instructor exemplify safety in the training environment? The formal school/detachment's SOP may have specific guidelines to how this is assessed. Courses where students are exposed to potentially dangerous situations must ensure that Operational Risk Management (ORM) is referenced. Refer to MCO 3500.27 for more information on ORM. A sample safety questionnaire can be found in APPENDIX D. Information regarding quantifying and interpreting the results of a questionnaire can be found in Section 5302.

7. **Safety Checklist** This checklist is to be completed by the instructor or a qualified observer. The items on the checklist indicate whether the training facility has been set up to present a safe working environment. It can also be used in addition to the observation checklist to provide information on whether the instructor provided ample instructions regarding safety, emphasized safety, and practiced safety in the training environment. Courses where students are exposed to potentially dangerous situations must ensure that Operational Risk Management (ORM) Policy is referenced. An example of a safety checklist can be found in APPENDIX E. Information regarding quantifying and interpreting the results of this questionnaire can be found in Section 5302.

8. **Examination Rating Form (ERF)** Immediately following an examination (performance or written), ERFs are distributed to, at a minimum, 10 percent of the students. Students are advised that these forms will not be viewed until after the students have received their grades for the test. The ERF allows the school to assess the students' perception of a test's suitability and fairness. This does not provide the students with the final say on the validity of the test, nor does it suggest that their judgment is necessarily accurate. However, it does provide the students' reactions to the test providing information that cannot be assessed through mere test scores. This information can be used to adjust confusing questions, instructions, facilities, equipment, etc. The results should be indicated on the After Instruction Report (AIR) of the class teaching the learning objectives tested. The AIR is discussed in detail later in this section and in Chapter 4, Section 4500. An example of an ERF can be found in APPENDIX D. Information regarding quantifying and interpreting the results of this questionnaire can be found in Section 5302.

9. **Practical Application/Class Exercises** Practical application and class exercises are evaluative tools that the instructor(s) use to assess the progress of students. If students are having a particular problem with a practical application or during a class exercise, then it may be necessary to make adjustments in the training schedule (late training day or extra work during lunch) to spend more time on the problem area. This is especially necessary when the course builds on elements learned in previous material. This information needs to be annotated under "Instructor Comments" on the After Instruction Report (AIR) for documentation.

10. **Tests** During the Course Implementation Stage, pre-test, written examinations, and performance examinations can be given. Each test has a different purpose. This is discussed more in-depth in Chapter 2, Section 2301. Test scores reveal how well an individual in the class performed. Item analysis reveals how well students performed on each item in comparison with the rest of the class. This information should be tracked over time and aids in determining the validity and reliability of the test. Refer to Section 5302 for more information on test analysis and determining the validity and reliability of tests.

a. **Pre-Test** The results of a pre-test can be used for tailoring instruction to the target audience. It can also be used to compare with post-test data to determine if instruction was effective. For instance, if students are unable to perform a task before instruction, but can perform that task after instruction, a general determination can be made as to the effectiveness of instruction. Of course, there are other factors outside of instruction, such as peer teaching and additional reading, that may have attributed to learning.

b. **Performance/Written Examinations** Results from performance and written examinations reveal whether the student has mastered the learning objectives. Test scores can be compared, specific problem items can be identified and linked to specific classes or learning objectives, and defective test items can be identified. Refer to Section 5302 for more information on test analysis.

5206. INSTRUMENTS USED FOR OVERALL COURSE EVALUATION

The instruments discussed above have been specific to course materials, instructor, instructional setting, or student performance. This section will discuss student data forms, after instruction reports (AIR), post-graduate surveys, and site visits normally associated with the formal Evaluation Phase of the SAT process. Questions that these evaluation instruments can be designed to answer are found in Figure 5-13.

Questions for Course Evaluation
1. Who is represented in the student population?
2. Have there been changes to the method of performing the task?
3. Are tasks performed differently in the operating forces?
4. Is there new equipment or computer programs being used in the operating forces?
5. Has the environment changed?
6. Are students who pass the test (evaluation) able to perform their job successfully?
7. Do supervisors feel confident in the graduates from the formal school/detachment?
8. Do the students feel confident in the skills taught at the formal school/detachment when they get to the operating forces?
9. Do graduates of the course believe non-essential instruction is contained in the instructional program?
10. Are graduates performing well on the job?
11. Are graduates performing better than they did before instruction?
12. What tasks are causing graduates difficulty on the job?

Figure 5-13. Questions of Evaluation.

1. **Student Data Form** Student data will reveal information about the population. This data is generally collected at the beginning of the course. Some of the student data may be available from By-Name Assignment (BNA). A student data form completed by the student reveals background knowledge, computer experience, student expectations, language proficiency, etc. This data can be helpful in determining why students do particularly well or not so well on a test.

2. **After Instruction Report (AIR)** An AIR is a report that consolidates the student reaction, instructor reaction, and test scores into one form so that data analysis can be performed. An example of AIR can be found in APPENDIX F. Refer to Chapter 4, Section 4500 for information on how an AIR is completed.

3. **Post-Graduate Survey** The post-graduate survey is developed to assess how well the graduate felt that he/she was prepared for his/her job. It can also be developed to find out types of equipment being used, computer programs used, content not covered, suggestions/recommendations, etc. Post-graduate surveys are course specific and sent to graduates approximately 3 months after graduation. For courses with extenuating circumstances where graduates are being delayed from performing the job, e.g., a backlog of obtaining security clearances, the timeframe may be extended up to 120 calendar days after the graduation month. Document the reasons for extending the 90-day timeframe. Surveys can be mailed, emailed, or used for interviewing graduates over the phone or in person. An example of how to prepare a post-graduate survey can be found in APPENDIX D.

4. **Site Visit** Site visits provide the school with an opportunity to visit where graduates from the school will perform their duties. Both interviews and observations can be conducted during a site visit. Environment, work conditions, and equipment can be viewed, while allowing schoolhouse representatives to conduct interviews with supervisors and graduates. Representatives from the schoolhouse need to possess a thorough knowledge of the instructional programs related to the site to be effective. Additionally, they need to possess knowledge of educational and training principles so that recommendations for improvement to the program can be documented and presented at the next CCRB.

a. **Observation** Observation will reveal the environment that the graduate contends with, how well he/she is able to perform in the environment, how well he/she implements what was taught in the course, and how well what was taught in the course coincides with what is happening in the operating forces. Developing a checklist for use during the observation provides a standard of comparison. When observing graduates, it is recommended to observe recent graduates as well as graduates who have been in the operating forces for a while. This provides the ability to compare what is learned through on-the-job training and the consistency between operating forces and the formal school/detachment. An example of an observation checklist can be found in APPENDIX E. Section 5302 provides guidance on how to quantify and interpret data from a checklist. Designing checklist is covered in Section 5603.

b. **Interview** During a site visit, interviews are conducted with supervisors and graduates from the course. Supervisors and graduates will provide different information. Therefore, these interviews should be conducted separately and the evaluation instruments should be developed with the intended audience in mind (graduate or supervisor). Although site visits are ideal for conducting such interviews, interviews can also be conducted over the phone or by email. Refer to Section 5603 for how to prepare for an interview. Section 5302 provides guidance on quantifying and interpreting data.

EVALUATION INSTRUMENTS OF THE EVALUATION PHASE				
Evaluation Topic	**Instrument Used**	**How Evaluation is Administered**	**When Conducted**	**Who Completes Instrument**
Course Materials	Instructional Rating Form (IRF)	Instructor distributes at the beginning of each lesson to a percentage (at a minimum, 10%) of students determined by local SOP.	Completed at end of each lesson	Student
	Observation Checklist	Observation checklist is used to review course materials during implementation. Normally completed by sitting in the back of the classroom with all of the paper-based course materials on-hand.	During Lesson	Curriculum Developer Academics
	End of Course Critique (ECC)	Instructor/academics distributes ECC to 100% of the class at the end of the course.	Completed at end of each course	Student
Instructor	Instructor Evaluation Checklist	Instructor is evaluated using the checklist. Normally evaluator sits at the back of the class to minimize distractions.	During Lesson	Academics
	Instructional Rating Form (IRF)	Instructor distributes at the beginning of the class to a percentage (at a minimum, 10%) of students determined by local SOP.	Completed at end of each lesson	Student
	End of Course Critique (ECC)	Instructor/academics distributes ECC to 100% of the class at the end of the course.	Completed at end of each course	Student
	Safety Questionnaire	Instructor distributes questionnaires at beginning of lesson.	Completed at end of lesson	Student
Instructional Environment	Instructional Rating Form (IRF)	Instructor distributes at the beginning of the class to a percentage (at a minimum, 10%) of students determined by local Standing Operating Procedures (SOP).	Completed at end of each lesson	Student
	Observation Checklist	Observation checklist is used to review instructional environment during implementation. Normally completed by sitting in the back of the classroom with all of the paper-based course materials on-hand.	During Class	Curriculum Developer Academics
	Environmental Checklist	Used by instructor to review environment prior to conducting the class. Good device for classroom management. An observer uses this instrument during the class.	Prior to Lesson During Lesson	Instructor Classroom observer

Figure 5-14. Evaluation Instruments of the Evaluation Phase.

EVALUATION INSTRUMENTS OF THE EVALUATION PHASE (Continued)				
Evaluation Topic	**Instrument Used**	**How Evaluation is Administered**	**When Conducted**	**Who Completes Instrument**
Instructional Environment (cont)	Safety Checklist	Instructor/observer completes to ensure that the training facility presents a safe learning environment.	Prior to Class During Class	Instructor Classroom observer
	End of Course Critiques (ECC)	Instructor/academics distributes ECC to 100% of the class at the end of the course.	Completed at end of each course	Student
Student Performance	Examination Rating Form (ERF)	Distributed by instructor after exam is complete to a percentage (at a minimum, 10%) of students. ERFs should not be viewed until after all students have received scores to eliminate any chance of bias during grading.	Immediately Following Exam	Student
	Practical Application/Lesson Exercise	A part of the standard curriculum that provides instructors an opportunity to informally evaluate how well the class is learning the material.	During the Lesson; Determined by Curriculum (approved lesson plan)	Instructor can note observation on the After Instruction Report (AIR) if needed
	Tests	Instructor administers the test in accordance with Program of Instruction (POI) and local Standing Operating Procedures (SOP).	Determined by Curriculum	Student
	End of Course Critiques (ECC)	Instructor/academics distributes ECC to 100% of the class at the end of the course.	Completed at end of each course	Student
Other Data Collected	Student Data Form	Instructor distributes to 100% of students to be completed at beginning of course.	Day one of Course	Student
	After Instruction Report (AIR)	Consolidated report of student reaction, instructor reaction, and test scores. Completed for every class.	Completed after each Lesson	Instructor
Graduate Performance	Post Graduate Survey	Mailed or emailed to 100% of graduates.	3 months after each graduation	Graduate
	Site Visits	Interviews, surveys, and observation checklists can be completed during the site visit.	Anytime	Instructor Curriculum Developer Academics

Figure 5-14. Evaluation Instruments of the Evaluation Phase (cont.).

5300. ANALYZE AND INTREPRET DATA

SECTION 3

Evaluations involve data analysis and interpretation to produce meaningful results. Data analysis reduces and combines information to make it easier to make comparisons for drawing conclusions. Interpretation involves making sense of the data so outcomes and relationships can be described, conclusions drawn, and recommendations made concerning any element of an instructional program. The decisions for creating, revising, maintaining, continuing, and improving an instructional program rests with sound data collection methods and thorough data analysis and interpretation. This section takes the evaluator through the steps of organizing, quantifying, interpreting, and summarizing data so that information supporting changes can be presented in a Course Content Review Board (CCRB). Figure 5-17 provides a diagram showing the process and steps of analyzing and interpreting data.

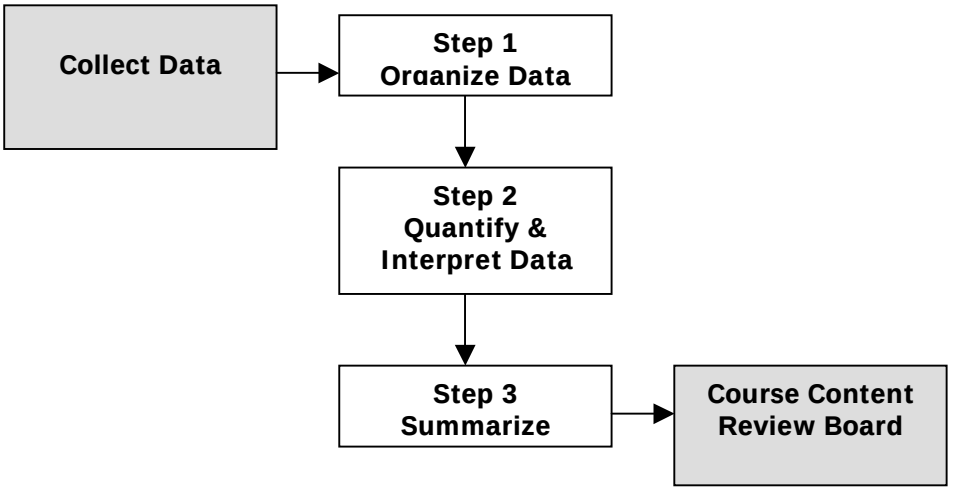


Figure 5-15. Process of Analyzing and Interpreting Data

5301. ORGANIZE DATA

Data must be compiled and organized before it can be analyzed and interpreted. The focus of the evaluation will guide what data should be compiled. Data needs to be organized by topic. The organization of the data will depend upon the questions that need to be answered. For example, an evaluator might organize data into topics of "Course Data," "Instructor Data," "Student Performance Data," etc. Figure 5-16 at the end of Section 5200 identifies the instruments that provide information for each of the categories. Organizing the compiled data into topic areas further isolates data pertaining to the questions that need to be answered. Data is also organized so that categories can be established for data comparison.

ESTABLISH CATEGORIES FOR DATA COMPARISON

Determinations must be made regarding what comparisons will need to be made to provide meaning to the data. It is necessary to determine which comparisons will provide results that can reliably identify both strong and weak areas within the training program. Evaluators should compare data from several different sources. Categories are established for data comparisons so that these comparisons can be made when interpreting data. Such comparisons will minimize decisions being made based upon one data source. Some examples of possible comparisons that can be made are in Figure 5-16.

Figure 5-16. Examples of Possible Comparisons.

Examples of Possible Comparisons
1. Percent of students accomplishing an objective with a previously established standard or with performance of previous classes on the same objective.
2. Job performance data with class performance data.
3. Job performance before and after attending instruction.
4. The frequency of responses on different Instructional Rating Form (IRF) items, on different test items, or within multiple-choice items.
5. Student opinions about the course with their test performance.
6. Student comments about the course with those of the school staff.
7. Final test scores.
8. Number of remedial instruction sessions per iteration of the course over a period of a year or more.

5302. QUANTIFY AND INTERPRET DATA

Quantifying data is systematically assigning numbers to data allowing statistical analysis to be performed so that trends and relationships can be identified and interpreted. Through quantifying the data, the interpretation of data is possible. For test items, item analysis is used to quantify data so that defective test items are identified. Another way that data is quantified and interpreted is through descriptive statistics. Some of the data may need to be coded prior to performing statistics. In these cases, it is important to understand the scales of measurement: nominal, ordinal, interval, and ratio. The scales of measurement provide an understanding of what statistical procedures can be performed for different types of instruments. Item analysis, descriptive statistics, and assigned numbers allow the evaluator to pinpoint trends. Trends can be defined as a pattern or prevailing theme. These trends can reveal strengths and weaknesses within the instructional program. Interpreting data also involves analyzing the test results for validity and reliability. This section will discuss what an evaluator is looking for in the test results to find out if the test is valid and reliable. The use of computer programs can make the process of data interpretation an easier task. Data must be interpreted to identify the problems so that recommendations can be made and solutions generated.

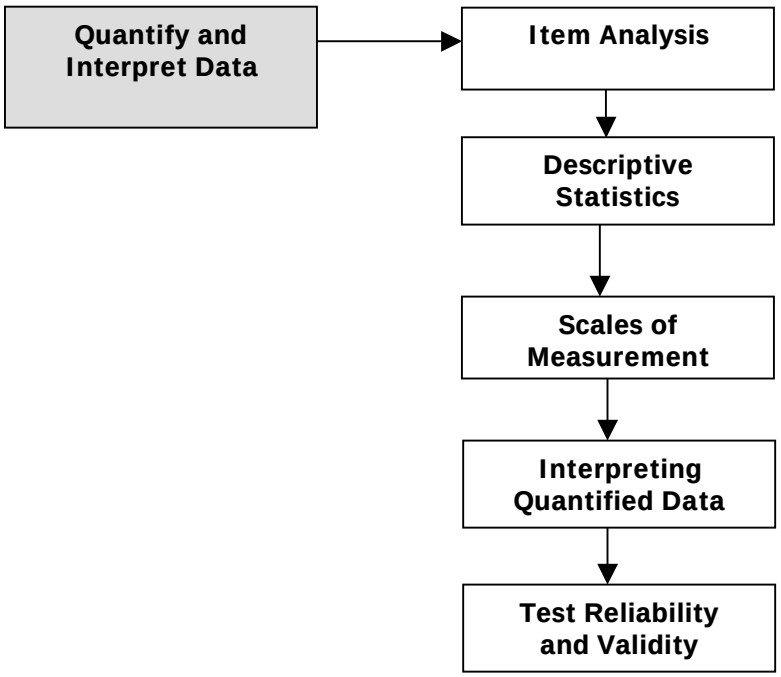


Figure 5-17. Quantify and Interpret Data.

1. Item Analysis Item analysis provides information about the reliability and validity of test items. Reliability and validity are discussed later in this section. There are two purposes for doing an item analysis. First, the analysis identifies defective test items. Secondly, it indicates areas where learners have not mastered the learning objective(s). Through item analysis, trends are identified as far as which test items are problematic. An example of one way to determine item difficulty and item discrimination can be found in Figure 5-18.

a. **Item Difficulty** The frequency of students who answered an item correctly determines the level of difficulty. For example, if 45 of 50 students answer an item correctly, then the level of difficulty is low (.90) since 90 percent were able to answer correctly. However, if 10 out of 50 students answer correctly, then the level of difficulty is high (.20). The Individual Response Report in MCAIMS provides the number and percentage of students who answered each item correctly. This makes it easy to determine the level of difficulty of an item through percentages. The difficulty index is calculated below.

Difficulty Index (*p*). Proportion of students who answered item correctly.

$$p = \frac{\text{Number of students selecting correct answer}}{\text{Total number of students attempting the test item}}$$

$$p = \frac{45}{50} = .90$$

When Difficulty Index (*p* level) is less than about .25, the item is considered relatively difficult. When Difficulty Index (*p* level) is above .75, the item is considered relatively easy. Test construction experts try to build tests with an **average** *p* level (difficulty) of about .50 for the test.

b. **Item Discrimination** A percentage of high-test scorers (U) are compared to a percentage of low-test scorers (L) to determine how both groups of test scorers performed on the same item. To perform item discrimination, a percentage of high-test scorers and low-test scorers must be designated. (Example: Compare the top 10% test scorers to the bottom 10% test scorers who answered the test item correctly.) If a high percentage from both groups missed the item, then more extensive evaluation of the test item and/or instructional process is needed.

Item Discrimination Index (D) Measure of the extent to which a test item discriminates or differentiates between students who perform well on the overall test and those who do not perform well on the overall test.

$$D = \frac{(\text{Number who got item correct in upper group}) - (\text{Number with item correct in lower group})}{\text{Number of students in either group}}$$

Some experts insist that D should be at least .30, while others believe that as long as D has a positive value, the item's discrimination ability is adequate.

There are three types of discrimination indexes:

1) **Positive discrimination index** - those who did well (U) on the overall test chose the correct answer for a particular item more often than those who did poorly (L) on the overall test.
2) **Negative discrimination index** - those who did poorly (L) on the overall test chose the correct answer for a particular item than those who did well (U) on the overall test.
3) **Zero discrimination index** - those who did well (U) and those who did poorly (L) on the overall test choose the correct answer for a particular item with equal frequency.

Item	U (10 stu)	M (10 stu)	L (10 stu)	Difficulty (U + M + L)	Discrimination (U-L)
1	7	4	3	14	4
2	10	10	9	29	1
3	8	6	4	18	4
4	4	4	6	14	-2
5	6	7	6	19	0
6	8	7	4	19	4
7	3	0	0	3	3
8	10	7	5	22	5
9	1	2	8	11	-7
10	8	5	3	16	5

Figure 5-18. Item Analysis: Number of Learners Giving Correct Response in Each Criterion Group.

The table above shows a simple analysis using a percentage of 33 percent to divide a class into three groups – Upper (U), Middle (M), and Lower (L). For instance, if you have a class of 30 students, then the students would be divided by test scores into the following groups: 10 (U) students (33 percent), 10 (M) students (33 percent), and 10 (L) students (33 percent).

Using the above table, a measure of item difficulty is obtained by adding Upper (U) + Middle (M) + Lower (L). The difficulty index for item 2 is found by dividing 29 by 30 equaling .97 (97% of students answered correctly). Either the material is covered extremely well in the class or the question does not have convincing distracters. MCAIMS' Individual Response Report provides a look at the distracters and is discussed in the next section. On item 7, 3 students answered the question correctly. This is an indicator that the material has not been covered adequately, the test question is poorly written, or answer is miskeyed.

A rough index (ratio) of the discriminative value (Upper test scorers compared to the Lower test scorers) of each item can be provided by subtracting the number of individuals answering an item correctly in the Lower (L) group from the number of individuals answering an item correctly in the Upper (U) group (Ex: U-L). Negative numbers indicate that there were more students from the Upper (U) group who missed the question. Positive numbers indicate that more students in the Lower (L) group missed the item. Zero indicates that there was no difference between the Upper (U) group and the Lower (L) group.

2. Descriptive Statistics

a. **Frequency of Collection** Descriptive statistics should be calculated every time a test, questionnaire, survey, etc., is administered. Even if these data are not used immediately to summarize results in a report or to provide feedback to respondents, these data can be useful for future analysis to identify trends or relationships among groups.

b. **Types of Descriptive Statistics** This section presents information and detail concerning descriptive statistics.

1) **Frequency** Frequencies are determined by counting the number of occurrences. As example in Figure 5-20, the score 75 has a frequency of 3 because it occurs 3 times. Frequency counts are used to describe data (e.g., responses, scores, factors, variables) in raw numbers. Arranging variables into a frequency distribution makes the description of the variables easier than it would be if the scores were just listed in order. To illustrate, Figure 5-20 presents ten scores on a test and the same ten scores listed in a frequency distribution below.

2) **Uses** Frequency counts are useful for counting the number of students who took a particular test, the number of students who passed a particular test, the number of students who selected answer A on item 13 of a test, the number of people who responded to a survey questionnaire, the number of people who rated an instructional program as effective, etc.

Figure 5-20. Frequency Distribution.

FREQUENCY

Test Scores: 75, 75, 85, 90, 60, 65, 65, 75, 100, 85

Frequency Distribution

Score	Frequency
100	1
90	1
85	2
75	3
65	2
60	1

3) **Appropriate Scale of Measurement** Frequency counts can be performed on data represented by nominal, ordinal, interval, and ratio scales (Scales of Measurement will discussed in detail later in this section).

a. **Graphic Representation** Frequency distribution data can be readily interpreted by the use of graphs.

1) The simplest graph, known as a frequency polygon, involves representing the frequency count (expressed in raw numbers or by percent) on the Y-axis (vertical). Test scores should be divided into equal intervals and plotted on the X-axis (horizontal). Using the data in Figure 5-20 and grouping the test scores in three intervals, Figure 5-21 displays the frequency distribution in graphic form. A frequency polygon is useful for displaying data within a group or data across groups. An example of data within a group is student scores on a test. Subsequent class scores can be plotted on the same graph to display data across groups.

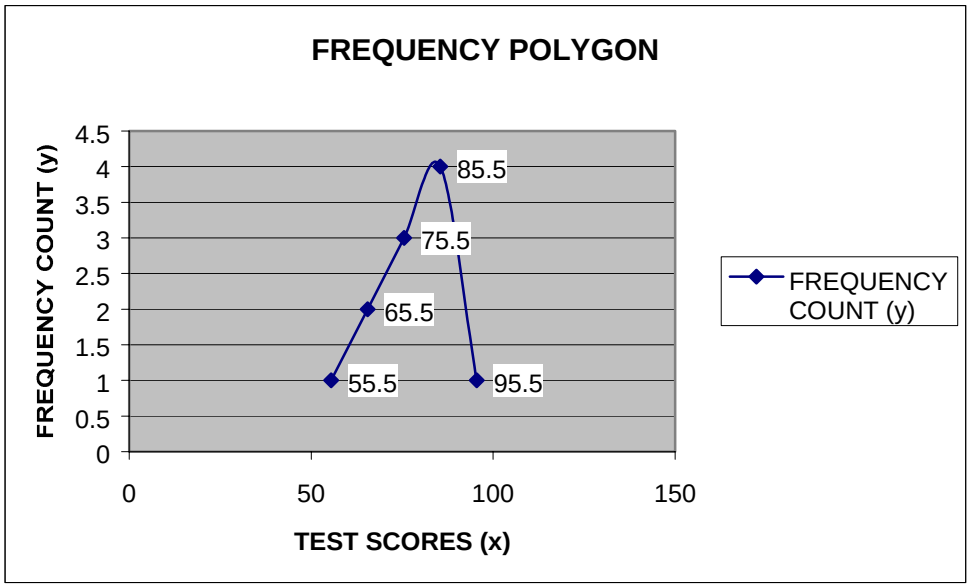
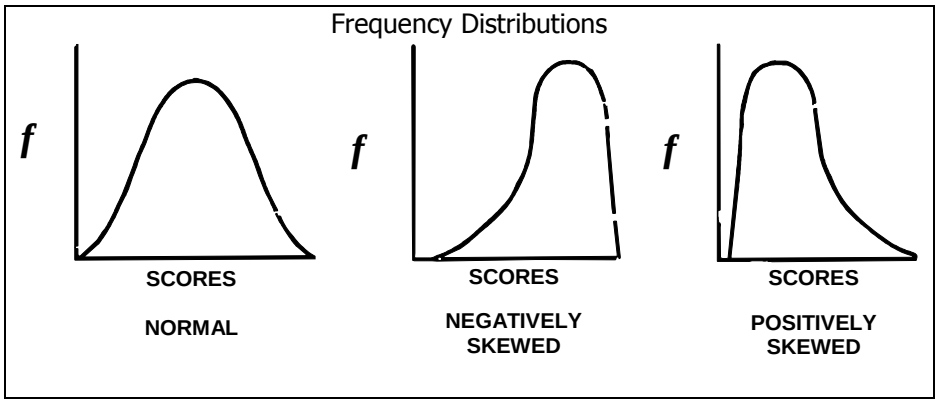


Figure 5-21. Frequency Polygon.

2) Figure 5-22 presents different frequency distributions in graphic form. A frequency distribution is said to be "normal" when it represents a bell-shaped curve. It is important to graph data to see if it is "normal" before performing any statistical analyses. A frequency distribution in which scores trail off at either the high end or the low end of the spectrum is said to be skewed. Where these scores trail off is referred to as the "tail" of the distribution. If the tail of the distribution extends toward the low or negative end of the scale, the distribution is considered negatively skewed; if the tail extends toward the high or positive end of the scale, the distribution is positively skewed.

Figure 5-22. Frequency Distributions.



b. **Measures of Central Tendency** While frequency distributions typically represent a breakdown of individual scores or variables among many, it is often useful to characterize a group as a whole. Measures of central tendency are measures of the location of the middle or the center of a distribution. The definition of "middle" or "center" is purposely left somewhat vague so that the term "central tendency" can refer to a wide variety of measures. Three measures of central tendency are the mode, median, mean. The mean is the most commonly used measure of central tendency. Figure 5-23 provides a description and sample of how to determine each.

Figure 5-23. Measures of Central Tendency.

Measures of Central Tendency	
Mode	The mode is the most frequently occurring response or score. **Sample Test Scores:** 52, 78, 85, 88, 90, 93, 93, 100 **Mode = 93** **NOTE:** More than one mode can exist in a set of data.
Median	The median is the score above and below which 50 percent of the scores in the sample fall. It is sometimes referred to as the "breaking point." 1. Place numbers in order from least to greatest. 2. If number of scores is odd, then the median is the central number or midpoint. 3. If number of scores is even, then add the two middle scores and divide by two. **Sample Test Scores:** 52, 78, 85, 88, 90, 93, 93, 100 88+90=178/2=89 **Median = 89**
Mean	Mean is the "average" score. **Sample Test Scores:** 52, 78, 85, 88, 90, 93, 93, 100 52+78+85+88+90+93+93+100 = 679/8 = 84.875 **Mean = 84.875**

Figure 5-24 provides the scales of measurement (to be discussed next), the data types (i.e., test items, questionnaires), and how the measures of central tendency can be used for each.

1) **Mode** As the most frequently occurring response, mode is simple to compute. The mode is not affected by extreme values. However, it is usually not very descriptive of the data so it is important that other measures of central tendency are used to describe the data.

   a) Mode is useful for determining what most students score on a given test or test item.

   b) Mode is particularly useful for determining what response most students select in a multiple-choice test item, thereby allowing analysis of the item's ability to clearly discriminate between correct and incorrect responses (a good multiple-choice test item has a clear "correct" response and several plausible distracters).

2) **Median** Median is useful for splitting a group into halves. The median is the middle of a distribution; half the scores are above the median and half are below the median. The median is less sensitive to extreme scores than the mean and this makes it a better measure than the mean for highly skewed distributions. For example, the median income is usually more informative than the mean income.

   a) The median is not affected by extreme values and it always exists.

   b) Though median is easy to compute, the numbers must be properly ordered to compute the correct median.

3) **Mean** Mean is the "average."

   a) Mean is calculated to produce an average response per test item across a class or to produce an average response per respondent.

   b) Mean is also useful for determining overall attitudes toward a topic when using a Likert rating scale. For example, using a five-response Likert scale, a student rates the overall effectiveness of a course by answering 20 questions concerning course content, instructor performance, use of media, etc. The value circled for each response can then be summed for a total score. This score is then divided by the number of questions (20) to come up with the mean. In this case, the mean is a total rating of course effectiveness.

c) Mean is generally the preferred measure of central tendency because it is the most consistent or stable measure from sample to sample. The mean is good measure of central tendency for roughly symmetric distributions but can be misleading in skewed distributions since it can be greatly influenced by extreme scores. For example, ten students score the following: 20, 86, 88, 94, 92, 90, 40, 88, 76, 83. Although the mean is 76, it hardly reflects the typical score in the set. Mode or median may be more representative of that group's performance as a whole. When the distribution of scores is widely dispersed, median is the most appropriate measure of central tendency. For example, if five students achieved test scores of 60, 65, 70, 72, and 74, and three students achieved scores of 90, 95, and 100, the overall class score should be reported as a median score. Since the scores achieved by the second group of students are much higher than those of the first group, calculating a mean score would inflate the value of the scores achieved by the lower scoring group. In this example, the mean score is 78, while the median score is 73. When a distribution is extremely skewed, it is recommended that all three measures be reported and the data be interpreted based on the direction and amount of skew.

Figure 5-24. Type of Data Measured By Central Tendency.

Measure of Central Tendency	Measurement Scale	Instrument Type	Type of Data Measured
Mode	Nominal Scale	Student Data Test Data Questionnaires Interview	Most frequent score Most frequent answer
Median	Ordinal Scale Interval Scale Ratio Scale	Test Data	Useful for splitting groups in halves i.e. Mastery and Non-Mastery
Mean	Ordinal Scale	Test Data Questionnaires Interview	Avg. response per test item Avg. response per respondent Overall attitudes toward topic/total rating of course effectiveness
	Interval Scale Ratio Scale	Test Data Questionnaires Interview	Allows comparisons of individuals to overall class mean (test scores, responses to particular items)

c. **Variability** The variability of a set of scores is the typical degree of spread among the scores. Range, variance, and standard deviation are used to report variability.

1) **Range** Range is the difference between the highest and the lowest scores in the set. Range is typically not the best measure of variability because it is dependent upon the spread in a set of scores, which can vary widely. For example, 10 students take a test and score as follows: 100, 92, 94, 94, 96, 100, 90, 93, 97, and 62. The range of scores varies from 100 to 62 so the range is 38 (100-62 = 38). If the lowest score were dropped, the range would be 10 (100-90 = 10), which more accurately reflects the sample. Range serves as a rough index to variability and can be useful to report when the mean of a set of scores is not really representative due to a wide ranging of scores.

2) **Variance** Variance is a more widely accepted measure of variability because it measures the average squared distance of the scores from the mean of the set in which they appear. An example of how to determine variance from a population is shown in Figure 5-25. The variance (136) is the average of the squared deviation of the scores and is used to calculate standard deviation, which is the most widely accepted measure of variability.

Student Scores (X)	**X-Mean**	**$(X\text{-Mean})^2$**
100	100-88 = 12	144
90	90-88 = 2	4
70	70-88 = -18	324
80	80-88 = -8	64
100	100-88 = 12	144
440		680

Number of Scores = 5

Mean = $\frac{X}{\text{Number of Scores}} = \frac{440}{5} = 88$

Variance = $\frac{(X\text{-Mean})^2}{\text{Number of Scores}} = \frac{680}{5} = 136$

Standard Deviation = $\sqrt{136} = 11.7$

Figure 5-25. Variance and Standard Deviation of Test Scores.

3) **Standard Deviation** Standard deviation is the square root of the variance for a set of variables. Standard deviation can reflect the amount of variability among a set of variables, responses, characteristics, scores, etc. In Figure 5-25, the variance score is 136. When the square root of 136 is taken, the standard deviation is 11.7. This means that the average distance of the students' scores from the class mean is 11.7. As another example, the mean score on a test is 70 with a standard deviation of 10. Thus, the average amount students deviated from the mean score of 70 is 10 points. If student A scored a 90 on the test, 20 points above the mean score, we interpret this as a very good score, deviating from the norm twice as much as the average student. This is often referred to as deviating from the mean by 2 standard deviation (SD) units (z score or standard score). If student B scored a 30 on the test, 40 points below the mean score, we interpret this as a very bad score, deviating from the norm four times as much as the average student.

3. Scales Of Measurement Scales of measurement specify how the numbers assigned to variables relate to what is being evaluated or measured. It tells whether a number is a label (nominal), a ranking order (ordinal), represented in equal intervals (interval), or describing a relationship between two variables (ratio). The type of measurement scale used affects the way data is statistically analyzed. Scales of measurement represent the varying degree of a particular variable. Figure 5-30 provides the types of statistical analysis that can be performed for different instruments using the scales. Sample questions illustrating the use of the following scales can be found in Section 5603, Design Evaluation Instruments.

a. **Nominal Scale** A nominal scale measurement is simply a classification system. For instance, observation data can be labeled and categorized into mutually exclusive categories. Nominal numbering involves arbitrarily assigning labels to whatever is being measured. Assigning a 1 to a "yes" response and a 0 to a "no" response is an example of nominal numbering; so is assigning a 1 to "male" respondents and a 0 to "female" respondents. Quantification of data by nominal numbering should be done only when an arbitrary number is needed to distinguish between groups, responses, etc. Characteristics of a nominal scale are listed in Figure 5-26.

Characteristics of a Nominal Scale

1. Characterized by a lack of degree of magnitude. In other words, assigning a 1 to a variable does not mean that it is of a greater value than a variable assigned a 0. Using the example below, answering "yes" is not of greater value than answering "no." The numbers serve only to distinguish among different responses or different characteristics.
    a. YES = 1
        i. NO = 0

2. Does not reflect equal intervals between assigned numbers. For example, the numbers distinguishing the military branches are just data labels.
    a. Air Force = 1
    b. Army = 2
    c. Navy = 3
    d. Marine Corps = 4

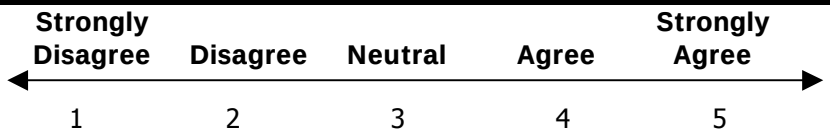
3. Does not have a true zero; because a variable is assigned a 0 does not mean that it lacks the property being measured. Using the example below, assigning the number "0" to those who answered female on a student data sheet does not mean that the participant lacks gender.
    a. MALE = 1
    b. FEMALE = 0

Figure 5-26. Characteristics of a Nominal Scale.

b. **Ordinal Scale** The ordinal scale permits a "ranking" between values. Differences cannot be "quantified" between two ordinal values. A Likert scale is an example of an ordinal scale. For example, rating the effectiveness of instruction from 1 (ineffective) to 5 (very effective) permits comparisons to be made regarding the level of effectiveness; a larger number indicates more of the property being measured. Characteristics of an ordinal scale are listed in Figure 5-27.

Figure 5-27. Characteristics of Ordinal Scale.

Characteristics of an Ordinal Scale



1. Degree of magnitude exists in ordinal numbers because each higher rating indicates more of the property being measured. Above, the level of agreement is being measured. A 5 indicates a higher level of agreement than a 2.

2. Equal intervals do not exist between ordinal numbers. For example, a rating of a 4 in the above example is not twice as effective as a rating of 2. Numbers used in an ordinal scale should not be added or multiplied because this can produce misleading results [i.e., two ratings of 2 (disagree) do not equal a single rating of 4 (agree). A 4 means something totally different than a 2.

3. There is no true zero in an ordinal scale. In the above example, it is meaningless to assign a 0 to a variable to indicate a lack of effectiveness because a rating of 1 indicates "ineffective."

c. **Interval Scale** Interval numbering allows comparisons about the extent of differences between variables. For example, on test X, student A scored 20 points higher than student B. An example of an interval numbering system is a response to a question asking the respondent's age, the number of years in grade, etc. Characteristics of an interval scale are listed in Figure 5-28. This will help the evaluator determine when to quantify data using an interval scale.

Figure 5-30. Characteristics of Interval Scale.

Characteristics of an Interval Scale

1. Degree of magnitude exists in interval numbers because each higher rating indicates more of the property being measured. For example, a score of 95 is better than a score of 90 on a test.

2. Equal intervals exist between interval numbers. For example, 30 years in service is 10 more years than 20 years in service, which is 10 more years than 10 years in service.

3. There is no true zero in an interval scale. Temperature is an example because temperatures can dip below 0 degrees and a temperature of 0 degrees does not indicate an absence of temperature.

d. **Ratio Scale** A ratio scale has equal intervals and a meaningful zero point. Point values assigned to responses to score a test is an example of a ratio scale. Ratio numbering permits precise relationships among variables to be made. For example, student A received a score of 40 on the test, which is twice as good as student B's score of 20. Characteristics of a ratio scale are listed in Figure 5-31. This will help the evaluator determine when to quantify data using a ratio scale.

Characteristics of a Ratio Scale

1. Degree of magnitude exists in a ratio numbering scale. Test scores are an example of a ratio scale illustrating degree of magnitude (e.g., a score of 80 is better than a score of 70).

2. Equal intervals exist on a ratio numbering scale (e.g., a score of 90 is twice as good as a score of 45).

3. A true zero exists in a ratio numbering scale (e.g., a score of 0 indicates no score). A ratio numbering system is typically used to quantify pass/fail data on a performance checklist, with "pass" quantified by a 1 and "fail" quantified by a 0.

Figure 5-31. Characteristics of a Ratio Scale.

GUIDE TO QUANTIFYING DATA TO PERMIT STATISTICAL ANALYSIS

The following is presented to aid the evaluator in quantifying data and selecting appropriate statistical analyses based on the evaluation instrument being used (see Figure 5-30).

See Figure 5-30 on the next page.

GUIDELINES FOR QUANTIFYING DATA TO PERMIT STATISTICAL ANALYSIS				
Evaluation Instrument	**Scale of Measurement**	**Examples of Qualifying Data**	**Statistical Analyses That Can Be Performed**	**Statistical Analyses That Cannot Be Performed**
Multiple-choice Test Item	**Nominal**	A = 1, B = 2, C = 3, D = 4, etc.	Frequency counts of responses per test item Mode (most frequently selected responses per test item) Item Analysis (when used in conjunction with a ratio scale)	Mean (average response per test item or per student) Median Overall test score per student Variability (range, variance, standard deviation)
	Ratio	**Point system:** 1 = correct answer 0 = incorrect answer	Frequency counts for correct/incorrect responses ☑ Per test item ☑ Per student Mean (calculated to produce item difficulty) Median (score for overall test which splits class in half) Item analysis (but cannot determine where problem lie) Overall test score per student Variability of overall test scores	Frequency counts for all incorrect responses (distracters) Mean (average response per test item or per student) Mode (most frequently selected response per test item) Variability of responses per test item
True/False Test Item	**Ratio**	**Point system:** 1 = correct answer 0 = incorrect answer	Frequency counts for correct/incorrect responses ☑ Per test item ☑ Per student Mean (calculated to produce item difficulty) Median (score for overall test which splits class in half) Item analysis Overall test score per student Variability of overall test scores	Mean (average response per test item or student) Mode (most frequently selected response per test item)
Fill-in-the-blank Short-Answer Test Item	**Ratio**	**Point system:** Points for correct response and partial credit	Frequency counts of responses ☑ Per test item ☑ Per student Mean score per test item and per student Mode (most frequently scored points per test item) Median (score for overall test which splits class in half) Preliminary item analysis Overall test score per student Variability of overall test scores and points scored per test item	

Figure 5-30. Guidelines for Quantifying Data to Permit Statistical Analysis.

GUIDELINES FOR QUANTIFYING DATA TO PERMIT STATISTICAL ANALYSIS (cont.)

Evaluation Instrument	Scale of Measurement	Examples of Qualifying Data	Statistical Analyses That Can Be Performed	Statistical Analyses That Cannot Be Performed
Fill-in-the-blank/ Short-Answer Test Item (cont.)	Ratio (cont.)	Point system: 1=correct answer 0=incorrect answer	Frequency counts of correct/incorrect responses ☑ Per student ☑ Per test item Mean (calculated to produce item difficulty) Median Preliminary item analysis Overall test score per student Variability of overall test scores	Frequency counts for all incorrect responses Mean (average response per test item or per student) Mode (most frequent response per test item) Variability of responses per test item
	Nominal	Categorize responses and assign a number to each response	Frequency counts of all responses per test item Mode (most frequently occurring response) Item analysis	Mean (average response per test item or per student) Median Overall test score per student Variability of responses per test item
Performance-Based Test Item	Ratio	Point system: 1=pass 0=fail	Frequency counts of pass/fail ☑ Per student ☑ Per test item Mean (calculated to produce item difficulty) Median Preliminary item analysis Overall test score per student Variability of overall test scores	Mean (average response per test item or per student) Mode (most frequent response per test item) Variability of outcomes per test item

Figure 5-30. Guidelines for Quantifying Data to Permit Statistical Analysis (cont.).

GUIDELINES FOR QUANTIFYING DATA TO PERMIT STATISTICAL ANALYSIS (cont.)

Evaluation Instrument	Scale of Measurement	Examples of Qualifying Data	Statistical Analyses That Can Be Performed	Statistical Analyses That Cannot Be Performed
Interview/ Survey Questionnaire	Nominal	Categorize responses and assign a number to each response	Frequency counts of responses per item Mode (most frequently occurring response) Variability of responses per item	Frequency counts per student Mean response per item and per student Median
	Ordinal	Likert scale	Frequency counts of responses per item Mean response per item Mean response per student (assuming scale is same throughout survey) Median (response per item which splits respondent groupin half) Mode (most frequently occurring response per item) Variability of responses per item	
	Interval	Response serves as the code when response is numerical (e.g., age, years in service)	Frequency counts of responses per item Mean response per item Median (response per item which splits respondent group in half) Mode (most frequently occurring response) Variability of responses per item	Mean response per student

Figure 5-30. Guidelines for Quantifying Data to Permit Statistical Analysis (cont.).

4. Interpreting Quantified Data

a. **Multiple-Choice Test Item** Both nominal and ratio scales can be used for multiple-choice test items. Using these scales to analyze multiple-choice test items is explained below.

1) **Nominal Scale** Labels are assigned to different responses. For example, in a 4-choice item, answer "a" is coded as 1, answer "b" as 2, answer "c" as 3, and answer "d" as 4.

a) A nominal scale permits frequency counts, mode, and item analysis of individual test items to be performed. Figure 5-34 presents data from three students who took the same 10-item test and their responses to each question. Next to each response is the number assigned to categorize the response (an asterisk indicates an incorrect response). Nominal numbers can be added across test items to calculate frequency counts (e.g., two out of three students selected response "a" on test item 1; all three students selected response "b" on test item 2). Mode can be determined for an item by looking for the most frequently occurring response an item (e.g., the mode for test item 1 is "a").

Figure 5-31. Student Test Data.

Test Item	Student #1	Student #2	Student #3
1.	a 1	*d 4	a 1
2.	b 2	b 2	b 2
3.	*a 1	*d 4	*b 2
4.	c 3	c 3	*a 1
5.	d 4	d 4	d 4
6.	a 1	a 1	a 1
7.	b 2	*d 4	b 2
8.	d 4	*a 1	d 4
9.	c 3	c 3	c 3
10.	d 4	d 4	d 4

b) Nominal numbers cannot be summed to provide an overall score on the test for each student because a nominal scale only assigns labels to responses and does not reflect degree of magnitude (a higher score does not reflect a better score). In Figure 5-31, it would be incorrect to sum the coded responses to provide an overall score of 25 for student #1, 30 for student #2, and 24 for student #3. In actuality, student #1 performed the best with only 1 incorrect answer, student #3 performed second best with two incorrect answers, and student #2 had four incorrect answers.

c) A nominal scale cannot be used to calculate mean, median, or variability (range, variance, and standard deviation) because these data are meaningless in this context. For example, in Figure 5-34, a calculated mean or average response to test item #1 [(1 + 4 + 1) divided by 3 = 2] is meaningless because it would reflect that the average response to item #1 is "b." It would also be incorrect to calculate a mean by, for example, adding student #1's scores for each item and dividing by the number of items (25 divided by 10) to produce a mean response of 2.5. To interpret this would mean that the average response is halfway between a response of "b" and a response of "c," which is a meaningless calculation.

2) **Ratio Scale** A ratio scale can be used in conjunction with a nominal scale when quantifying responses to multiple-choice test items or it may be used as the only means of quantifying the data.

a) If an evaluator is solely interested in how many questions a student answers correctly, a simple scoring system is needed to count the number of correct and incorrect responses so a total score for the test can be calculated for each student. To do this, multiple-choice test items can be quantified using a ratio scale (e.g., 1 point is given to each correct answer and a 0 is given to each incorrect answer). This numbering system permits some frequency count data to be gathered (e.g., 22 of 50 students answered test item #1 correctly), but it does not permit frequency counts to be made across responses. This is because every incorrect response is assigned a 0, making it impossible to discern how many students selected any response other than the correct response. This numbering system permits preliminary item analysis to be performed (e.g., determining the percentage of students who got the answer right and those who did not), but it does not permit further item analysis to determine the item difficulty level of each response.

b) The evaluator can code the data using a ratio scale by assigning point values for correct responses and no points for an incorrect response. This allows the calculation of an overall test score per student by summing the point values for each question. A median (i.e., score for overall test which splits the class in half) can also be calculated, as can the variability of overall test scores.

c) A ratio scale can also enable the calculation of mean to produce item difficulty rating. When responses are quantified with either of two numbers (e.g., 0 and 1), the evaluator can sum the responses to get a frequency count. The frequency counts relate to the number of correct and incorrect answers. The frequency count is then used to calculate item difficulty. Item difficulty is calculated by dividing the number of students who got the item correct by the total number of students taking the test. Therefore, if 20 students answered a test item correctly and five answered incorrectly, the item difficulty would be .80.

$$\frac{\text{\# of Students Who Answered Correctly}}{\text{\# of Students Taking the Test}} = \frac{20}{25} = .80$$

d) Quantifying data using a ratio scale does not, however, permit calculation of a mean response per student or per test item. Variability is not calculated for the same reason.

e) Mode (i.e., most frequently selected response per test item) is not calculated when using a ratio scale on a multiple-choice test item. This is because test data are coded as incorrect or correct rather than labeling all of the responses as is done with a nominal scale.

b. **True/False Test Items** A true/false test item is typically quantified using a ratio scale (1 point for a correct response 0 points for an incorrect response). This allows frequency counts, mean (calculated to produce item difficulty), median (overall test score that splits the class in half), an overall test score per student, and variability of overall tests scores to be calculated. However, a mean response per test item or per student and a mode cannot be calculated because the actual response of "true" or "false" is not quantified; the correctness of the answer is.

c. **Fill-in-the-Blank and Short-Answer Test Items** Fill-in-the-blank and short-answer test items can be quantified using a ratio scale and a nominal scale.

1) One method for quantifying this type of data is to devise a scoring system so that answers are given points based on the "correctness" of the response. This is typically done by creating an answer key that details the levels of acceptable responses to each question. For instance, a test question may require the student to list, in order, the seven essential qualities of leadership. The answer key may be established so that the student receives 1 point for each correct quality listed and another 3 points if they are listed in correct order. This creates a scale of measurement that ranks performance on each item by the response's level of correctness. This is a good scale of measurement if there is some flexibility in the answers so that partial credit may be given to some information.

a) This type of scoring system permits frequency counts of responses per test item and per student, a mean score per test item, a mode (most frequently scored points) per test item, a median test score that splits the class in half, preliminary item analysis, an overall test score per student, the variability (range, variance, and standard deviation) of overall test scores, and the variability in the point spread among students per their overall test scores and per test item.

b) Item difficulty and item discriminability may be calculated per test item to determine the percentage of students who answered correctly and the percentage who did not. However, an analysis of responses to determine if students responded incorrectly, but in similar ways, cannot be performed. For instance, it may be useful to know that students who missed a particular test question all responded with the same "wrong" answer. These data would help determine if the question was worded poorly so that it may be reworded in the future to remove any uncertainty or misinterpretation of its meaning. This can only be accomplished through use of a nominal scale.

2) Another ratio scale involves establishing a scale of measurement with equal intervals and a true zero. Unlike the previous example where each response is keyed to a point system that may or may not be the same for each response, this method uses a point system that is the same for all responses. Such a system may be as simple as assigning a 1 to a correct response and a 0 to an incorrect response. This scale of measurement is only useful if there is a clearly defined correct and incorrect response for the item. This scoring system permits the same statistical analyses to be performed that a ratio scale for a multiple-choice test item permits.

3) Fill-in-the-blank and short-answer test items can also be quantified using a nominal scale, although this can be time consuming. To quantify data using a nominal scale, the responses must first be categorized into same or like responses. This can be difficult if the responses in the group vary greatly. If the responses can be categorized, the data are then quantified by assigning a number to each category through use of a nominal scale. Frequency counts, mode, and item analysis can be calculated. Mean (i.e., average response per test item or per student), median, an overall test score per student, and variability cannot be calculated.

d. **Performance-Based Test Items** Performance-based test items are typically pass/fail items quantified as either a 1 (pass) or a 0 (fail). This scoring system permits the same statistical analyses to be performed that a ratio scale for a multiple-choice test item permits.

e. **Interview Data/Survey Questionnaires** Interview data and survey questionnaires are structured to collect data through fill-in-the-blank/short-answer questions, multiple-choice items, and Likert rating scales.

1) **Nominal**

a) **Fill-in-the-Blank/Short-Answer Response** Survey and interview data of this nature can be difficult to quantify because they require a subjective judgment by the evaluator to categorize responses into meaningful groups of like responses. Unlike test data, survey and interview data are not quantified by "points" that can be added up for a total score but, rather, by using numbers to assign labels to responses (nominal scale). The difficulty lies in grouping the responses because an open-ended question can produce a multitude of different responses. For example, Figure 5-32 presents an open-ended question. Just below the question are the categories of responses identified during analysis of the test. The responses should be categorized into the smallest number of groups possible. In this example, all responses were easily categorized into one of five groups and quantified accordingly. Care should be taken when constructing a survey questionnaire to minimize fill-in-the-blank/short-answer items so the data can be easily quantified and analyzed (see Section 5603). In this example, the question was better suited to be a multiple-choice item that could have been quantified readily by allowing respondents to select their responses.

Figure 5-32. Categorizing Responses to an Open-Ended Question.

CATEGORIZING RESPONSES TO AN OPEN-ENDED QUESTION

How often did you receive hands-on training with the equipment while attending the Radio Repairman Course?

_____

Less than once a week	= 1
Once a week	= 2
Twice a week	= 3
Three times a week	= 4
More than three times a week	= 5

b) **Multiple-Choice Response** Survey and interview data that use a multiple-choice response format can be quantified like their counterpart knowledge-based test items using a nominal scale to assign labels to responses.

2) **Ordinal** An ordinal scale is used to measure responses gathered using a Likert rating scale. A Likert rating scale is the primary data collection tool that employs an ordinal scale. Typically, responses to a subject are rated across a continuum using a scale that varies from three to seven possible responses. The bottom of the scale typically represents a low amount of the property being measured while the top of the scale typically represents a high amount of the property being measured.

   a) Unlike knowledge- and performance-based test items and other types of survey/interview questions, a Likert rating scale is a measure where the mean (i.e., typical response per item) per respondent is calculated. When using a Likert scale, it is appropriate to add the responses and divide by the number of questions per student to produce a student's overall response or attitude to a subject. For example, a survey evaluating the improvements made to a training program uses a 3-point Likert scale. Respondents answer questions concerning the improvements made with 1 = "not improved," 2 = "improved," and 3 = "greatly improved." In this example, it would be appropriate to calculate a mean response to the survey per student. It would be possible for a student's mean response to be 2.5 which could be interpreted as the training program overall is considered to be improved.

   b) A mean is calculated using a Likert scale only if the same scale is used throughout the survey and the whole survey measures the same topic. For example, half of a survey measures the effectiveness of graduate job performance on a 5-point Likert scale from "ineffective" to "very effective." The other half of the survey measures graduate training in terms of effectiveness by using the same 5-point scale. It would be inappropriate to calculate an average response per respondent to the overall survey when the survey is measuring two different topics.

3) **Interval** Responses to a survey questionnaire or interview that are numerical in nature (e.g., respondent's age, years in service) are quantified using an interval scale. An interval scale quantifies the responses by the value of the response. If a respondent answers 23 to a question asking his age, his response is coded as 23. An interval scale permits the following statistics to be performed on a per item basis only: frequency counts, mean response, mode (most frequently occurring response), median (the response that splits the respondent pool in half), and variability (range, variance, and standard deviation). Unlike a Likert scale that may be the same scale used throughout a survey, an interval scale is not usually the same throughout a survey. A survey is usually designed with interval questions to gather primarily demographic data. Therefore, it is not appropriate to sum responses in an interval scale to calculate the above descriptive statistics for the overall survey.

5. Test Reliability And Validity The reliability and validity of a test provide the foundation for effective evaluation of student performance. Both the reliability and validity of a test should be assessed to identify the appropriateness of the test as an accurate measure of instructional effectiveness.

a. **Reliability** Reliability refers to the ability of an instrument to measure skills and knowledge consistently. The reliability of a test is determined based on the calculation of a reliability coefficient (r). It is recommended that this coefficient be computed using a computer statistical analysis software package. A reliability coefficient is the correlation, or degree of association, between two sets of scores. Correlation coefficients range from -1.0 to +1.0. The closer a coefficient gets to -1.0 or to +1.0, the stronger the relationship. The sign of the coefficient tells whether the relationship is positive or negative.

Coefficient	Strength	Direction
r = - .85	Strong	Negative
r = +.82	Strong	Positive
r = +.22	Weak	Positive
r = +.03	Very Weak	Positive
r = - .42	Moderate	Negative

The different methods of estimating reliability fall within three categories: determining the internal consistency of a test, determining the stability of a test over time, and determining the equivalence of two forms of a test.

1) **Test-Retest** Test-retest is a method of estimating reliability by giving the test twice and comparing the first set of scores and the second set of scores. For example, suppose a test on Naval correspondence is given to six students on Monday and again on the following Monday without any teaching between these times. If the test scores do not fluctuate, then it is concluded that the test is reliable. The problem with test-retest reliability is that there is usually some memory or experience involved the second time the test is taken. Generally, the longer the interval between test administration, the lower the correlation.

Student	First Administration Score	Second Administration Score
1	85	87
2	93	93
3	78	75
4	80	85
5	65	61
6	83	80

2) **Alternate Forms** If there are two equivalent forms of a test, these forms can be used to obtain an estimate of the reliability of the test. Both forms of the test are administered to the same group of students and the correlation between the two sets of scores is determined. If there is a large difference in a student's score on the two forms of the test that are suppose to measures the same behavior, then it indicates that the test is unreliable. To use this method of estimating reliability, two equivalent forms of the test must be available and they must be administered under conditions as nearly equivalent as possible.

3) **Split-Half Method** If the test in question is designed to measure a single basic concept, then the split-half method can be used to determine reliability. To find the split-half (or odd-even) reliability, each item is assigned to one half or the other. Then, the total score for each student on each half is determined and the correlation between the two total scores for both halves is computed. Essentially, one test is used to make two shorter alternate forms. This method has the advantage that only one test administration is required, so memory or practice effects are not issues. This method underestimates what the actual reliability of the full test would be.

b. **Interpreting Reliability**

1) **Scoring reliability limits test reliability** If tests are unreliably scored, then error is introduced that limits the reliability of the test.

2) **The more items included in a test, the higher the test's reliability** When more items are added to a test, the test is better able to sample the student's knowledge or skill that is being measured.

3) **Reliability tends to decrease as tests are too easy or too difficult** Score distributions become similar which makes it tough to know whether the instrument is measuring knowledge and skills consistently. When tests are too difficult, guessing is encouraged which creates a source of error in the test results.

c. **Validity** The term validity refers to how well an instrument measures what it is suppose to measure. Validity can be assessed for tests, questionnaires, interviews, etc. However, validity is most often calculated for tests. Without establishing its validity, a test is of questionable usage since the evaluator does not know for sure whether the test is measuring the concepts it is intended to measure. There are several types of validity that can be determined.

1) **Content Validity** Content validity assesses the relevance of the test items to the subject matter being tested. Content validity is established by examining an instrument to determine whether it provides an adequate representation of the skills and knowledge it is designed to measure. No statistical test is used to establish content validity. To determine whether a test has content validity, SMEs review the test items and make a judgment regarding the validity of each item. For this approach to be effective, two major assumptions must be met. First, the SMEs must have the background and expertise to make a judgment regarding the content of the test. Second, the objectives to which the test is compared must be valid.

2) **Criterion-Related Validity** Criterion-related validity is established when test scores are compared to a criterion (such as graduate performance on the job) to determine how well a test predicts the criterion. For example, the validity of a test on map reading can be determined by comparing the scores students received on the test with their performance on a field exercise in land navigation. The test will have criterion-related validity if a student who received a high score on the map reading test receives a high score on the map reading portion of the land navigation exercise. Criterion-related validity is usually expressed as a correlation. There are two types of criterion-related validity: concurrent and predictive validity.

   a) **Concurrent Validity** To establish the criterion-related validity of a test, it is often faster to test people already considered successful on the criterion (e.g., individuals who were rated highly on their job performance). If successful individuals are used, valuable time is saved since they already have job performance scores ready for comparison with the test scores. If the test correlates highly with the job performance data, then the test has concurrent validity. In other words, if the successful job performers also score highly on the test, then the test is shown to be related to the criterion (successful job performance). The test is able to identify which individuals are doing well in their jobs. Once a test has been determined to possess concurrent validity, predictive validity is often tested or inferred.

   b) **Predictive Validity** Predictive validity refers to how well the test predicts some future behavior of the student. This form of validity is particularly useful for aptitude tests, which attempt to predict how well the test taker will do in some future setting. The predictive validity of a test is determined by administering the test to a group of subjects, then measuring the subjects on whatever the test is supposed to predict after a period of time has elapsed. Often an instructor will want to design a test to try to predict how well students will perform on a criterion. If the test is able to predict the student's scores on the criterion with a good deal of accuracy, then the test has predictive validity. Predictive validity is very useful to instructors. If an instructor is able to predict future performance with a good deal of accuracy, he/she can identify students who need more attention in order to succeed.

d. Using A Computer To Perform Statistical Analysis

Use of computer statistical programs enables an evaluator to perform data analysis quickly and to generate a variety of statistics based on the specific requirements of the evaluation. Statistical analysis is currently not a discipline required of Marine Corps evaluators; however, it can greatly improve the evaluator's ability to analyze and interpret evaluation data by providing the tools to describe and define outcomes, compare relationships, and identify trends. Skill in statistical analysis is generally acquired through training or schooling. However, it can be learned and practiced, particularly if the evaluator has a computer statistical package. Along with learning the computer program, the key to performing statistical analysis on a computer is understanding the different statistical procedures, when to use them, how to use them, and how to interpret their results. Throughout this section, specific statistical analysis procedures have been discussed. Many of these statistics can be calculated by hand (e.g., frequency, mean, mode, median, range, item analysis). However, many of the more complex statistics are time consuming to calculate and leave greater room for human error in their calculation. An easier way to calculate these is through use of a computer statistical program.

1) **Use of Computer Programs** There are many statistical programs that run on standard personal computers. Most of these programs are designed to allow the user to enter data from tests, questionnaires, etc., and select the type of statistics desired. The use of statistical software packages enables the user to perform data analysis quickly and efficiently and generate a variety of statistics based on the specific requirements of the evaluation. One of the most widely available computer programs is SPSS (Statistical Package for the Social Sciences). SPSS is a powerful tool that allows the calculation of all the statistics discussed in this Manual. Additionally, SPSS allows the calculation of several other higher-order statistics too complicated to discuss here.

2) **Automated Instructional Management Systems** The Marine Corps is using the TECOM Integrated Management System (TIMS) to manage students' attendance and performance during courses. The student evaluation module of TIMS can produce reports and statistics. For instance, TIMS can retrieve the class test results, an individual response report, an incorrect response report, an absentee report, and GPA/class standings reports for use by administrators. Within test statistics, TIMS automatically configures the mean, median, mode, and standard deviation. It also provides the number of perfect scores, number tested, number passed, and number failed. Refer to the TIMS help screens for more information and guidance.

5303. SUMMARIZE DATA

After data is assimilated, it should be summarized for ease of interpreting the results. Decisions must be made regarding how the data should be summarized. Data may be summarized in paragraph form and/or a table, graph, chart, or matrix. Strengths and problem areas are identified so that solutions can be formed and recorded.

1. Identify Strengths By identifying and documenting strengths, support is available to prevent changes being made to components of the program that work well.

2. Identify Problem Areas The evaluator should identify any problem areas found during the interpretation of data. It is this step that identifies where changes may be necessary or what areas need to be reviewed for trends. Problem areas should be identified within the summarized data. Descriptive statistics, graphic summarization, and paragraph form are three ways that data can be summarized.

a. **Descriptive Statistics** Descriptive Statistics are ideal for summarizing evaluation results. Descriptive statistics can be used to present evaluation results in paragraph form. Some examples:

1) 80 out of 100 students passed the written exam resulting in a pass rate of 80%.
2) Scores on the test ranged from a low of 65 to a high of 100, with a class mean of 92.5.
3) Students were asked to complete a comprehensive questionnaire rating the effectiveness of the instructional program. Students indicated responses on a scale of 1 to 5, 5 representing extremely effective. The mean value of class responses was 4.1, indicating an overall impression that the instructional program was very effective.
4) Of the 125 graduates surveyed, only 3 felt the instructional program did not prepare them for performance on their current job.

b. **Graphic Summarization of Evaluation Results** Graphs, tables, and charts can be used to summarize evaluation results so that they are easily understand. Many types of data can be easily plotted on bar charts or line graphs to show relationships, indicate trends, or explain results. To provide comprehensive information, the results may need to be explained in paragraph form.

3. Determine Solutions Decisions must be made based upon the interpretation of the data. Any recommended solution should consider future goals and the feasibility of the change within the school. A plan of action should be formed. If revisions can be made to correct the identified problems, they should be made in a timely manner. A Course Content Review Board can be held at any time (not just annually) if major changes are necessary.

4. Record Solutions Evaluation results must always be documented in some form. Evaluation results are used to inform personnel about the findings resulting from the collection, analysis, and interpretation of evaluation information. Once evaluation information is interpreted, there are **three courses of action** that can be taken:

a. All evaluation data are recorded and preserved for future use should no revisions to the course be determined.

b. Evaluation is continued through the collection of additional data by the Formal School/Detachment. The focus of this evaluation is targeted at the suspected deficiency in the instructional program.

c. Revisions to course materials are identified and presented at a CCRB.

SECTION 4

5400. MANAGE EVALUATION DATA

The next step in the evaluation process is to manage the documentation of evaluation results and recommendations for revising or refining an instructional program. These documents and reports are prepared to serve as a historical record of the evaluation, provide an audit trail for the continuing development and improvement of instruction, and direct the activities for implementing changes to the instructional program. Efficient data management. Therefore, requires that the information presented in these documents be clear, concise, and accurate. This chapter provides guidance concerning the documentation of evaluation results.

5401. MARINE CORPS AUTOMATED INSTRUCTIONAL MANAGEMENT SYSTEM (MCAIMS)

A CDD and POI is maintained by each formal school/detachment in MCAIMS for every formal course of instruction. MCAIMS can also track the drops, progress, and absenteeism of students through the use of the Student Module. Once test items/questions for questionnaires are entered into MCAIMS, then the test data/questionnaire data can be scanned or manually entered. Using MCAIMS for Tests/Questionnaires is optional. MCAIMS has the capability to print reports that can be used for statistical analysis for the test/questionnaires entered into the data system. Refer to the MCAIMS User Manual for specific guidance.

5402. DATABASES/SPREADSHEETS

To meet specific school needs in maintaining and managing data, some schools develop databases or spreadsheets to assist in conducting analysis and interpreting data. Specific reports can be generated from databases that compile entered data for easy interpretation. Prior to building such a database, the focus of the evaluation and the development of evaluation instruments should be complete. Formulas can be applied so that the database/spreadsheet will provide statistical data. Users skilled with both MCAIMS and standard spreadsheet or database applications can benefit from MCAIMS' ability to produce Student and Evaluation Data Export files for use in other applications.

5403. COURSE HISTORY FOLDERS

Course history folders are the paper-based version of maintaining data. Schools must maintain course booklets at the schoolhouse for at least five years. The data placed in the course history folders can be paper-based, printed out of databases, MCAIMS, or other computer programs. However, by maintaining a folder for each iteration of a course, all data regarding a particular class can be easily assessed for reviews, inspections, or Course Content Review Boards. The following documentation, at a minimum, should be maintained in course history folders:

1. Enrollment rosters
2. Student data sheet information
3. Test results (i.e., reports, statistics, item analysis)
4. After Instruction Reports
5. End of Course Critique Summary
6. Graduation Roster

5404. RECORD OF PROCEEDINGS

The Record of Proceedings (ROP) is generated from the Course Content Review Board (CCRB). CCRBs are discussed in detail in the next section. An ROP documents evaluation results and recommendations for revising an instructional program identified during the conduct of a CCRB. Within the formal school/detachment, the ROP not only documents an evaluation, it also functions as a record submitted to higher headquarters for implementing changes to an instructional program. If there are no recommended changes, then the ROP is simply maintained for documentation purposes at the formal school/detachment. The ROP also serves to initiate action at higher headquarters to address requirements outside the scope of the formal school. To ensure that changes to instruction are implemented properly and that recommendations for changes outside the scope of the formal school are addressed, the standard ROP format is located in APPENDIX G.

CCRB- Course Content Review Board.

SECTION 5

5500. COURSE CONTENT REVIEW BOARD

MCO 1553.2 mandates that formal schools/detachments convene a Course Content Review Board (CCRB) every three years to ensure the efficiency and effectiveness of an instructional program. However, a CCRB can be more frequent if the need arises. Figure 5-36 provides a Conduct a CCRB Checklist to assist the host in the preparation and conduct of a CCRB.

Examples of When to Conduct CCRB

1. Biennially (every two years) for quality control.
2. When doctrine is updated or new requirements surface.
3. If evaluation results reveal a need to revise some facet of an instructional program, then a CCRB is held.

5501. CCRB FUNCTIONS

A CCRB functions to record information and make recommendations to improve the effectiveness and efficiency of an instructional program. The Record of Proceedings (ROP) must provide justification and recommended courses of action for implementing any revisions to the instructional program. All recommended lesson and/or course revisions must be reflected in the ROP.

CCRBs include, but are not limited to:

1. **Review of formative and summative evaluation data.**
2. **Review of higher headquarters policy change or direction,which affects a course of instruction.**
3. **Review of recommended lesson/course modifications to instructional materials.**
4. **Review of lesson additions/deletions to instructional materials.**
5. **Review of appropriate doctrinal publications, Individual Training Standards (ITS), and/or task list.**
6. **Review of recommended changes to ITSs.**

5502. CCRB USES

Changes pertaining to instructional time, resources, or the ITSs that form the basis for the course may be identified by a CCRB. Training and Education Command must approve any recommended changes that fall outside of content revisions. A CCRB's ROP can be used to effect changes in an instructional program that the formal school/detachment cannot perform or is not authorized to perform.

1. **Revise ITS Task List** A CCRB is the ideal means to record recommended changes to ITSs events and task lists so that the findings can be presented to Training and Education Command.

2. **Revising the Instructional Setting** A CCRB is the means for recommending revisions to the instructional settings identified in the ITSs. For example, if a school does not have the resources to teach an ITS task that is designated as "core," the school can submit a recommendation to change the instructional setting to "core plus" so that the task is taught to standard through managed on-the-job training (MOJT) and vice versa.

3. Revising Instructional Resources A CCRB is the means to record and present recommended changes to resources. All recommended changes to training time, personnel, equipment, facilities, or budget must be submitted to Training and Education Command with justification. Training and Education Command will review and staff the changes, providing the formal school/detachment with guidance.

5503. CCRB PREPARATION

Initial planning for a CCRB should be conducted three months prior to the CCRB. Regardless of CCRB composition, all proceedings and findings are formally recorded by the CCRB Recorder (discussed later in this section). In addition, a CCRB can be videotaped. Figure 5-34 lists the formal school detachment responsibilities and Figure 5-35 lists the CCRB member responsibilities.

Figure 5-34. Formal School/Detachment Responsibilities.

Formal School/Detachment Responsibilities
1. Scheduling the time, date, and location for the CCRB.
2. Providing guidance to members in advance of the CCRB so they will be prepared to discuss agenda items. This guidance includes the agenda, evaluation data, and any directions from higher headquarters. The CCRB agenda is based on a review of evaluation data and focuses on identified or perceived instructional deficiencies.
3. Assigning a Recorder to record the CCRB minutes. These minutes are used to develop the Record of Proceedings (ROP).
4. Assigning a facilitator to manage and guide the CCRB.
5. Funding for CCRB participants has to be worked out by the sponsoring school.

Figure 5-35. Assigned CCRB Member Responsibilities.

Assigned CCRB Member Responsibilities
1. Study all collected evaluation data and directions from higher headquarters that are related to the agenda items.
2. Be prepared to discuss recommended changes to instructional materials. If revisions are necessary, determine the specific changes and discuss how they should be made and how they will affect the instructional program. Recommendations must be specific and comprehensive and they must detail how changes should be implemented to best meet instructional needs.

CCRB MEMBERS

A CCRB will consist of:

1. **A formal committee with representation from instructors/curriculum developers.**
2. **Subject matter experts.**
3. **School supervisors.**
4. **Occupational Field (OccFld) Specialist and Task Analyst representation (if possible).**
5. **Operating Force Representation.**

1. Appointment CCRB members are appointed by the Director of the formal school/detachment or as directed by Standing Operating Procedures (SOP). Potential members may be contacted either by phone or correspondence. A CCRB should have representatives from each phase of the instructional program such as SMEs, curriculum developers, and instructors. Should major changes to the instructional program (e.g., resources, ITSs) be foreseen, a Training and Education Command representative should be invited to attend the CCRB.

2. Facilitate Discussion Of Agenda Items

a. **Facilitator** This is the individual who controls the meeting, ensures that all agenda items are discussed, and that recommendations are recorded. The facilitator will establish guidelines or parameters for making decisions. This may include the number of sources and type of evaluation information that will be reviewed and analyzed. This may also include the order/priority of agenda items and any imposed time constraints of the proceedings. Additionally, the facilitator should encourage and promote participation by all CCRB members. Contributions from all CCRB members should be treated respectfully and discussed.

1) Specific recommendations to each agenda item must be made. It is not necessary for all CCRB members to agree on a decision or an approach, but all recommendations must be reached by consensus. This is accomplished by weighing all information from all sources, dismissing unnecessary information, further analyzing points for clarification, and assimilating information into a solid recommendation.

2) Recommendations should be detailed. They must provide justification and they should include methods for implementing revisions to the instructional program. Recommendations for each agenda item should be reviewed and summarized by the facilitator.

3) All CCRB members must understand the recommendations and a consensus must be reached before the next agenda item is addressed.

b. **Recorder** Under the guidance of the facilitator, the recorder should record all recommendations legibly. The ROP must clearly state CCRB findings and recommended courses of action in a detailed, concise format. The required format for the ROP can be found in APPENDIX G.

3. Record of Proceedings (ROP) MCO 1553.2 mandates that evaluation results and recommendations for revising instruction at formal schools/detachments be documented through the publication of an ROP. ROPs are generated based on CCRBs and are used to revise instructional materials, provide information and judgments about the effectiveness of an instructional program, and effect changes in a program beyond the scope of the formal school/detachment. The ROP provides a summary of evaluation results, recommendations, and justification for revising training.

a. **Format** The required format for the ROP can be found in APPENDIX G. It must contain justification for any recommended revisions to instruction. The CCRB may make recommendations on revising instruction where appropriate. No changes may be made to the instruction unless supported by evaluation data or direction from higher headquarters.

b. **Members Review** The ROP must be checked and approved by CCRB members to ensure that specific recommendations have been made for each issue encountered in the instructional program. This review also ensures that each recommendation is documented with solid justification and that the content is an accurate reflection of the conduct of the CCRB.

c. **Member Certification** The members of the CCRB then sign the ROP certifying the accuracy of the content.

Recommendations should be detailed.

They must provide justification.

They should include methods for implementing revisions to the instructional program/POI.

5504. SUBMITTING THE ROP

Submit the final ROP to the CO/Director of the formal school/detachment for approval. A copy of the ROP will be sent to CG, TECOM (GTB/ATB) for review and a copy will remain on file at the school/detachment. If the CCRB has identified a required change to the ITS Order or T&R Manual, then the ROP must be submitted to TECOM with justification and supporting documentation.

See Figure 5-36 for a checklist of how to conduct a CCRB on the next page.

CONDUCT A CCRB CHECKLIST

PREPARE FOR THE CCRB	YES	NO
1. Study evaluation data and directions from higher HQ		
2. Set a time and date		
3. Ensure members are appointed		
4. Provide guidance to members (agenda, data, etc.)		
5. Assign a recorder		
CONDUCT THE CCRB	**YES**	**NO**
1. Open meeting on time		
2. Explain purpose of meeting		
3. Avoid stating preferences as to outcomes		
4. Explain ground rules:		
a. Establish discussion method (s)		
b. Establish decision making method (s)		
c. Establish time limits		
5. Employ effective group communication techniques:		
a. Promote systematic problem solving		
b. Keep group focused on problem solving		
c. Create/maintain suitable atmosphere		
d. Show respect and interest in group members		
e. Demonstrate sensitivity to attitudes		
f. Maintain impartiality		
g. Encourage balanced participation		
h. Refrain from dominating the group		
I. Deal with conflict effectively		
j. Consider several courses of action		
k. Consider drawbacks of preferred course of action		
L. Consider problems of implementation		
m. Provide "second chance" to air remaining doubts		
CLOSE THE CCRB	**YES**	**NO**
1. Review minutes		
2. Seek approval from members concerning the minutes		
3. Close CCRB on time		
COMPLETE THE CCRB	**YES**	**NO**
1. Write the Record of Proceedings (ROP) based on the minutes		
2. ROP reviewed and certified by all CCRB members		
3. Submit Record of Proceedings to director for approval and to CG, TECOM		
4. Evaluate the conduct of the CCRB		

Figure 5-36. Conduct a CCRB Checklist.

5600. ADMINISTRATION

SECTION 6

This section provides the evaluation requirement as stated by various Marine Corps Orders and Publications. These documents provide guidance to formal school/detachments on requirements in training. With the requirements being understood, personnel working in academics at the formal schools/detachments need to carefully consider the approach to evaluation. This is done through an evaluation plan for the school. The evaluation plan discusses how, where, and when to conduct evaluation, the types of data retrieved, and what to do with the data. Details on types of sampling are referred to in detail so that this can be addressed in the plan. In addition, specific information on how to design questionnaires, interview questions, and evaluation checklists is covered so that schools are able to ensure that the instruments used are meeting the needs of the school. Instruments should be designed with ease of data compilation and interpretation in mind.

5601. EVALUATION REQUIREMENTS

Schoolhouse administration needs to be familiar with the requirement for evaluation. The first step in evaluation planning involves the identification of an evaluation requirement. The source and scope of this requirement will drive subsequent evaluation activities. Establishing this requirement ensures that personnel and resources are allocated appropriately and effectively in support of an instructional program. This section provides direction and guidance in identifying an evaluation requirement and focusing on the source of this requirement: Marine Corps doctrinal publications and the formal schools/detachments.

1. Marine Corps Requirement For Evaluation Marine Corps doctrine or local SOP mandate the conduct of certain evaluations including their frequency, the type of evaluation to be conducted, and the specific issues to be evaluated. The following subparagraphs briefly describe the 1553 series of Marine Corps Orders (MCO) and Marine Corps Reference Publications (MCRP) as they pertain to instructional evaluation. The evaluator should be familiar with the effect of these orders on the organization's evaluation activities. In addition to these documents, Marine Corps Training and Education Command (TECOM) may be contacted for guidance concerning the conduct of evaluation.

a. **MCO 1553.1** MCO 1553.1_ Marine Corps Training and Education System, establishes CG, Training and Education Command as the organization that evaluates Marine Corps training and education policy, plans, concepts, and programs; conducts and reviews evaluations of training and education performed in units and institutions; and resolves emergent issues.

b. **MCO 1553.2** MCO 1553.2_, Management for Marine Corps Formal Schools and Training Centers, addresses Course Content Review Board (CCRB) requirements, curriculum assistance visits conducted by Training and Education Command, and the conduct of a Training Situation Analysis (TSA) to assess a formal school's philosophy, management, facilities, staffing, curriculum, and instructional support.

c. **MCO 1553.3** MCO 1553.3_, Marine Corps Unit Training Management (TM), establishes a Marine Corps-wide Training Management (TM) process wherein all individual and collective training conducted by units within the operating forces and supporting establishment shall be performance-oriented and prioritized by the commander relative to assigned missions. Additionally, the Marine Corps Combat Readiness Evaluation System (MCCRES) evaluation process is identified as the training management and diagnostic tool to improve training.

d. **MCO 1553.5** MCO 1553.5_, Marine Corps Training and Education Evaluation, establishes an evaluation policy and requirement to provide feedback on training and education programs from all Marine Corps activities. This order is the most comprehensive in setting forth guidelines for conducting, monitoring, and reporting evaluation.

e. **MCO 1553.6** MCO 1553.6_, Development, Management, and Acquisition of Interactive Courseware (ICW) for Marine Corps Instruction, establishes policy, prescribes requirements, and assigns responsibilities for the development, management, and acquisition of ICW for Marine Corps instructional programs.

f. **MCO 1553.7** MCO 1553.7_, Using the By Name Assignment (BNA) System provides information, guidance, and the responsibilities concerning the use By Name Assignment (BNA) system. BNA is the Marine Corps Class I System used to collect training workload data, to include entrants and graduates.

g. **MCRP 3-0A, Unit Training Management/MCRP 3-0B, How to Conduct Training** MCRP 3-0A and MCRP 3-0B set forth evaluation requirements for unit training. These manuals provide guidance to plan, prepare, and evaluate training conducted at battalion or squadron level units. These manuals help evaluators determine if unit training produces technically and tactically proficient Marines capable of accomplishing their assigned missions.

2. Formal School/Training Center Evaluation Requirement Evaluation is a continuous process whereby information is gathered to assess the value, worth, or merit of a program. A formal school/detachment may conduct an evaluation any time it is deemed necessary to verify the effectiveness of an instructional program, identify instructional deficiencies, or determine the most efficient allocation of instructional resources.

5602. PREPARE AN EVALUATION PLAN

After an evaluation requirement has been identified, a plan for conducting the evaluation is developed to ensure that no important steps in the process are overlooked. This section presents the critical elements of an evaluation plan, including supporting data, sources of data, sampling, an evaluation schedule, and data collection, analysis, and interpretation.

ELEMENTS OF AN EVALUATION PLAN

Whether the evaluation will be formative or summative, the planning topics discussed below will help ensure effectiveness. The evaluator must be prepared to modify the plan as required during the conduct of the evaluation if new issues are identified or events mandate revision of the plan. Any changes to the plan should be carefully documented. A sample evaluation plan is provided in APPENDIX H.

1. Data Required to Support the Evaluation This element of the evaluation plan is a clear and detailed statement of the data required to support the evaluation. For example, if the evaluation focuses on student mastery of learning objectives, student performance (test) data must be collected. If the focus concerns whether course graduates meet the needs of using commands, graduate on-the-job performance data are required. Throughout the planning process and during data collection, the evaluator should review this portion of the plan to ensure the appropriate data are collected to support conclusions and recommendations concerning the revision, maintenance, or termination of an instructional program.

2. Sources of Data As part of the evaluation plan, the evaluator must determine who will provide the data and what sources of information will be used. Sources include existing data, instructors and other school personnel, students, graduates, SMEs, and/or using commands.

a. Existing data include all task and course materials (e.g., ITS, T&R Manual, POI, lesson plans), documentation from higher headquarters that may change the course requirements, and previous evaluation data (e.g., CCRB or SME Conference reports, test data).

b. Data from individuals include student performance data (test results), instructor performance data, and graduate performance data.

3. Sampling This element of the evaluation plan should identify, when applicable, the sampling procedure including sample size and sampling technique to be used. Sampling is discussed later in this section.

4. Evaluation Schedule The evaluation plan should indicate when the evaluation would take place. In addition, the evaluation plan should include a schedule for each evaluation task or event. The schedule should be developed to ensure the evaluation is conducted when the most reliable data can be collected.

a. **Timely Evaluation** An evaluation should be planned to ensure timely collection of data. For example, if the evaluation focuses on graduate job performance, the graduates should have been on the job for at least 30 days, but less than three months to ensure valid data can be collected. Graduates new on the job may not have had the opportunity to perform certain tasks; and if they have been on the job longer than three months, they may have trouble separating what they learned in school from what they learned on the job. As an additional example, if the evaluation is being conducted to determine the consistency of instructional results, the instructional program must have been in place through several iterations. This will ensure the data collected will provide a comprehensive basis for decision making about an instructional program.

b. **Schedule of Evaluation Events** The evaluator must determine the time required to complete each evaluation activity (e.g., instrument design, data collection, data analysis) and prepare a schedule so each activity is conducted at the proper time. This involves factoring in the personnel and resources available for the evaluation. The use of a milestone chart to schedule the beginning and ending date for each event is recommended. This schedule should include the time allocated for the analysis, interpretation, and reporting of results. The evaluator should keep in mind that changes to the evaluation plan must be reflected in the schedule and may affect one or more evaluation activities.

5. Methods of Data Collection This part of the evaluation plan should specify how the data will be collected, what personnel will collect the data, and under what conditions the data will be collected.

a. **How Data Will Be Collected** Selecting the appropriate evaluation instruments is a critical step in planning, since the instrument controls the type and validity of data collected. These instruments are discussed in section 5200. Designing evaluation instruments is discussed later in section 5603.

b. **Who Will Conduct the Evaluation** The goal of the evaluation should always be considered when determining whether an internal evaluator (one who works within the formal school/detachment) or an external evaluator (one not associated with the formal school/detachment) will collect evaluation data. Due to time and budgetary constraints, most evaluations will be conducted by internal evaluators. However, if resources are available to permit a choice, the following should be considered when determining whether to use an internal or external evaluator. Figure 5-37 asks questions that will help decide who conducts the evaluation.

1) **Internal Evaluator** An internal evaluator is familiar with the instructional program and is able to provide immediate feedback during the evaluation. He/she is generally able to devote more time to an evaluation and at less cost than an external evaluator because he/she will not incur any Temporary Additional Duty (TAD) costs. However, an internal evaluator may lack the experience or expertise required to conduct the evaluation. In addition, the evaluator may be biased, especially if the evaluator has personal involvement in the instructional program.

2) **External Evaluator** An external evaluator is more likely to be impartial because he/she has no vested interest in the program's success or failure. His/her findings may be viewed as more credible, especially if the program is controversial and evaluation findings are to be used in settling a dispute. In addition, personnel associated with an instructional program are often more willing to reveal sensitive information to an external evaluator (since an internal evaluator may inadvertently breach their confidentiality). On the other hand, an external evaluator may be unfamiliar with the instructional program, requiring him/her to devote time to learn about it, and he/she may not have the ability to identify subtle issues or concerns related to the instructional program. If possible, an organization should use an external evaluator when the answer to any of the following questions is no.

Figure 5-37. Internal and External Evaluators

Internal vs. External
▪ Are technically qualified internal evaluators available to effectively and competently evaluate the program?
▪ Can internal evaluators be fully committed to the evaluation? That is, are they without additional duty responsibilities that would hinder the evaluation effort?
▪ Will there be sufficient internal evaluators to sustain an evaluation?
▪ Will the internal evaluator have the credibility to perform the evaluation objectively?

b. **Plan for Briefing/Training Data Collectors** Once personnel requirements have been identified, a plan for briefing and training data collectors should be developed.

1) **Personnel Brief** The brief should include the intent of the evaluation, the role of the data collectors, when and how they will collect the data, how to monitor the process, and how to ensure that data collected are complete.

2) **Personnel Training** A relatively simple orientation for data collection personnel is all that will be needed for most evaluation instruments. However, if interview or observation instruments are to be used, personnel may need training sessions on their use, including written instructions, job aids, and/or practice. Procedures (including time tables) for this training should be included in the evaluation plan.

c. **Conditions Under Which Data Will be Collected** The plan should also specify the appropriate conditions for data collection. For example, will students be observed during a class? Will they be tested in groups or individually? Will graduate performance on the job be assessed? Will evaluation instruments be mailed, emailed, or administered in person? Planning the data collection effort will ensure that valid data can be collected under the conditions specified.

d. **Data Collection Arrangements** The evaluation plan should also specify the administrative requirements to support data collection. Depending on the evaluation to be conducted, these requirements may include contacting school or command personnel to schedule visits, making travel reservations, ensuring that evaluation instruments are duplicated and mailed on schedule (if not carried by the evaluator), etc.

6. Method for Data Analysis and Interpretation The evaluation plan should specify the method for data analysis and interpretation. This includes formatting, coding, organizing, storing, and retrieving the data along with the statistical techniques used to analyze the raw data and methods for interpreting results. Refer to Section 5302 for information on the analysis and interpretation of evaluation data.

7. Method for Reporting The evaluation plan should specify the method for making recommendations and reporting evaluation results.

5603. SAMPLING

It is not always feasible to survey or test every member of a specific population, e.g., every Marine in the Marine Corps. Therefore, a sample representative of the population is selected for evaluation. When selecting a sample, the larger the sample, the more precise the estimate of the characteristic in the population. Sampling techniques are particularly common when conducting surveys or interviews rather than testing individual performance in school or on the job where it is important to test everyone. Often the target population (the people or events that are of interest) is too large to survey practically, so an evaluator focuses instead on a subset of the population known as a sample.

1. Sampling Techniques When a sample is selected, it is important that the sample be unbiased or truly representative of the whole population to provide the highest degree of reliability and validity with respect to making conclusions and recommendations regarding an instructional program. There are two basic ways to achieve a representative sample: simple random sampling and stratified random sampling.

a. **Simple Random Sample** A simple random sample is one in which every member of the population has an equal chance of being selected for the sample and the selection of any one member of the population does not influence the chances of any other member being selected.

b. **Stratified Random Sample** A stratified random sample involves dividing the population into two, three, or more strata [e.g., rank, military occupational specialty (MOS)] and then randomly sampling from each stratum. "Strata" refers to subpopulations. This method of sampling allows the evaluator to generalize results to the population as a whole, particularly if the population is not homogenous. A stratified random sampling procedure ensures that segments of the population having a low frequency of occurrence (e.g., female Marines) are represented in the sample.

2. Process For Selecting A Sample Size The selection of a sample size is not a subjective process. In lieu of any other method, evaluators can rely on their past experiences to select a sample size. However, there is a standardized method that can be used to determine an appropriate sample size. To calculate sample size, an expected response rate and confidence level must be identified. The expected response rate is the proportion of responses expected from the population being sampled. For example, if a survey is sent to 100 Marines and it is expected that 30 Marines will return the survey, the expected response rate is 30%. The confidence level corresponds to the degree of assurance or confidence that a given value will occur other than by chance. The most commonly used confidence levels are 95% and 99% such that a 95% confidence level means that the likelihood of a value occurring by chance is 5 in 100 and a 99% confidence level corresponds to the likelihood of a chance occurrence of 1 in 100.

a. **Determining Sample Size for a Random Sample** APPENDIX I provides a sampling table and formula for determining sample size. For example, for a population of 4,200 course graduates, an estimated (desired) return rate of 85%, and a confidence level of 95%, sample size would be determined using the following procedure:

1) **Using APPENDIX I, locate the number corresponding to the population size. Since 4,200 is not provided in the table, round the number up or down to the nearest value. For example, the population value of 4,200 would be rounded down to 4,000.**

2) **Locate the value corresponding to the 95% confidence level with a population size of 4,000. Using APPENDIX I, this value is 364 (meaning that 364 questionnaires are required). This figure should be 85% of the questionnaires mailed out.**

3) **To determine the number of questionnaires that need to be mailed out to obtain 364 usable questionnaires, substitute the values in the formula provided in APPENDIX I. Using our example, for a population of 4,200 and an expected return rate of 85%, the desired sample size would be 364. Therefore, to obtain an 85% response rate (364 responses), 428 questionnaires need to be gathered.**

b. **Determining Sample Size for a Stratified Sample** If an evaluator wishes to divide a population into several strata (such as rank or MOS) and select sample sizes based on these strata, sample size is determined in the same way described above. In a stratified sample, population size corresponds to the number of individuals within each stratum. For example, given a graduating class of 200 students in which 160 are male and 40 are female, two sample sizes would be calculated, one for a population size of 160 and another for a population size of 40.

5604. DESIGN EVALUATION INSTRUMENTS

The evaluation instrument is the tool that elicits information to accurately assess the effectiveness and efficiency of an instructional program. An evaluation instrument controls the nature and type of information collected and the reliability and validity of that information. This section provides additional guidance on the design of evaluation instruments such as survey questionnaires and interviews, and the use of evaluation checklists. Particular emphasis is placed on guidelines and considerations for developing and using standardized evaluation instruments, stressing the importance of clarity, consistency, and brevity in their design.

1. Survey Questionnaires A survey questionnaire must be well-organized and easy to read to be an effective data collection tool. When selecting or designing survey questionnaires, the following guidelines should be followed:

a. **Format** Format is important in gaining the cooperation of respondents, analyzing the data, and interpreting the results. Design the layout or structure of a questionnaire so that it is attractive and uncluttered, permitting the respondent to readily determine what types of questions are being asked and how to record responses. A respondent should be able to complete the questionnaire within a short period; respondents will often put aside and fail to complete a questionnaire that requires more than 20 minutes of their time.

b. **Instructions** To ensure that the questionnaire is completed properly, clear, concise instructions should be included at the beginning of the questionnaire. These should include a brief explanation of the purpose of the questionnaire, how it is organized, and how responses should be recorded. If the questionnaire is mailed or distributed for later return by respondents, instructions for its return should be provided and a metered return envelope should be included.

c. **Questionnaire Items** Questions should be grouped by topic or subject and presented in a logical format. For example, in a questionnaire administered to graduates of Basic Rifleman covering both M16A2 Service Rifle and M203 Grenade Launcher, all questions pertaining to the Service Rifle should be grouped together and all questions pertaining to the Grenade Launcher should be grouped together.

d. **Response Format** When possible, the method for responding to questionnaire items should be consistent to avoid confusion and facilitate the recording of accurate responses. If a variety of answer formats must be used, group items with the same answer format together. Survey questionnaires involve self-reporting by respondents and, therefore, provide qualitative data. For those data to be scored for later analysis and interpretation, they must be quantified. The response format of the questionnaire controls the way the data are gathered, how they can be quantified, and the ease or difficulty of their quantification. Response formats include open-ended and fixed alternative (or closed) questions. The fixed alternative format, which includes nominal, ordinal, and interval scale responses, provides data that are more easily quantified for later scoring and analysis. Open-ended responses may also be quantified for data analysis, although it is a much more time-consuming process. Figure 5-38 provides examples of questionnaire response formats.

1) **Open-ended** An open-ended question has no pre-determined response category. It allows the respondent to answer the question in his/her own words without restricting the kind of answer he/she can give. Data collected using open-ended questions can be quantified by categorizing the responses and assigning a number to each category. Open-ended questions in survey questionnaires or interviews allow respondents to provide additional comments, descriptions, and rationale or explanation for their answers. They are useful for collecting information pertaining to perceived effectiveness of a particular course of instruction. Unlike rating scales and checklists, information gathered from open-ended questions can be difficult to collate, analyze, and quantify because scores or ratings are not assigned to responses. However, an answer key can be made to allow open-ended (e.g., essay) questions to be scored for partial and full credit through the assignment of point values. Refer to Section 5302 for information on quantifying data.

2) **Nominal Scale** A nominal scale response format is used primarily to elicit information that falls within a single measurement dimension in which responses can be easily categorized such as sex (e.g., male, female) or rank (e.g., corporal, sergeant, captain). This type of scale is particularly appropriate for gathering demographic information.

3) **Ordinal Scale** A Likert rating scale is an example of an ordinal scale response format and is most commonly used to measure respondents' attitudes, preferences, or feelings about a topic. A Likert rating may involve a 1-3, 1-4, 1-5, 1-6, or 1-7 scale. Level of agreement, level of preparedness, and level of ability are a few examples of what the scale can measure. Each statement requires only one judgment and carefully avoids ambiguity in expression or interpretation. Figure 5-38 provides more information on the Likert rating scale.

Likert Rating Scale

- Method of recording responses to a question.
- Scale that responds to a spectrum of responses (e.g., behavioral ratings, frequency ratings, attitudinal ratings) concerning a certain topic.
- Respondents check the response that corresponds to the intensity of their judgment of the topic.
- Ideal for obtaining varying judgments or scores on a topic by using a number of statements on the same subject and giving an intensity value for each.

Figure 5-38. Likert Rating Scale.

QUESTIONNAIRE RESPONSE FORMATS

Open-Ended

1. What do you feel is the most important information you received while attending the Supply Officer Course?

_____
_____
_____

Nominal Scale

2. Which of these qualities do you feel is the most important for an instructor to possess? (Circle the appropriate number below.)

1. In-depth knowledge of subject matter
2. Professionalism
3. Sincerity

Ordinal Scale

3. The Supply Officer School's minimum rank requirement for attendance is Major. Which of the following expresses your opinion concerning this statement? (Circle the appropriate number below.)

1. Strongly disagree
2. Disagree
3. Agree
4. Strongly agree

Interval Scale

4. How many personnel are assigned to your unit? (Circle the appropriate number below.)

1. Under 25
2. 26-50
3. 51-75
4. 76-100
5. Over 100

Figure 5-39. Questionnaire Response Formats.

4) **Interval Scale** An interval scale response format elicits information that is quantifiable in terms of absolute or continuous values such as age, years of service, time in billet, etc. This type of question can be designed to require the respondent to either write in his response or select a particular interval in which a value falls.

5) **Development of Questionnaire Items** Questionnaire items should be short, direct, and written at a reading level appropriate to the respondent population. The evaluator should adhere to the following guidelines when developing questionnaire items. Figure 5-40 provides examples of good and poor questions.

Figure 5-40. Guidelines for Writing Questionnaire Items.

GUIDELINES FOR WRITING QUESTIONNAIRE ITEMS

1. Avoid the use of negatives.

   POOR: The instructor was not available to answer my questions. (Yes/No)
   GOOD: The instructor was available to answer my questions. (Yes/No)

2. Use short, common words; avoid jargon.

   POOR: Does the AIR include IRFs?
   GOOD: Does the After Instruction Report (AIR) include Instructional Rating Forms (IRF)?

3. Do not combine two issues in one questionnaire item.

   POOR: Was the instructor knowledgeable and effective?
   GOOD: Was the instructor knowledgeable?
   Was the instructor effective?

4. Avoid leading questions.

   POOR: Do you feel the school needs to lengthen the course to better equip the graduates?
   GOOD: Are there changes the school can make to the course to better equip the graduates?

5. Ensure the question can be answered by the respondent.

   POOR: Was your knowledge comparable to the previous students' knowledge when you entered the class?

   GOOD: Do you feel you had the prerequisite knowledge and skills to succeed in this course?

6. Avoid the use of emotionally-tinged words and embarrassing questions.

   POOR: Did you have difficulty understanding the materials?
   GOOD: Were the materials presented in a manner easy to understand?

6) **Distribution** In addition to well-written questions, valid results from survey questionnaires depend on the selection of respondents. A representative sampling is essential. Variations in job requirements occur because of command, geographic locations, organization level, etc. Therefore, the sample should include respondents assigned to each using location in the population. Section 5603 provides detailed information on sampling.

a) **When to Send Questionnaires** Proper timing is important when sending questionnaires. For example, questionnaires should be in graduates' hands one to three months after graduation and assignment to the using command. Beyond three months, it may be difficult to determine whether the graduate learned a skill from the instructional program or on the job. If the questionnaire is distributed too soon after course completion, the graduate may not have had time or occasion to perform all of the tasks taught. However, the optimum time for questionnaire distribution is also dependent on the complexity of the job/tasks the instruction covered.

b) **Follow-up** Follow-up can ensure the return of a sufficient number of completed questionnaires to support valid and reliable data analysis. Procedures for appropriate follow-up should be included in the evaluation plan. These would include the timing of the follow-up, a method for identifying non-respondents, and the method of follow-up (e.g., phone, mail). When the date for follow-up arrives, reminder calls or notices to non-respondents should be made to encourage their completion of the questionnaire. It is also a good practice to thank respondents for their participation. Sending a simple thank-you form requires little time but can be very worthwhile in motivating respondents to cooperate in future surveys.

2. Interviews Although interviews may be structured or unstructured, the collection of reliable data for evaluation purposes is best obtained from structured interviews. The following are guidelines that can be used when conducting interviews. The advantages and disadvantages of interviews are listed in Figures 5-42 and 5-43.

a. **Introductory Statement** The interview should always begin with an introductory statement that outlines the purpose and structure of the interview. The purpose should be explained in terms the respondent can understand and should identify what types of questions will be asked. The introductory statement should also provide a clear transition to the interview itself.

b. **Conducting the Interview** The goal of the interviewer is to maximize the flow of information from the respondent.

Figure 5-41. Conducting the Interview.

Conducting the Interview
▪ Keep the language pitched to the level of the respondent. Do not use technical terms or acronyms unless the respondent is familiar with them.
▪ Choose words that have the same meaning for everyone.
▪ Do not assume the respondent has factual or firsthand information.
▪ Establish the frame of reference for the questions being asked. For example, to narrow a respondent's comment on the effectiveness of testing, the interviewer may ask the respondent to focus on performance testing during the last three weeks of a course.
▪ If asked, either suggest all possible responses to a question or do not suggest any.
▪ If unpleasant questions must be asked, give the respondent a chance to express his positive feelings first by structuring the interview so those questions are asked first.
▪ Speak clearly and slowly and listen to the respondent's answer before recording the response.
▪ Include a closing statement to let the respondent know the interview is concluded.

c. **Types of Interview Questions** The type of interview questions developed should be based on the objective of the interview.

1) **Open-ended Questions** A question that asks for narrative responses and allows respondents to respond in their own words is an open-ended question. Open-ended questions are used when a discrete answer is not desired or possible (i.e., there is no yes/no or categorical response possible). These questions often rely on the respondent's opinion and judgment rather than the respondent's knowledge of information or facts.

2) **Probing or Clarifying Questions** Ask probing or follow-up questions to confirm a respondent's answer or to clarify what the respondent has said. The respondent's statements should be included in the probe to provide a point of reference and elicit elaboration or clarification of a topic.

3) **Closed Questions** A question that limits respondents' answers to predetermined response categories is a closed-ended question. Multiple choice and yes/no questions are examples of closed-ended questions. Closed questions employ a nominal, ordinal, or interval scale response format. Closed questions are used to elicit information that is easily categorized or to elicit specific factual information such as rank, age, etc. Closed questions restrict the range of responses received.

d. **Recording Responses** For open-ended questions or questions in which probing or clarifying responses have been provided, the interviewer should:

1) Record responses using the **exact words and phrases** used by the respondent.

2) Use key words or phrases to further clarify a response or as a reminder of what was said.

Advantages of Interview
▪ If the questions are few and easy to answer, the interview method results in a higher percentage of responses and, therefore, better sample results than a survey questionnaire.
▪ The interview method ensures that the targeted audience answers the questions. The individuals required to answer the questions can be pre-selected, ensuring the evaluation information is obtained.
▪ An interviewer can judge the sincerity of the respondent as he gives his answers.
▪ An interview can be conducted simultaneously with observation of performance. Observation of performance adds merit to the interview information obtained.

Figure 5-42. Advantages of Interview.

Disadvantages of Interview
▪ Face-to-face interviews can be expensive and time consuming based on the time required to conduct the interview and location of the interview.
▪ Interviews do not allow respondents to remain anonymous which can affect their responses.
▪ Interviews preclude the respondent from returning to a question at a later date.
▪ If a respondent cannot be present during the scheduled time, it can be difficult to reschedule the interview.
▪ An interviewer can introduce bias into the study by suggesting a possible answer to a question when the respondent has difficulty giving one. This produces questionable evaluation results.

Figure 5-43. Disadvantages of Interview.

3. Evaluation Checklists Checklists are typically used when the evaluation consists of a review of documentation, course materials, etc., or an observation of performance. Checklists that are used as evaluation instruments are not simply lists of items that can be "checked off" as they are identified or located. These checklists consist of carefully worded questions that the evaluator answers by his review of course materials or observation of course components (e.g., graduate or instructor performance, conduct of a class). If existing materials will be reviewed as part of the evaluation, data are collected via checklists as the evaluator reviews the applicable documents. To perform an evaluation of an instructional program, two or more of these checklists may be used, as required. Checklists can be used to conduct both formative and summative evaluations of an instructional program.

a. **Use of Checklists During Formative Evaluation** During instructional program development, checklists can be used to ensure instructional development is proceeding according to plan. Checklists are also used to assess and validate instructional materials. The use of checklists helps the evaluator ensure that the materials being developed (e.g., learning objectives, test items, lesson plans, student materials, instructional setting, media) will result in an effective and efficient course of instruction. Using evaluation checklists as a systematic method for validating instruction ensures:

1) The instruction does not contain unnecessary information, maximizes the use of instructional time and media, follows the SAT process, and prepares graduates to perform their job tasks to the specified standard.

2) An audit trail is created that enables evaluators to track each component of the instructional program to the ITS or T&R event it supports and to document the SAT methodology followed. To create an audit trail, a progress or process method can be used.

a) **Progress Method** This method is used to keep management informed of the progress of the course development effort. In consultation with the course manager(s), the evaluator should identify what information the manager needs to make effective decisions concerning the course and how frequently it is needed. A recommended approach is to report on the completion of key checkpoints in the course development (See Figure 5-44 for a portion of a sample project schedule). Often, managers need only to know that an activity was completed on time. If deviations occur, they should be explained and discussions held to produce an acceptable solution. When the development effort is complete, the project schedule will provide one form of an audit trail that can later be reviewed when evaluating an instructional program.

Activity	Estimated Completion	Actual Completion	Note
Develop Course Schedule	20 Sep	20 Sep	
Develop Lesson Plan	20 Dec	20 Jan	(1)
Develop Student Guide	20 Jan	20 Feb	(2)
Develop Media	30 Jun	30 Jun	

Notes:
(1) Delay of travel funds caused site visit to be postponed.
(2) Development was dependent on completed lesson plan.

Figure 5-44. Sample Project Schedule.

b) **Process Method** This method uses a checklist to describe and document the actual development process of a specific course. A recommended approach is to list every major activity of the course development process. Changes to the standard SAT procedures as well as steps or processes not completed should be documented. Figure 5-48 illustrates a sample process checklist, although any suitable form can be used. The important information to be captured is the explanation of any deviations so that future managers will know what was done during course development.

Development Activity	Completed YES	Completed NO	Explanation
Develop Course Schedule	[		
Review Source Documents	[		
Determine Course Structure	[		
Organize TLO's and ELO's	[		
Assign Lesson Titles		[	Used existing titles
Assign Lesson Designators	[		
Estimate Instructional Hours	[		
Organize Information	[		

Figure 5-45. Sample Process Checklist.

b. **Use of Checklists During Summative Evaluation** During a summative evaluation, checklists provide the evaluator with a systematic method for examining an instructional program to ensure it prepares graduates to perform their job tasks to the specified standard. Checklists can be used to evaluate the following:

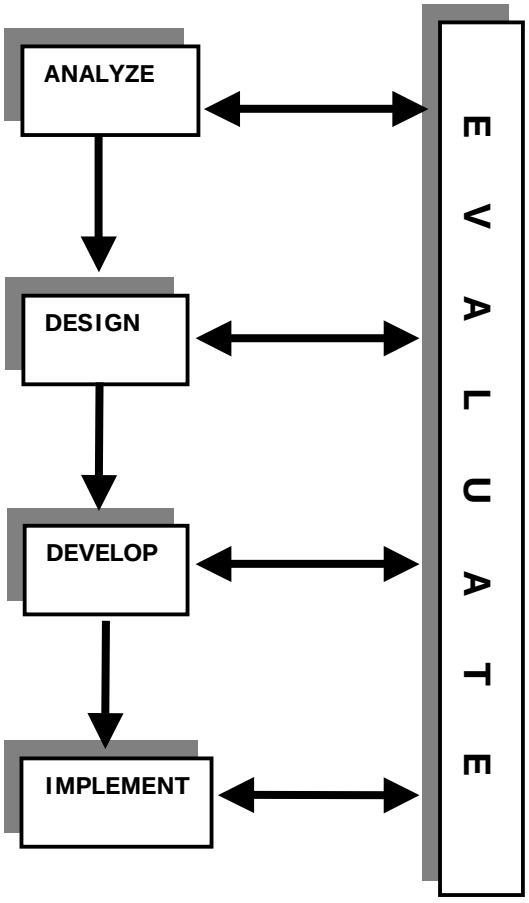
1) **Student Performance** A pass-fail checklist is commonly used in performance tests where students are rated on mastery of learning objectives. A typical approach to this type of checklist is to list the learning objective behaviors (although it can also be detailed enough to list performance steps) on one half of the page. On the other half, present the checklist in two columns, one to be checked if the student successfully accomplishes the learning objective (Pass) and one column to be checked if the student does not accomplish the learning objective (Fail). This checklist is easy for an instructor to complete while observing student performance during a performance test. If an evaluation includes visits to using commands to evaluate graduate on-the-job performance, a very similar checklist may be used. Changes to the checklist may be required to account for differences between the instructional environment and that of the "real world."

2) **Instructor Performance** Instructors are commonly evaluated and rated by students through Instructional Rating Forms (IRF) and Course Critique questionnaires. An evaluator can use a checklist during observation of a class to record data on the instructor's ability to effectively present the materials in the lesson plan (See APPENDIX E for a sample checklist). The checklist can also be used to assess the instructor's qualifications.

3) **Course Materials** Course materials (e.g., lesson plans, student materials, media, test items) should be reviewed and updated regularly. The evaluator should ensure that current materials are being used as planned and in accordance with an approved POI (see APPENDIX C for the Master Lesson File checklists). In addition, a review of course materials should include course control documents including the POI, record of proceedings (ROP), etc. Course control documents provide an administrative check of how the course is being implemented in support of the ITS or T&R.

4) **Instructional Environment and Instructional Equipment** An evaluator can use checklists in determining whether existing instructional facilities are meeting the requirements of the instructional program (see APPENDIX E for a sample checklist). The evaluator should first review the course requirements for instructional equipment and facilities. Evaluation of the instructional environment should include appearance and cleanliness, condition, adequacy of space, and environmental factors (e.g., noise, lighting, distractions). The condition, operation, and appropriateness of instructional equipment should also be evaluated. A preventive maintenance plan should be followed to ensure training devices, simulators and computer equipment remain operable.

ADULT LEARNING

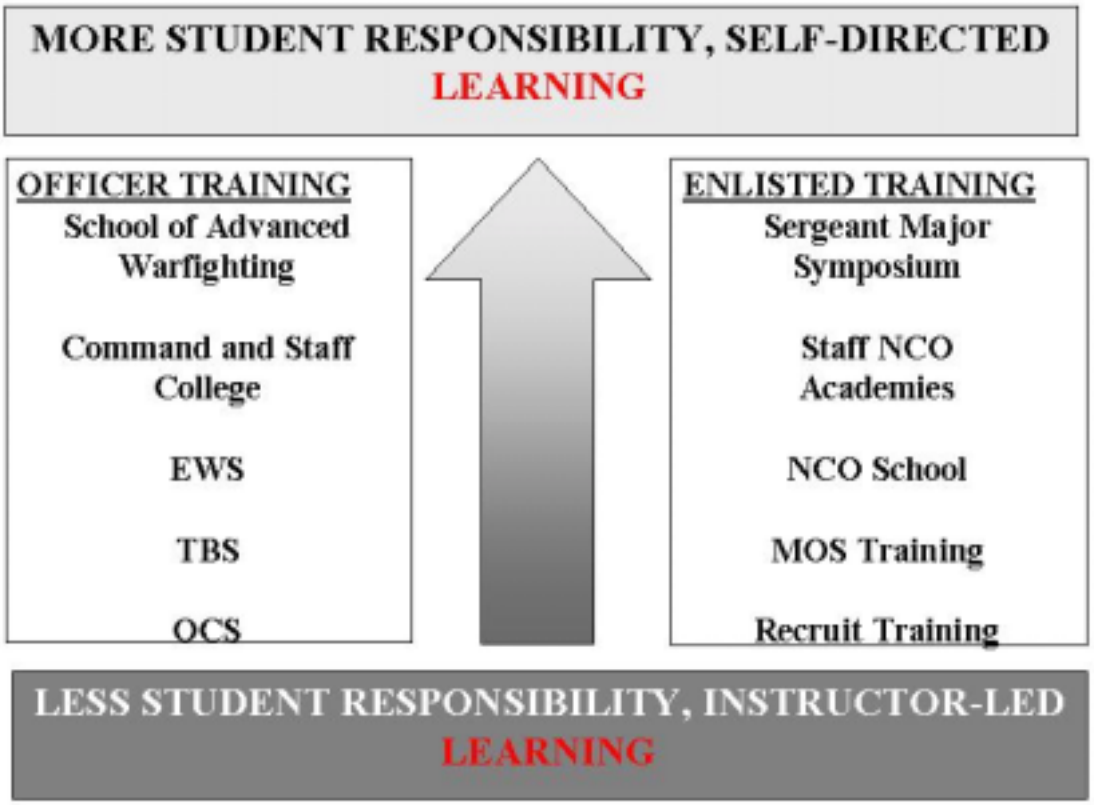


In Chapter 6:

Chapter 6

6000. INTRODUCTION

The literature on adult education generally supports the idea that adults should be taught differently than children and adolescents. However, until late in the 20th century, all students were treated alike. The instructor was at the center of instruction and considered to have all the answers, while students were merely the passive receptors of what the instructor delivered. Little thought was given to the experiences and knowledge that students brought to the learning environment, especially what adult learners had to offer. Fortunately, the past 50 years has seen rapid growth in adult learning theory and the adoption of its principles in the military training environment. The U.S. military trains more adults than any other institution, and increasingly we are incorporating ideas to improve training. How can Marines assist in their own learning? What motivates adults to want to learn? Is there a shared responsibility between the instructor and the student in learning? These questions and many more will be addressed in this chapter. It will introduce and discuss pedagogy and andragogy, the Marine Corps student, learning styles, adults and how adults learn, the domains of learning, motivation techniques, and group dynamics. The chapter will culminate with a discussion on the application of these principles to the SAT process.



Progression from entry-level through career-level training.
Figure 6-1

SECTION 1

6100. PEDAGOGY TO ANDRAGOGY

Formal educational institutions in modern society were initially established exclusively for the education of children. As such, the theory that dominated education was that of pedagogy, the art and science of teaching children. The growth through the centuries of centers for higher education was not accompanied by the development of any new theories on how education in these institutions should be addressed. The theories that had been applied for centuries to the education of children were simply applied to anyone pursuing education or training, regardless of age or experience. Early in the 1960s, however, adult educators in Europe began to focus their research on the education of adults. These educators, led by Malcolm Knowles, adopted the term *andragogy*, the art and science of teaching adults, to describe their emerging theories about adult learners. Adult learning theory, andragogy, provides some basic assumptions that should be considered when preparing to teach or train adults.

6101. THE MARINE CORPS STUDENT

The nature of our organization is such that everyone we train is an adult learner. However, not all adult learners or learning environments are alike. Before attempting to design, develop, or implement training for Marines, it is necessary to know more about who Marine students are and how they learn.

One of the factors that curriculum developers and instructors consider when creating or implementing training is establishing whom they will teach. For example, consider how drill instruction differs for a recruit at MCRD from that of a Sergeant going to Drill Instructor School. Both are considered adults, but the approach to training each is completely different (see figure 6-1). Entry-level Marines learn in a very structured, teacher-centered environment because they lack experience or knowledge of the Marine Corps. The Marine Corps is a new world to them. More structure must be provided for instruction to be efficient and effective. At the same time, however, it is important to treat them like adults. They do bring life experience into the classroom and they will exhibit some characteristics of adult learners. Young Marines will be more motivated and more apt to take responsibility for their learning if they are respected as adults.

By contrast, senior and career-level Marines bring a wide range of knowledge and experience into the instructional environment. As such, more learner-centered activities are needed to allow the students to use and build upon the knowledge and experience they already possess. This chapter will discuss adult learning theories in broad terms and how they apply when designing, developing and implementing instruction for different populations of Marine Corps students.

SECTION 2

6200. CHARACTERISTICS OF THE ADULT LEARNER.

Most adults would not want to sit through a class on the alphabet, taught by a drill instructor that screamed at them for no apparent reason. This is because most adults have developed a sense of self that they expect will be respected and appreciated in a learning environment. These and many other characteristics have been found to be somewhat universal amongst adult learners. These characteristics should be studied and carefully considered when designing, developing and implementing instruction for adults.

SOME CHARACTERISTICS OF ADULT LEARNERS

1. They prefer self-direction.
2. They have experience that should be used and built upon.
3. Their readiness to learn depends on their needs.
4. Their orientation to learning is life or problem-centered.
5. They often learn best in small groups.
6. They need a supporting and challenging environment.

1. Self-Direction Adults avoid, resist, and resent situations where they are not respected as adults. They desire to be treated by others as capable of self-direction.

a. Adults need a learning climate that provides them with a sense of acceptance, respect and support. Those who have a positive self-image are likely to be better learners. Criticizing or judging adult learners can quickly shut down the learning process. When necessary, instructors must correct the adult learner in a supportive and respectful manner.

b. Any student's ability to learn is directly proportional to the degree of emotional safety he or she feels. Anxiety, fear, and lack of confidence are emotions that can negatively affect a student's ability and willingness to learn. Well designed and delivered instruction that considers the potential for anxiety can reduce or eliminate fears. An example is the Marine Corps Combat Water Survival School (CWSS). Marines at CWSS are trained in stages that progress from the shallow end of a pool to the high dive platform. Because they are able to succeed at simple tasks before moving on to more difficult ones, fear is minimized.

c. Students and instructors have a shared responsibility for learning. The instructor provides the atmosphere, resources and guidance the students require for success; the student is responsible for the learning.

d. Instructors take on the role of facilitator, mentor, or coach, providing scaffolding and “just-in-time” assistance to guide the student in their quest to build knowledge and gain skills. Activities that have students reflect upon their learning and self-evaluate can be very effective for adult learners because it gives them “ownership” of the problem and the solution.

2. Learner Experience Adults possess a large repertoire of previous learning comprised of formal education, training, culture, and life experience. Based on this prior learning, adult learners formulate assumptions about the world. Their assumptions can either help or hinder the learning of new material. Learning new concepts is more difficult for students whose assumptions differ from what is being taught. Adults enter the learning environment with a wide range of experiences. The older the learners, the more experience they have and the more varied the group. People attach more meaning to what they gain from experience than what they acquire passively, thus it is critical that instructors and curriculum designers consider students' experiences during the instructional process. Some instructional techniques that can be used to capitalize on students' experiences are problem solving, case studies, small and large group discussions, role-playing, and simulation exercises.

a. Effective questioning techniques (refer to Chapter 4, Section 4401) is one way to uncover student experiences that may have bearing on a lesson. Allow students to provide real-world examples to help anchor and solidify instruction.

b. Group and individual projects involving open-ended and/or real-world problems can be used to allow students to apply what they have learned and to hone their problem solving skills.

c. Exposure to multiple perspectives and experiences will challenge the students to review their previous experiences and question their assumptions. Learning is accomplished when the recognition of and reflection upon differing experiences and assumptions forces students to change their view. Open discussions and journaling can assist in this endeavor.

3. Readiness to Learn Adults are motivated to learn when they feel the learning is relevant to their jobs or their personal lives. They need to know why information or skills are important to them, what they can anticipate learning, and how it will be taught. It is important to provide this information in the introduction to the lesson. Conversely, they are not usually motivated to learn what they will have little or no use for. However, there are times when Marines must attend training regardless of their motivation to do so. The implication for curriculum developers is that they must know their audience so they can choose subject matter and appropriate delivery methods, and also effectively explain their relevance.

4. Orientation to Learning is Life or Problem-Centered Training must be attuned to the concerns of the students. Adults are motivated to learn to the extent that they perceive the new knowledge or skills will help them perform tasks or deal with problems that they confront in their daily lives. Lesson plans should include materials that address real life concerns. Case studies, simulations, and practical applications using realistic settings provide a problem-centered orientation. Instructors can also demonstrate the relevance of concepts by relating them to the experiences of their students.

5. Small Groups Research on adult learning has shown that most adults learn best in small groups. This makes students responsible not only for their own learning, but for the learning of the group. Students who grasp concepts faster help those who do not, and the collective experience of the group adds to the process of learning. Further, working in small groups forces students to hear and consider multiple perspectives and requires them to make concessions to accomplish the mission of the group. Small groups (fire teams, squads, etc.) are the backbone of the organizational structure of the Marine Corps.

6. Supportive and Challenging Environment Being openly criticized by an instructor is a sure way to stop the learning process. Instructors must provide and maintain a learning environment that assists students in meeting goals and objectives. Training and supervision of newly assigned instructors will help reduce these barriers to learning. Instructors of adults must become proficient in the use of constructive feedback and positive reinforcement. Instructors can remove or lessen anxieties by spelling out clearly up front expectations for participants, and setting up group norms, for example, letting participants know that active participation is encouraged, divergent opinions are welcomed, and that you are there to help them learn. Further, instructors must learn how to be effective facilitators, encouraging groups to discuss their solutions to problems and facilitating the interaction between group members, groups themselves, and the class as a whole. Additionally, curriculum developers and instructors must strive to create learning environments that build upon the experience of the students and challenge them to go beyond what they know or can do. Two approaches to creating such an environment are “without the information given” (WIG) and “beyond the information given” (BIG). “WIG” environments provide the students with little guidance, which forces them to discover on their own solutions to the given problem. “BIG” environments provide the students with a scenario and a possible solution, and they must delve deeper and find other, better solutions. Teaching senior SNCOs how to read a map or use a compass will not challenge them, but telling them to lead a convoy through enemy territory – where they would have to employ previously learned skills and problem-solve – will test their mettle and challenge their ability. Scaffolding (providing supports and gradually taking them away as students progress), mentoring, and coaching are other effective instructional techniques.

6300. LEARNING STYLES

SECTION 3

A learning style refers to an individual's preferred way of gathering, interpreting, organizing, and thinking about information. Some students need to see the information on a chart, screen, or paper; others may need to hear it explained or discussed; and many need to perform tasks themselves in order to learn. There are at least sixteen models of learning styles and 20 cognitive dimensions that have been claimed as true (Boylan, 1989). This chapter provides a summary explanation of learning styles and preferences. Understanding these preferences will impact the way schools plan for and implement instruction. Figure 6.2 provides the characteristics of various learning styles and instructional tips that apply to each.

6301. Instructional Preference Model

Instruction that addresses all three learning styles will be the most effective.

This model focuses on the medium by which information is presented. It assumes that students have a preferred method for receiving information. Because classes are diverse, and thus have a variety of preferred methods within each, instruction that addresses all three learning styles will be the most effective.

1. Visual Learners Visual learners tend to learn better when they see the subject matter to be learned. They like to learn with photos, diagrams, charts, physical objects, or demonstrations. To teach a visual learner how to swim, do a demonstration or use a video.

2. Auditory Learners Auditory learners tend to learn best when they hear the subject matter to be learned. To teach an auditory learner how to swim, give verbal instructions prior to getting in the pool.

3. Kinesthetic Learners Kinesthetic learners tend to learn better by performing the new task. Although they may benefit from other methods, they learn best when they perform a task. When teaching a kinesthetic learner how to swim, a lecture is less useful than a practical application session.

Learning Style	Characteristics	Instructional Tip
Visual	☑ Needs to see it ☑ Strong sense of color ☑ Trouble following lectures ☑ Misinterpretation of words	☑ Use graphics to reinforce learning (i.e. charts, graphs, pictures) ☑ Use written directions ☑ Use flow charts and diagrams for note-taking ☑ Use videos
Auditory	☑ Prefers to get information by listening ☑ Difficulty following written directions ☑ Difficulty with reading and writing	☑ Read directions ☑ Use audio ☑ Have students participate in discussions
Kinesthetic	☑ Prefers hands-on learning ☑ Learns better when physical activity is involved	☑ Use experiential learning (i.e. role play) ☑ Have students do as much as possible (practical application) ☑ Provide frequent breaks in study periods ☑ Recommend students to memorize or drill facts to be learned while walking or running ☑ Recommend students write out facts to be learned several times

Figure 6-2. Learning Styles

6302. Accommodating Learning Styles

It is not feasible for instructors to prepare individual lesson plans for each of the learning styles described above. Therefore, curriculum developers must commit themselves to developing curriculum that appeals to a variety of learning styles. This takes thought and creativity, but the effort will help to make instruction effective for all students. It is also helpful for curriculum developers and instructors to take a learning style inventory so they are aware of their own learning style, as their preference can affect the way instruction is designed, developed, and/or implemented. Knowing their own learning preferences will help them to overcome the tendency to tailor instruction to meet their own needs. As stated earlier, it is best to choose a variety of teaching methods and media to meet the needs of as many students as possible. Dr's Bandler, R. and Grinder, J. in the Field of Neuro-Linguistic Programming categorized these different learning styles in four modalities: Students may prefer a visual (seeing), auditory (hearing), kinesthetic (moving) or tactile (touching) way of learning.

The Four Modalities:

Those who prefer a visual learning style:

1.) Look at the teacher's face intently
2.) Like looking at wall displays, books etc.
3.) Often recognize words by sight
4.) Use lists to organize their thoughts
5.) Recall information by remembering how it was set out on a page

Those who prefer an auditory learning style:

1.) Like the teacher to provide verbal instructions
2.) Like dialogues, discussions and plays
3.) Solve problems by talking about them
4.) Use rhythm and sound as memory aids

Those who prefer a kinesthetic learning style:

1.) Learn best when they are involved or active
2.) Find it difficult to sit still for long periods
3.) Use movement as a memory aid

Those who prefer a tactile way of learning:

1.) Use writing and drawing as memory aids
2.) Learn well in hands-on activities like projects and demonstrations

What teaching methods and activities suit different learning styles of the Four Modalities?

Visual

1.) Use many visuals in the classroom. For example, wall displays posters, flash cards, graphic organizers etc.

Auditory

1.) Use audio tapes and videos, storytelling, songs, jazz chants, memorization and drills
2.) Allow learners to work in pairs and small groups regularly.

Kinesthetic

1.) Use physical activities, competitions, board games, role plays etc.
2.) Intersperse activities which require students to sit quietly with activities that allow them to move around and be active

Tactile

1.) Use board and card games, demonstrations, projects, role plays etc.
2.) Use while-listening and reading activities. For example, ask students to fill in a table while listening to a talk, or to label a diagram while reading

SECTION 4

6400. HOW ADULTS LEARN

To provide effective instruction, curriculum developers must understand how adults learn. Adapting instruction to the stages of learning will improve the effectiveness of instruction and enhance knowledge transfer. To help adult students learn, instructors should: (1) put the task into context, (2) divide information into manageable chunks, and (3) afford students the opportunity to practice using new knowledge and skills.

1. Context It is very important to let students know how a task fits into the "big picture" when they begin learning. First, explain to the students how a task relates to the whole job, and then provide the details. For example, an instructor can explain the importance of preventive maintenance on a weapon (increased readiness, longer life, etc.) before teaching the details of disassembly and cleaning. This simple process orients the student to the learning, shows the relevance of a task, and prepares the student to learn.

2. Manageable Chunks Breaking information into manageable chunks means dividing the instruction into small, logical pieces and identifying the critical points. For example, when teaching preventive maintenance on a weapon, one manageable chunk of instruction would be disassembly. A critical point of disassembly is clearing the weapon. Before moving from one chunk to the next, the instructor must verify that the student understands what has been taught. The verification of understanding can be written into a lesson plan as questions or practical applications.

3. Practice The best way to learn how to do something is to do it. Once students have been introduced to a new concept or task, allow them time to practice what they have learned. As they practice, instructors stay near to assist them and coach them through the process. As they progress, instructors provide less and less assistance until students are finally able to perform the task on their own (scaffolding). The following steps describe the modeling technique:

a. Demonstrate a task at full speed.

b. Demonstrate a task slowly, emphasizing critical points.

c. Allow the students to perform the task with you.

d. Allow the students to do the task on their own.

6500. DOMAINS OF LEARNING

SECTION 5

Learning objectives can be categorized into three domains or general areas: cognitive, affective, and psychomotor. Classifying instruction into a domain allows curriculum developers and instructors to design, develop and select activities and strategies that match objectives. The ***cognitive domain*** includes all intellectual processes, from knowing to evaluating. The ***affective domain*** includes values, attitudes, beliefs, emotions, motivation, and interests. This domain includes emotional responses rather than intellectual ones; therefore, it is the most difficult to describe and assess. The ***psychomotor domain*** includes physical performance of a task. Many military training objectives are in this domain; however, all three domains of learning are usually addressed in a learning objective. For example, consider the learning objective behavior, "Clean the M-16A2." Immediately you can see that "clean" is a psychomotor skill – it is a physical performance of a task. But you must also realize that in order to clean the weapon, a Marine must know how to disassemble it (cognitive domain) and must understand the importance of maintaining the weapon (affective domain). The predominant domain is used to classify objectives. In this example, it is the psychomotor domain.

Classification schemes have been developed by educators for defining and categorizing the type of learning that occurs within each domain. These schemes or categories are referred to as taxonomies, which are organized from the simplest to the most complex. Before students can perform at the most complex level, they must master the knowledge and skills of the lower levels. This section will describe the three domains and the levels of learning for each. It will also describe how instructors and designers can use this information to maximize the effectiveness of instruction.

A simple way to remember the three domains is to use the acronym **ASK**:

Attitudes	(affective domain)
Skills	(psychomotor domain)
Knowledge	(cognitive domain)

6501. Cognitive Domain (Bloom)

Cognitive learning is demonstrated by recall of knowledge and other intellectual skills such as applying knowledge in a new situation, displaying comprehension of information, problem solving, organizing information, analyzing, synthesizing, and evaluating ideas or actions. The lower levels of this domain require a student to recall, comprehend, or apply knowledge. In the higher levels, students must analyze, synthesize or evaluate. Refer to Chapter 2, Section 2206, for the verbs that can be used for writing objectives in the cognitive domain. Figure 6-4 provides definitions and examples of the behavior for each level of the cognitive domain.

COGNITIVE DOMAIN		
Level	**Type of Learning**	**Definitions and Examples of Behavior**
6	**Evaluation**	Making judgments about the value of ideas, works, solutions, methods, materials, etc. Judgments may be either quantitative or qualitative. **Examples:** To argue, to decide, to compare, to consider, to contrast.
5	**Synthesis**	Putting together elements and parts to form a new whole. **Examples:** To write, to produce, to plan, to design, to derive, to combine.
4	**Analysis**	Breaking down material or ideas into their constituent parts and detecting the relationship of the parts and the way they are arranged. **Examples:** To distinguish, to detect, to employ, to restructure, to classify.
3	**Application**	Knowing an abstraction well enough to apply it without being prompted or without having been shown how to use it. **Examples:** To generalize, to develop, to employ, to transfer.
2	**Comprehension**	Understanding the literal message contained in a communication. **Examples:** To transform, to paraphrase, to interpret, to reorder, to infer, to conclude.
1	**Knowledge**	Remembering an idea, material, or phenomenon in a form very close to that in which it was originally encountered. **Examples:** To recall, to recognize, to acquire, to identify.

Adapted from Taxonomy of Education Objectives: Handbook I: Cognitive Domain (pp. 201-207), by B.S. Bloom (Ed.), M.D. Englehart, E.J. Furst, and D.R. Krathwohl, 1956, New York: David McKay Co.

Figure 6-4. Cognitive Domain

6502. Affective Domain (Krathwohl & Bloom)

Objectives written in this domain are intended to change attitudes that affect behavior. The Affective Domain of learning deals with learning objectives on an emotional level, to include feelings, appreciation, enthusiasm, attitudes, and motivation. Figure 6-5 provides definitions and examples of the behavior for each level of the affective domain.

AFFECTIVE DOMAIN		
Level	**Type of Learning**	**Definitions and Examples of Behavior**
5	**Characterization by Value or Value Set**	Acts consistently in accordance with the values he or she has internalized. **Examples:** To revise, to require, to be rated high in the value, to avoid, to resist, to manage, to resolve.
4	**Organization**	Relates the value to those already held and brings it into a harmonious and internally consistent philosophy. **Examples:** To discuss, to theorize, to formulate, to balance, to examine.
3	**Valuing**	Willing to be perceived by others as valuing certain ideas, materials, or phenomena. **Examples:** To increase measured proficiency in, to relinquish, to subsidize, to support, to debate.
2	**Responding**	Committed in some small measure to the ideas, materials, or phenomena involved by actively responding to them. **Examples:** To comply with, to follow, to commend, to volunteer, to spend leisure time in, to acclaim.
1	**Receiving**	Being aware of or sensitive to the existence of certain ideas, material, or phenomena and being willing to tolerate them. **Examples:** To differentiate, to accept, to listen (for), to respond to.

Adapted from Taxonomy of Education Objectives: Handbook II: Affective Domain (pp. 176- 185), by D.R. Krathwohl, B.S. Bloom, and B.B. Masia, 1964, New York: David McKay Co.

Figure 6-5. Affective Domain

6503. Psychomotor Domain (Simpson's Taxonomy)

The psychomotor domain includes physical movement, coordination, and mental skills such as speaking. This is the domain in which most Marine Corps training objectives occur. As an example, Marine Combat Training (MCT) is primarily designed to transfer physical combat skills to new Marines. Objectives in this domain require physical motion or manipulation of an object (e.g., "fire a weapon"). Some psychomotor skills are inherently more complex than others. An example is land navigation, a skill that requires more thought and planning for success than "fire a weapon." Figure 6-6 provides definitions and examples of the behavior for each level of the psychomotor domain.

PSYCHOMOTOR DOMAIN		
Level	**Type of Learning**	**Definitions and Examples of Behavior**
7	**Origination**	The ability to develop an original skill that replaces the skill as initially learned. **Examples:** Create, design, originate, arrange, compose, construct.
6	**Adaptation**	Can modify motor skills to fit a new situation. **Examples:** Adapt, change, modify, revise, alter, rearrange.
5	**Complex Overt Response**	The ability to perform the complete psychomotor skill correctly. **Examples:** Carry out, operate, perform.
4	**Mechanism**	The ability to perform a complex motor skill; the intermediate stage of learning a complex skill **Examples:** Attempt, imitate, try, assemble, build, construct, dismantle, disassemble, display, fasten, fix, mend, organize, work.
3	**Guided Response**	The early stage of learning a complex skill: includes imitation; can complete the steps involved in the skill as directed. **Examples:** Attempt, imitate, try, assemble, build, construct, dismantle, disassemble, display, fasten, fix, mend, organize, work.
2	**Set**	The readiness to act; requires the learner to demonstrate an awareness or knowledge of the behaviors needed to carry out the skill. **Examples:** Assume a position, demonstrate, show, display, move, respond, start.
1	**Perception**	The ability to use sensory cues to guide physical activity. **Examples:** Distinguish, identify, select, choose, describe, detect, isolate.

Adapted from The Classification of Educational Objectives in the Psychomotor Domain: The Psychomotor Domain. Vol. 3. Washington, DC: Gryphon House.

Figure 6-6. Psychomotor Domain

6504. USING DOMAINS OF LEARNING

The domains and levels of learning are extremely useful to the SAT process. Understanding domains can assist the curriculum developer in writing learning objectives, selecting test questions, developing lesson materials and choosing instructional methods. Instructors who comprehend the domain in which they are teaching can adopt appropriate strategies for reaching the objective.

1. Writing Learning Objectives The domains and levels of learning can be used when writing learning objective behavior statements. If students are new to the information, they must start at the lower levels of the domain. Entry-level Marines need to learn the parts of a M16A2 rifle (cognitive) prior to learning how to assemble or disassemble the rifle (psychomotor). Whether writing objective behavior statements for the cognitive domain or the psychomotor domain, the verbs used will be from the lower levels of the domain for new knowledge/tasks. Higher levels of the domain are considered when the students already have a foundation for the information/tasks. However, if new information or tasks are being taught to career or advanced level Marines, the lower levels of the domain are considered when developing the objectives. When developing the learning objectives, the verb list in Chapter 2, section 2206, can help to ensure that the appropriate level is used.

2. Tests The domains of learning can be used when deciding how to test (figure 6-7). If knowledge is being tested, then the level of the cognitive domain will indicate what type of test items are appropriate. If attitude is being tested, then the level of the affective domain will be referenced. The psychomotor domain is referenced when students are required to perform a task to a specific level of proficiency after instruction. Figure 6-7 shows the types of tests that are appropriate for each level in these domains.

3. Methods One of the factors for selecting an appropriate instructional method is the domain and level of the learning objective. When considering the method to use for a particular objective, also consider the method of testing. Methods of instruction are chosen that will enable students to perform at the specified level. For example, if students are being tested on their analytical abilities, then a case study may be an appropriate method to use in the classroom. It provides the student with practice in analyzing a real-life case, and applying rules to the scenario. Figure 6-8 provides a list of some methods that can be used to teach an objective, based on its domain and level. The list is not exhaustive, but provides many instructional methods that are appropriate.

APPROPRIATENESS OF TESTING TECHNIQUES IN COGNITIVE DOMAIN								
	KNOWLEDGE-BASED						PERFORMANCE-BASED	
LEVELS OF DOMAIN	**Multiple Choice**	**True/False**	**Matching**	**Short Answer**	**Essay Test**	**Oral Test**	**Checklist**	**Rating Scale**
Knowledge	Yes	Yes	Yes	Yes	No	No	Maybe	No
Comprehension	Yes	Yes	Yes	Yes	No	No	Maybe	No
Application	Yes	No	No	Yes	Maybe	Maybe	Maybe	Maybe
Analysis	Maybe	No	No	Maybe	Yes	Yes	No	Maybe
Synthesis	No	No	No	No	Yes	Yes	No	Maybe
Evaluation	No	No	No	No	Yes	Yes	No	Maybe
APPROPRIATENESS OF TESTING TECHNIQUES IN AFFECTIVE DOMAIN								
	KNOWLEDGE-BASED						PERFORMANCE-BASED	
LEVELS OF DOMAIN	**Multiple Choice**	**True/False**	**Matching**	**Short Answer**	**Essay Test**	**Oral Test**	**Checklist**	**Rating Scale**
Receiving	Yes	Maybe	Maybe	Yes	No	No	Yes	No
Responding	Yes	No	No	Maybe	Maybe	Maybe	Yes	No
Valuing	Maybe	No	No	No	Yes	Yes	Yes	Yes
Organization	No	No	No	No	Yes	Yes	No	Yes
Characterization	No	No	No	No	Yes	Yes	No	Yes
APPROPRIATENESS OF TESTING TECHNIQUES IN PSYCHOMOTOR DOMAIN								
	KNOWLEDGE-BASED						PERFORMANCE-BASED	
LEVELS OF DOMAIN	**Multiple Choice**	**True/False**	**Matching**	**Short Answer**	**Essay Test**	**Oral Test**	**Checklist**	**Rating Scale**
Perception	No	No	No	No	No	No	Maybe	Maybe
Set	No	No	No	No	No	No	Maybe	Maybe
Guided Response	No	No	No	No	No	Maybe	Maybe	Maybe
Mechanism	No	No	No	No	No	Maybe	Maybe	Maybe
Complex Overt Response	No	No	No	No	No	Maybe	Maybe	Yes
Adaptation	No	No	No	No	No	Maybe	No	Yes
Origination	No	No	No	No	No	Maybe	No	Yes

Yes = Appropriate Maybe = Can be Appropriate in Some Situations No = Never Appropriate

Adapted from Planning Instruction for Adult Learners By P. Cranton, 1989, Toronto, Ontario: Wall & Emerson, Inc.

Figure 6-7. Using Domains to Determine Test Item Type.

Domain	Level of Learning	Most Appropriate Methods
COGNITIVE DOMAIN	**KNOWLEDGE**	Lecture, Programmed Instruction, Drill and Practice
	COMPREHENSION	Lecture, Modularized Instruction, Programmed Instruction
	APPLICATION	Discussion, Simulations and Games, CAI, Modularized Instruction, Field Experience, Laboratory
	ANALYSIS	Discussion, Independent/Group Projects, Simulations, Field Experience, Role Playing, Laboratory
	SYNTHESIS	Independent/Group Projects, Field Experience, Role Playing, Laboratory
	EVALUATION	Independent/Group Projects, Field Experience, Laboratory
AFFECTIVE DOMAIN	**RECEIVING**	Lecture, Discussion, Modularized Instruction, Field Experience
	RESPONDING	Discussion, Simulations, Modularized Instruction, Role-Playing, Field Experience
	VALUING	Discussion, Independent/Group Projects, Simulations, Role-Playing, Field Experience
	ORGANIZATION	Discussion, Independent/Group Projects, Field Experience
	CHARACTERIZATION BY A VALUE	Independent Projects, Field Experience
PSYCHO-MOTOR DOMAIN	**PERCEPTION**	Demonstration (lecture), Drill and Practice
	SET	Demonstration (lecture), Drill and Practice
	GUIDED RESPONSE	Peer Teaching, Games, Role-Playing, Field Experience, Drill and Practice
	MECHANISM	Games, Role-Playing, Field Experience, Drill and Practice
	COMPLEX OVERT RESPONSE	Games, Field Experience
	ADAPTATION	Independent Projects, Games, Field Experience
	ORIGINATION	Independent Projects, Games, Field Experience

Figure 6-8. Using Domains to Determine Method of Instruction

SECTION 6

6600. GROUP DYNAMICS

Problem solving exercises, practical applications, and classroom layouts are frequently designed for small group work. Using small groups in the learning process allows experiences to be shared, tasks to be performed, and productive relationships to be established. In many cases, groups help reduce anxiety and increase learning for individuals. Individuals generally prefer to work in smaller groups (3-4 participants). Individual participation tends to decrease with increasing group size – a group leader is more likely to emerge and individuals are likely to conform to the majority opinion. The learner with more experience related to the task tends to make more contributions and to have more influence on the group.

1. Handling Group Disruption Though groups can be effective, there are times when a group member hinders others from learning. This may be through over-aggressiveness, lack of participation, negative attitude, or anxiety. Regardless of the behavior, the method of dealing with the behavior is the same. The instructor must first identify the problem behavior and then privately address the problem with the individual. Problems should be addressed with understanding and directness (focus on the problem behavior, not the personality), and a solution should be offered. The instructor and learner can set goals to eliminate the problem behavior for the next group session. Assigning roles to each member of the group is often an effective way to avoid or eliminate problems.

2. Handling Lack of Progress A prime problem with group work is the amount of time that can be spent off task. As the group members build relationships, the discussions often digress. There are several methods instructors can use to ensure all members contribute and that the group stays on task:

a. Have group members conduct an evaluation of how well the group, and individuals within the group, are progressing towards their goal. Provide members with a rubric for the evaluation. The results will assist you with your assessment of the learners as well as provide feedback to the group so they can work on any deficiencies.

b. Structure group activities. This can be done through time constraints, assigning roles (e.g., leader, reporter, briefer), providing a specific structure for the activity, or by limiting the number of tasks to be accomplished at one time. For example, if a group must complete 3 tasks that should take about 10 minutes each, assign them individually. Allow students 10 minutes to complete the first task. That task can be discussed, if necessary, and a new task assigned with a new time constraint. This will help students stay focused. The curriculum developer must make instructor notes in the lesson plan. If instructors format the class to accommodate group behavior, then they must note the changes in the After Instruction Report. A permanent change to the lesson plan may need to be made.

c. Reassigning groups may be considered, but should be avoided if possible. This decision should be carefully considered after other remedies have been exhausted, and should be evaluated for the possible negative consequences.

3. Working With Resistant Learners There are many reasons why learners may resist training. Regardless, instructors must be able to deal with them as adults. Below is a list of some common reasons why adults resist training:

a. Unsuccessful in previous learning environments.

b. Hard time adapting to change. **(Learning is change.)**

c. Unsure of the expectations.

d. Individual learning styles may be different than instructors' styles.

e. The individual may see the class or activities as irrelevant to him/her.

f. Knowledge/Skills are new and the learner does not want to appear ignorant or incapable.

g. Learning level may be inappropriate for the individual.

Instructors will, at times, encounter resistant adult learners. However, an effective instructor can deal with resistant learners by involving them in the learning process, providing feedback, and encouraging peer interactions. It is up to the instructor to create an environment conducive to learning, to clarify what is expected, to provide authentic activities, and to create an atmosphere that allows the students to make their experiences part of the instructional setting. Sometimes, students' prior experiences will hinder their progress. For example, in a career level course, students may have been taught how to perform a task differently in the Operating Forces than what is taught at the school. This may be a source of frustration for the student, and the instructor must be prepared to provide reasoning for the method taught in the course. The instructor must strive to establish his or her credibility early as the subject matter expert to deal effectively with adult learners.

SECTION 7

6700. MOTIVATION

Students must be motivated to learn for learning to be effective. Curriculum developers can plan motivational activities for the instructor. However, there is a shared responsibility for motivation between the instructor and the student. The learner controls the desire to learn and the instructor controls the stimulation. Below are some ways that instructors can stimulate motivation.

1. Give Recognition When students do something worthy of recognition, instructors need to give positive feedback. Such recognition makes the student feel that his or her contribution to learning is significant. Recognition can encourage further participation and enhance learning.

2. Serve as a Good Model Instructors have a considerable influence on student motivation. **As an instructor, you are the model to be emulated**: your uniform, treatment of students, demonstration of desired behavior and your enthusiasm must be beyond reproach. Research indicates that teachers with low self-esteem tend to have students with lower self-esteem.

3. Stimulate Cooperation Among Students Society places a great deal of emphasis on competition, and Marines tend to be competitive by nature. While competition among students can lead to improved performance, it can also cause stress and poor performance for those students that cannot keep up. When students compete with a standard, rather than with each other, all students can experience success. While learners must accomplish some objectives individually, working in cooperative, collaborative teams (when and where it is appropriate) ensures success for all.

4. Consider Mastery Learning Mastery is defined in terms of a specific set of objectives that students are expected to meet. When using this approach, student performance is measured against objectives, not against the performance of other students.

5. Have High but Reasonable Expectations There is a considerable amount of research that suggests students will perform up to the expectations that instructors have for them. Marines expect training to present a challenge. When the standard for performance is high, students will be motivated to reach that level. Ensure the challenge is not beyond the abilities of your students. Consider what has been taught, the amount of practice allowed, and the environment in which the student must perform. Most students who put forth effort can meet high, but reasonable, expectations. A few will find the task simple, while some will find it too difficult. Success will come at various paces, but will come to most of the students with the guidance of a patient, understanding instructor.

6. Recognize Potential in Students Behavioral scientists have concluded that human's function at 10 percent or less of their potential. Negative self-esteem can stifle the potential of students. Instructors who recognize true potential in students that are struggling can motivate them to continue by recognizing prior successes. For example, a rifle range coach can quickly point out marksmanship fundamentals that a shooter is properly applying before correcting the shooter's problems. When students know that their instructors see potential for success, they are motivated to meet the instructors' expectations.

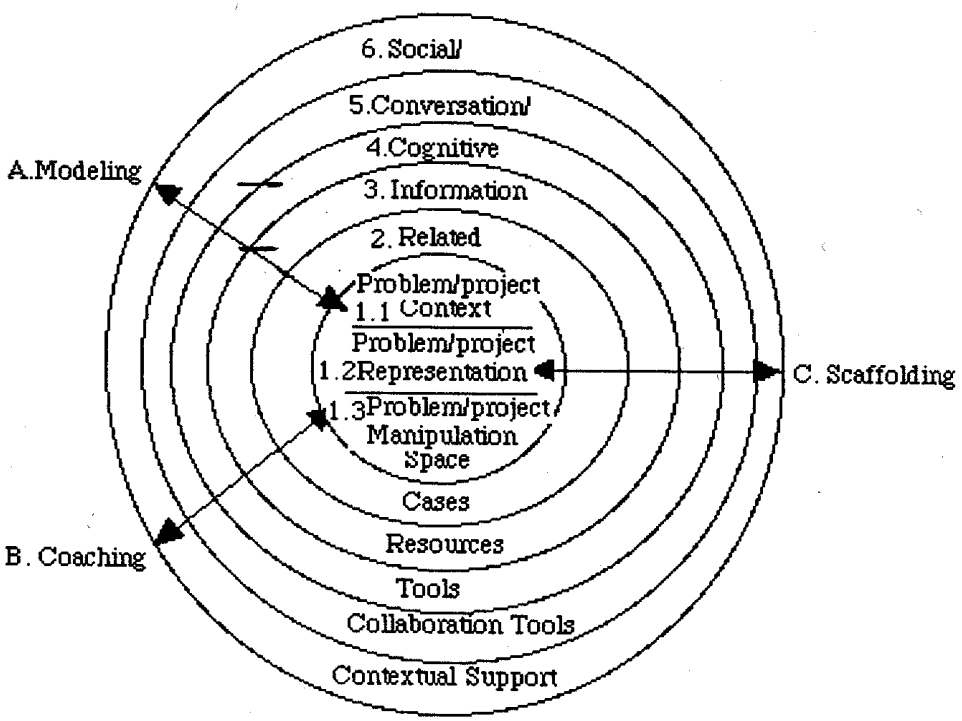
SECTION 8

6800. CONSTRUCTIVIST LEARNING ENVIRONMENTS (CLEs)

Until recently, most instructional design efforts were based on objectivist conceptions of learning, which assume that knowledge can be transferred from teachers or transmitted by technologies and acquired by learners. Constructivist conceptions of learning, by contrast, assume that knowledge is individually constructed and socially co-constructed by learners based on their interpretations of experiences in the world. Constructivist Learning Environments (CLEs) are an attempt by instructional designers to build environments that allow students to explore, and discover meaning for themselves, in a specified domain. This chapter will highlight the key components of a CLE and present some examples of various kinds of CLEs. This information is essential for Marines involved in designing instruction for advanced schools and senior Marines.

6801. Designing CLEs

The model for designing CLEs (Figure 8-1) illustrates their essential components. The model conceives of a problem, question, or project as the focus of the environment, with various interpretative and intellectual support systems surrounding it. The goal of the learner is to interpret and solve the problem or complete the project.



Adapted from Designing Constructivist Learning Environments, D. Jonassen, 2002, Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Figure 8-1. Model for designing CLEs

6802. The Problem

Since the key to meaningful learning is ownership of the problem or learning goal, you must provide interesting, relevant, and engaging problems to solve. The problem should be ill-structured or ill-defined, so that some aspects of the problem are embedded within the problem and must be discovered by the learners. Here are some key aspects of ill-structured problems:

- Unstated goals and constraints
- Multiple solutions, solution paths, or no solutions at all
- Multiple criteria for evaluating solutions
- Present uncertainty about which concepts, rules and principles for the solution or how they are organized
- Provide no general rules for predicting the outcome of most cases
- Require learners to make judgments about the problem and to defend their judgments by expressing personal opinions or beliefs (Jonassen).

Additionally, problems need to include three integrated components: the problem context, the problem representation or simulation, and the problem manipulation space (the environment in which the students will work towards their solution). The context refers to the physical, organizational, and socio-cultural atmosphere in which problems occur. The problem representation/simulation must be interesting, appealing, and engaging; but perhaps most importantly, it must be authentic. Authentic means that learners should engage in activities that present the same type of cognitive challenges as those in the real world, that is, tasks that replicate the particular activity structures (goals of the activity, physical setting that constrains/fosters certain actions, and the tools required) of a context (Savery & Duffy, 1996). Other key elements of CLEs (Figure 8.1) are access to ample, pertinent resources; the use of collaboration/corroboration between students and instructors; and a student-centered atmosphere where the instructor facilitates student learning through the use of modeling, coaching, and scaffolding.

6803. Examples of CLEs

This section provides just a few examples of the vast array of Constructivist Learning Environments. The goal is to stimulate your curiosity and to encourage you to explore the many available resources in this area so you can create a learning environment that best suits the needs of your students.

1. Situated Learning or Anchored Instruction Situated learning promotes authentic activities to ensure that learning is situated in contexts that reflect the way the knowledge will be useful in real-life situations. Situated learning environments provide instruction through the exploration of authentic scenarios, cases, or problems that allow students to experience the complexity and ambiguity of the real world with out real-world consequences. Learners work in small groups while the teacher provides structures collaborative activities, learning resources, and instructional support.

Instructional characteristics of situated learning environments:

- Promote authentic learning through coherent, meaningful, and purposeful activities that represent the ordinary practices in real-life situations and contexts.
- Provide opportunities for learners to internalize learning and develop self-monitoring and self-correcting skills.
- Support exploration and interaction within a real-world context.
- Provide multiple perspectives through the different roles depicted in the scenario and the different strategies presented by individuals and groups.
- Promote articulation, reflection, and critical thinking skills (decision making and problem solving).
- Student-centered: Teacher asks questions, facilitates discussions, provides resources and encourages critical thinking, but does not provide solutions or impose procedures.

2. Problem-Based Learning Problem-Based Learning engages the learner in a complex problem-solving activity in which the problem drives all learning. No prior learning is assumed. Learning begins with a complex, ill-structured, real-world problem to be solved, rather than content to be mastered. Students, in groups of 4-6, take ownership of the problem and construct their own understanding of the situation by identifying what the problem is, identifying learning needs, determining a plan of action, and eventually finding a sensible, workable solution. Tutors or teachers are assigned to each group to act as mentors and coaches, facilitating the problem-solving process and providing appropriate resources. The primary goals of Problem-Based Learning are to help students develop collaborative learning skills, reasoning skills, and self-directed learning strategies.

Instructional characteristics of Problem-Based Learning:

- Promote ownership of the learning process (the context motivates students to "own" the problem, students must define the problem).
- Assumes no prior knowledge in the content area(s) for which the problem is intended.
- Promote student-centered, group learning environment and self-directed learning (students must set their own learning goals, generate hypotheses, develop strategies, and search for/identify relevant resources to accomplish goals).
- Promote authentic learning through real-world, ill-structured problems (multiple solutions and solution paths).
- Problem solving as primary learning goal; self-reflection primary assessment.
- Support recursive, iterative cycling through a reasoning process to reach goal.
- Allows learners to integrate, use, and re-use newly learned information in context.
- Promote facilitation and scaffolding through instructor guidance.

3. Cognitive Apprenticeship Cognitive apprenticeship is very much like situated learning. The key difference is that in a cognitive apprenticeship, learners are invited into the actual practices of a knowledge domain and are asked to perform these practices as an apprentice or intern. Students interact with experts who model and explain what strategies are being used in solving problems in their domain of knowledge. This is very much like the military' s practice of on-the-job training.

Instructional characteristics of cognitive apprenticeships:

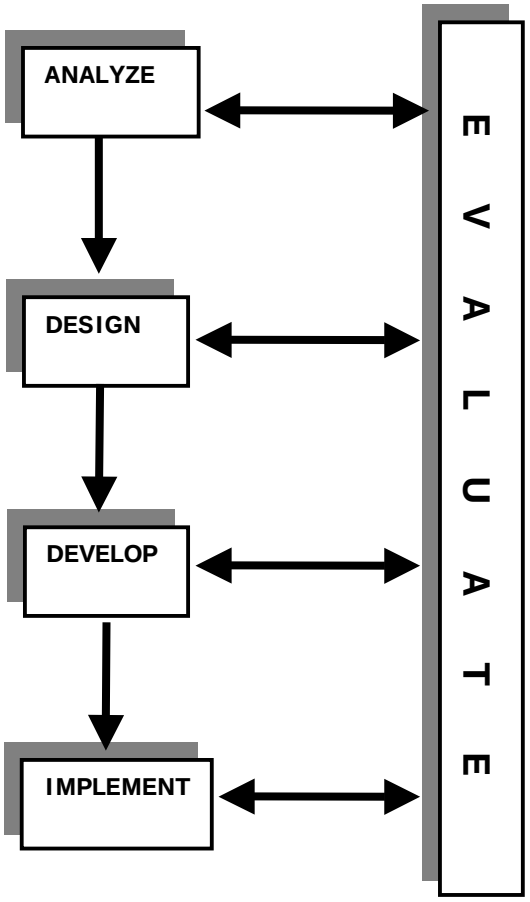
- Promote mentoring and coaching relationship between novice learner and expert practitioner.
- Support modeling and explaining of expert performance (teacher models activity by making tacit knowledge explicit through think aloud procedures and worked examples).
- Focus on mastery of performance within the context of the knowledge domain.
- Encourage collaborative learning such as collective problem solving, developing teamwork skills, experiencing multiple roles, and confronting misconceptions.
- Support learning strategies such as articulation of understanding and reflection on performance.
- Promote the enculturation of students into authentic practices through activity and social interaction (apprentice-type learning, introducing students into the community of practice).

(Note: The information in this section was collected from a variety of sources, to include Chapter 5, Pedagogical Models for Online Learning, from an unpublished manuscript by Dr. Nada Dabaugh, George Mason University)

4. Conclusion The constraints of this manual allowed for the explanation of just a few models of constructivist learning environments. As the developers of educational programs and learning environments for Marines, we must take the time to explore all of the learning environments available. By building our understanding, we will be better able to provide effective instruction. Below is a list of other constructivist learning environments that can be further researched at the Theory Into Practice Database: tip.psychology.org.

Cognitive Flexibility Hypertexts
Communities of Practice/Learning Communities
Computer Supported Intentional Learning Environments (CSILEs)
Microworlds, Simulations, Virtual Worlds

SCHOOL ADMINISTRATION



In Chapter 7:

Chapter 7

7000. INTRODUCTION

Computer-based management systems are used in the Marine Corps to assist the formal schools/detachments and operational forces in tracking training, identifying quotas, assigning seats, managing formal school curriculum, and performing student administration. Three key systems within the Training Information Management System (TIMS) are Training Requirements and Resources Management System (TRRMS), By Name Assignment (BNA), and Marine Corps Automated Instructional Management System (MCAIMS). Administrators in the formal school/detachment must be aware of the functions and uses of each of these systems. Additionally, the chapter provides administrators with the importance, development steps, and the rewards gained by a school that implements a well thought-out staff and faculty development plan.

7100. TRAINING INFORMATION MANAGEMENT SYSTEM (TIMS)

SECTION 1

TIMS (https://tims.tecom.usmc.mil/) is a system maintained by Formal Schools Training Branch, that training information to the individual Marine and command training chiefs, feedback opportunities for users of the training information systems, status of ongoing projects for training information systems, a link to 3270 for BNA access, and general user information. TIMS is made up of three main systems: Training Requirement Resource Management System (TRRMS), Marine Corps Automated Instructional Management System (MCAIMS), and By Name Assignment (BNA). Each of these systems is discussed in more detail below.

1. Training Requirement Resource Management System (TRRMS) The relational database that produces the TIP and TQM. It is also the primary source of data for developing the POM and future budget submission for formal training. TRRMS is also used to develop and report the Marine Corps portion of the Military Manpower Training Report (MMTR) to the Department of Defense (DOD) and the Institutional Training Readiness Report to the Congress. The two main components of TRRMS are Training Input Plan (TIP) and Training Quota Memorandum.

a. **Training Input Plan (TIP)** The TIP is produced in relation to the Fiscal Year (FY) - 1 October to 30 September XX - and covers one year for execution and four "out years" for planning. Only approved Formal Courses of Instruction are included. In general, the TIP represents centrally controlled training courses that lead to an MOS, provide MOS-related skills, or which are deemed relevant to the overall Marine Corps mission.

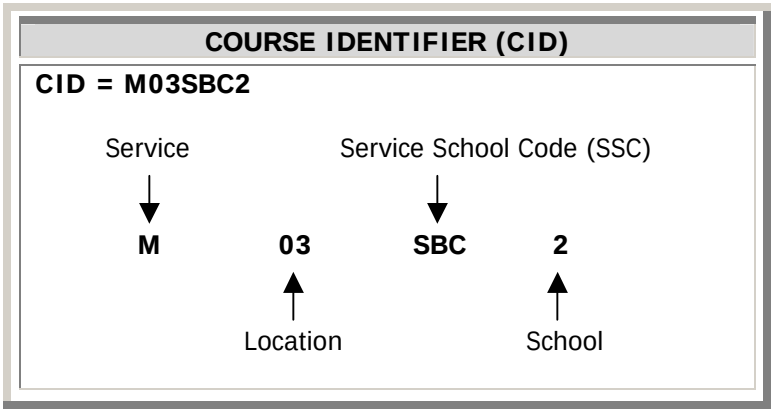
1) **Components of the TIP** The combined TIP is composed of a cover letter from the Commander Training Command, a TIP/TQM Reference Guide, the MOS Training Tracks, the FY XXXX-XXXX Requirements Plan, and Appendices. The cover letter provides information and guidance for commands and schoolhouses, and it solicits feedback, correction, and course scheduling information. The MOS Training Tracks consist of the approved course(s) required to obtain the given MOS in accordance with the MOS Manual and Individual Training Standards (ITSs)/Training and Readiness (T&Rs). The most substantive section of the TIP deals with the FY XXXX-XXXX plan. This section is presented in two formats on the CD ROM. One format is organized by Service (Army, Navy, Air Force, Marine Corps, Civilian) and the other by Sponsor (i.e., MPP-20, C473, POE-21). All courses are listed by Course Identifier (CID), the schoolhouse number, and service school code (SSC). The following appendices are also included for reference purposes: 1) Sponsor Codes, 2) MOS List, 3) School Codes/Locations, and 4) Student Type Codes. The CD ROM also includes a Course List sorted alphanumerically by the CID for easy reference. The only means of accessing the TIP is via TRRMS. The TIP can be viewed online.

2) **Cycle of the TIP** The TIP is produced annually in May for the upcoming fiscal year and four out-years. First the training tracks are routed for updating. Then the worksheets are routed to the OccFld sponsor for non-MOS training requirements. Manpower Plans and Policies (MPP) produces the Manpower TIP based on the latest Grade Adjusted Recapitulation (GAR). These inputs are entered into the Training Requirements and Resource Management System (TRRMS), which is a computer-based model for development of the TIP. TRRMS provides automation of the numerical decision making process and provides analysis for resolving conflicts and shortfalls. It also does training/workload calculations and budget costing for planning. After the TIP is produced, it is routed for comment and appropriate adjustments are made before final publication and distribution. Once published, the TIP acts as the source document for assignment of students through the Training Quota Memorandum (TQM) process.

3) **Reading the TIP** Along with course dates, alphanumeric codes are used in the TIP to identify the course and the student type.

   a) **Course Identifier (CID)** The Course Identifier (CID) is a unique alphanumeric code composed of several identifying elements: Service, Location, Service School Code (SSC), and the School. There is a table in front of each TIP, which breaks down the service and location codes. Figure 7-1 identifies the information provided by the seven-character alphanumeric known as the CID.

Figure 7-1. Course Identifier (CID)



b) **Student Type** Training requirements and seat assignments are broken down into various student categories. Each student type is a two to five character alphanumeric code, indicating status, whether Enlisted, Officer, or Warrant Officer, and special type. There is a table in front of each TIP that breaks down the Student Type Codes. Figure 7-2 identifies what the three-character alphanumeric code means.

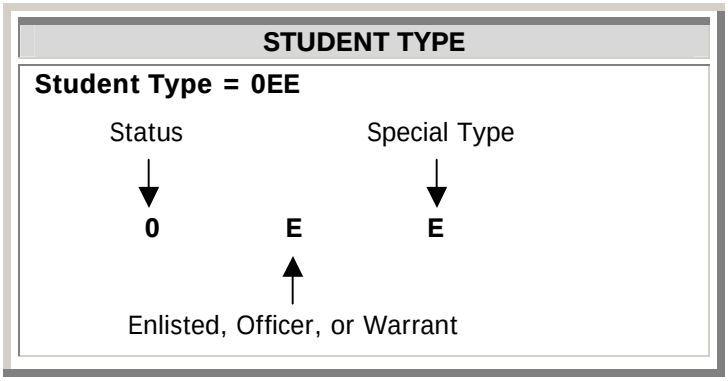
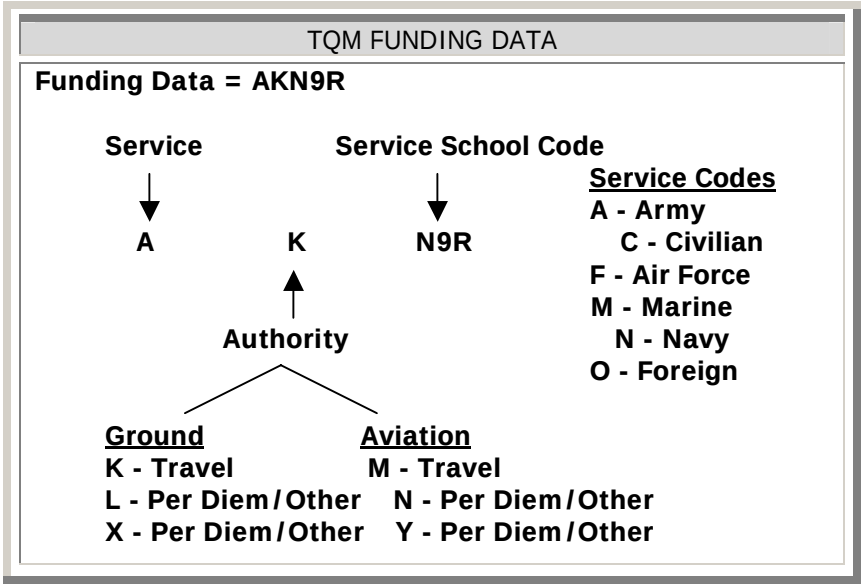


Figure 7-2. Student Type.

b. **Training Quota Memorandum (TQM)** Training Quota Memorandum (TQM) are documents produced to translate annual TIP requirements into actual class seat assignments and form the basis for order writing. They cite funding authority for travel and per diem while providing a breakdown of seats by student type. A TQM is produced for each course on the TIP.

1) **Components of TQM** A TQM is comprised of a cover letter and an enclosure. The cover letter provides execution instructions in several standard paragraphs. The first paragraph requests the ordering of students to school. The second paragraph provides funding data in the form of a five-character alphanumeric field to identify the service, the course, and the authorization. Figure 7-3 identifies the meaning of the alphanumeric code. The third paragraph contains special instructions provided by the school or the OccFld sponsor, if applicable. This is followed by a paragraph containing prerequisites provided by the MOS Manual, the school, or the OccFld sponsor. Next comes a paragraph of administrative instructions. Then a paragraph listing class capacity obtained from the Course Descriptive Data (CDD). If revisions have been made to the TQM, a justification paragraph will be included to describe what caused the revision. The enclosure to the TQM is the actual breakdown of class schedule and seat allocations by student type or command.

Figure 7-3. TQM Funding Data.



2) **Cycle of the TQM** TQMs are produced annually in consonance with the fiscal year and are revised as necessary to reflect schedule changes, seat allocations and other changes. In most cases, TQMs are produced at least 60 days prior to the first class; however, some revisions require short-fused telephonic coordination.

2. By Name Assignment (BNA) The BNA system is the Marine Corps' Class I system used to collect enrollment, graduation, and non-graduation training data. BNA is used to track Marine Corps sponsored students through their training pipeline. It provides training seat coordination among the various personnel assignment agencies and aids in evaluating annual training plan performance. MCO 1553.7 mandates BNA as the official training reservation and reporting system of the Marine Corps. The order directs reporting of student enrollment, completion status, and class validation in BNA. The BNA User's Manual can be downloaded or viewed on-line. It is suggested that anyone who uses BNA on a regular basis download the user's manual and print it as a reference.

a. **Impact of BNA** BNA lists all formal training opportunities in the Marine Corps. It provides the user with a roster and other reports. BNA interfaces with many USMC systems and other service training systems as indicated in Figure 7-4 and Figure 7-5. Data from BNA is reported to a variety of agencies, including DoD and Congress through the Military Manpower Training Report (MMTR) and the Institutional Training Readiness Report (ITRR). The MMTR reports to Congress all formal training of Marines conducted at each school for all the services. This report has to match budget and manpower reports. The ITRR identifies to Congress all formal training conducted at USMC schools.

USMC Systems Interfaced With By BNA
▪ **Marine Corps Total Forces System (MCTFS)** - single source for USMC student information ▪ **Recruit Distribution Model (RDM**) - Schedules initial MOS training ▪ **Unit Diary/Marine Integrated Personnel System (UD/MIPS)** - Schedules recruit training & MCT ▪ **Automated Orders Writing Process (AOWP)** - Orders have class dates and course information ▪ **Training Requirements and Resource Management System (TRRMS)** - Quota Management ▪ **Marine Corps Automated Instructional Management System (MCAIMS)** - student progress and rosters ▪ **Reserve Affairs Personnel Entry Level Assignment System (RAPELLA)** - Schedules training for resources

Figure 7-4. USMC Systems Interfaced With By BNA.

Other Service Training Systems Interfaced With By BNA
▪ **United States Navy** - Navy Integrated Training Administrative System (NITRAS) ▪ **United States Army** - Army Training Requirements and Reserve System (ATRRS) ▪ **United States Air Force** - Air Force Military Modernization Program/Oracle Training Administration (MILMOD/OTA)

Figure 7-5. Other Service Training Systems Interfaced With By BNA.

b. **Process of BNA** BNA is loaded with students by monitors and using units. It monitors school throughput and unfilled quotas. The information produced by BNA impacts the budget, quotas, and the schedules of courses. Proper and timely class validation triggers BNA to send an Administration Instruction Manpower Management System (AIMMS) transaction to Marine Corps Total Force System (MCTFS) to update the Marines' Basic Training Record (BTR). A transaction is sent to the Sailor Marine Academic Record Transcript (SMART) to update the civilian equivalency transcript of a Marine for courses completed at formal schools.

3. Marine Corps Automated Instructional Management System (MCAIMS)

The Marine Corps is using the TECOM Integrated Management System (TIMS) which is a government-owned software application that is available for use throughout the Marine Corps. TIMS is the Marine Corps' standard automated system for instructional management and school administration. All Course Descriptive Data (CDD) and Programs of Instruction (POI) must be produced and submitted using TIMS. For maximum effectiveness and flexibility, TIMS is operated and supported at individual formal schools/detachments. School administrators rely on MCAIMS to manage students, instructors, resources, reporting requirements, etc. Instructional staff members (curriculum developers, instructors, testing officers, etc.) use TIMS as a tool for automating key functions of the Design, Development, Implementation, and Evaluation phases of SAT. Refer to the TIMS help screens for more information and guidance.

SECTION 2

7200. STAFF AND FACULTY DEVELOPMENT

Staff/Faculty are those individuals who directly or indirectly contribute to the primary mission of the school. A school staff encompasses the instructors, curriculum developers, instructional systems designers, Academic Chief and Officers, Executive Officers, Commanding Officers, secretary, the clerk that does BNA, and the Information Systems Coordinator (ISC). This list is by no means exhaustive and can encompass a myriad of other personnel depending on the mission of the school. In order to foster continuous improvement in the school, the development of faculty/staff needs to be considered and planned. Needs may be specific to instruction, curriculum development, administration, or within the occupational specialty.

7201. PURPOSE

Over the past few years, a number of factors created the emergence of the movement towards staff development. Some of these factors include the diverse student population, demands for accountability, and the information/technology explosion. More and more institutions of learning are becoming aware of the direct positive correlation between effective faculty development programs and improved student performance. The benefits realized from staff development are not solely limited to student outcomes; a good plan can also bring about organizational growth. The purpose of having a staff/faculty development plan or program is to impact the following areas:

Curriculum Implementation
Instructional Improvement
Professional Development
School/Organizational Development

1. Curriculum Implementation The staff/faculty plan needs to be designed to influence curriculum implementation by increasing the knowledge-base within the subject area, providing diversification and exposure, providing a buy-in to new program objectives, and supporting the ability to model any new initiatives. Staff/Faculty can be exposed to a variety of mechanisms that can be used to increase transfer of learning. Developing staff/faculty also increases the cooperation in the implementation of essential programs for improving curriculum. Take for instance, if the school is experimenting with writing new instructional strategies into the curriculum to increase transfer of learning, staff/faculty will be more supportive if they have been educated and sold on its effectiveness. Through a well-developed staff/faculty, the staff/faculty is provided the training and education to successfully model implementation of new programs and they are prepared to coach for technical support when problems arise in implementation.

2. Instructional Improvement The staff/faculty development plan needs to provide the instructional staff with the means of improving the technical skills for teaching, exposure to the different range of instructional strategies to use, and ways to develop their individual strengths within instruction. Individual strengths can be used through out the staff/faculty to build the competencies of others. This team orientation of staff/faculty assisting and grooming staff/faculty develops collaborative structures and supportive working relationships.

3. Professional Development The staff/faculty development plan needs to contribute to professional development by establishing norms of continuous adult learning, experimentation, openness to new ideas, and feedback. It is best if the plan encourages responsible, autonomous decisions reflecting school goals, values, and student-centered instruction. Professional development contributes to the ability to develop skills of reflective self-analysis, self-assessment, and goal setting for improvement. By implementing a plan that fosters and supports continuous improvement and a focused mission, the school is able to build a collaborative work culture. Effectiveness will be apparent in the school's product.

4. School/Organizational Development On a grander scale, the staff/faculty development plan creates clarity, integration and commitment to goals at all levels. It improves the quality of interactions and relationships in the school and organization improving effectiveness. The plan needs to be developed with an overall objective of improving the professional work climate and advocating structures that facilitate improvement. For example, a plan that represents training practices that advocate "we" versus "they" would be counter-productive. The plan needs to unify staff/faculty toward the mission. Any dysfunctional structures and/or practices must be eliminated. With every section of the plan, there should be a mechanism in the design to provide feedback for renewal. The outcomes of the staff/faculty development plan must be reviewed and evaluated as to whether the desired outcomes are being achieved.

7202. ELEMENTS OF A STAFF AND FACULTY DEVELOPMENT PLAN

Before developing a plan, it is important to note that the plan or program adopted must address the development of all staff members within the organization. Additionally, it should also be flexible enough to be tailored to each individual. An effective staff development plan should consider and include the following elements:

1. Training Policy/Mission Statement
2. Job Definition of Staff/Faculty
3. Staff Certification/Training Continuum
4. Levels of Competencies for Each Job/Billet During Assignment
5. Staff Recognition

This list is by no means exhaustive of what can and should be addressed in a staff development plan. However, it is reflective of some of the more significant considerations in devising a plan. Most importantly, an effective plan should take into account the nature of adults as learners (see Chapter 6, Adult Learning), the importance of making development options accessible to them, while allowing them to take responsibility for their own learning. The goal is to create a facilitative, collaborative environment, where staff has a sense of freedom and opportunity to grow, experiment, and take risks.

1. TRAINING POLICY/MISSION STATEMENT This should state the scope of the schools charter. The extent of the school's mission, and how the staff and faculty development plan supports it, will determine what is included in this section of the plan. This mission statement should also include goals of the development plan as they pertain to professional growth.

2. JOB DEFINITION OF STAFF/FACULTY In order to develop a plan for each member of the school's staff, their role/roles must be clearly defined. If performance requirements and job criteria, knowledge, skills and characteristics required to optimally perform on the job are clear, then both leaders and their staff have an undisputable basis for establishing performance expectation. If the scope of the job is clear, it also provides clarity as to how and if the job relates to organizational goals. If the school has curriculum developers, instructors, and administrators, Marines or civilians, their position description or scope of duties must be clearly articulated to them and in writing. Collateral duties must be included in the job definition as required. Figure 7-6 provides an example of a job definition.

Figure 7-6. Sample Job Definition.

Course Manager – Personnel responsible for training in a specific course or for specific areas of training in several courses. Examples include Chief Instructors, Program of Instruction (POI) Manager or Instructional Systems Specialist. It is the job of the course manager to ensure that policy provided by the training manager and higher authority is carried out at the course level. The duties of the course manager include:

- Coordinates the training program for all assigned personnel and maintains instructor training records.
- Conducts scheduled and unscheduled instructor evaluations.
- Manages the instructor certification program and coordinates instructor of the quarter certification.
- Compiles evaluation and course feedback from both student and instructors and provides to Academics Officer and Director.

3. STAFF CERTIFICATION/TRAINING CONTINUUM Staff certification outlines the training tracks, requirement, and certification procedures for the school's staff, both military and civilian. It states how the training requirements will be accomplished and the timeframe for completion. The selected training should enable selected personnel to work independently to stay current in the duties of the assigned position. It is here the Instructor, Curriculum Developer, or Administrator's Training and Qualification Process are outlined.

4. COMPETENCIES Significant creativity and thought is required to be able to define the levels of competencies expected by personnel from the time that they are assigned to each billet to the end of their assignment in a formal school/detachment. However, it is important for personnel to understand the expectations and how those expectations increase with experience and time in a billet. While it is easy to define the instructor training requirement, which some schools implement in the form of a Master Instructor and Instructor of the Year Orders, it is more difficult to define the requirements for those who function strictly as curriculum developers or administrators.

5. STAFF RECOGNITION This section of the plan should identify what constitutes certification. Once the levels of competencies are met, how will they be documented? Will the individual gain an entry in their instructor folder or service record book?

7203. ADDITIONAL ELEMENTS/ CONSIDERATIONS

It is recommended that when considering implementing or revising a staff development program, examine how well the above elements are addressed. It is also important to consider that the program is being developed for adults who have a wealth of experience, which can impact the extent of their participation in faculty development. Any faculty development program should have a "What's In It For Me" (WIFFM) for the participants.

The plan needs to be developed based upon the average individual that arrives at your school. It should outline a development program for an individual from the day he/she arrives to the day he/she leaves. At times, a new person with prior experience may not require the first year of training as defined in the school's plan. The opposite can also be true where an individual needs in excess of what has been defined in the plan to get him/ her to where he/she needs to be.

1. MENTORSHIP/COACHING This addresses the need for assigning new individuals to a master or experienced individual to effectively assist/guide the less experienced in working in the formal schools. This mentor would perform a myriad of roles, primarily aimed at assisting the new member in dealing with issues related to teaching and other aspects of the new environment.

2. OVER-ARCHING GOAL OF THE PLAN It is important that the content of the plan is aimed at developing specific skills related to the job. It is also imperative that the plan reflects clear organizational and operational objectives. There needs to be a clear definition of how the participants will use the new information they have acquired, and it must fit in with the organizational goals. Sending staff to classes to learn just in case they need the information is not a good use of resources. For example, sending an instructor to Navy Interactive Courseware Development and Multimedia Tool Book is not a good idea unless this person will be performing a task specific to the training in the immediate future.

3. OWNERSHIP OF DEVELOPMENT EXPERIENCES This addresses the actual types of the staff development activities. Here are some considerations in assisting this process.

a. Ensure content of plan is presented in a variety of modes and activities.
b. When new information is provided, demonstrate application for current use, reinforce new information and provide feedback.
c. Provide opportunities to practice/experiment-learned information in a non-threatening environment.
d. Provide coaching/mentoring - opportunity to learn from others.

4. REWARDS EXCELLENCE This is an often overlooked and essential element of a development program. It should be examined carefully to find creative ways to reward those on your staff who, through their own initiative, meet and exceed the staff development criteria.

7204. STAFF CERTIFICATION POLICY

As discussed earlier, staff certification requirements must be clearly detailed in the plan. When tailoring the plan for staff members, it is essential that the individual development take place in more than one incident. The plan must cover the duration that staff member will be assigned to that position or school. It should ensure opportunities for development takes place often enough, with the goal of ensuring that the participants progressively gain knowledge, skill, and confidence. Even with a plan in place, as training managers, we need to identify our staff's potential and performance and determine if the plan in place should be personalized based on skills or lack thereof for specific individuals.

1. ACTIONS BASED UPON PERFORMANCE/POTENTIAL Based upon personnel's performance and potential, administrators must be prepared to take actions to maintain or increase the level of performance. Below is a list of ways to encourage improvement and motivate personnel to exceed expectations.

High Performance/High Potential.
▪ Assign more responsibility. ▪ Provide more decision-making power. ▪ Provide exposure to other course areas. ▪ Provide opportunity to manage. ▪ Increase the span of supervision. ▪ Assign high-risk assignments. ▪ Cross-train. ▪ Assign important special projects. ▪ Provide educational experiences that prepare for future advancement. ▪ Provide anything upward.

High Performance/Low Potential.
▪ Provide opportunities to update skills or knowledge. ▪ Provide experiences that enable instructors to stay abreast of their field of expertise. ▪ Provide opportunities to attend professional conferences. ▪ Encourage and support involvement in professional groups. ▪ Select to represent organization to others inside and outside the organization. ▪ Provide opportunities for advanced training. ▪ Give public recognition.

Low Performance/High Potential.
▪ Provide opportunities for skills training. ▪ Quick job move to match skills. ▪ Change in supervision. ▪ Provide opportunity to gain additional knowledge of the school.

Low Performance/Low Potential.
▪ Provide another chance in same or different job under same or different supervisor. ▪ Downgrading. ▪ Outplacement.

2. Medium Performance/Medium Potential Personnel at this rating should be treated as those with high performance or potential thereafter. Re-access after some time and then rate again. If no improvements, then treat as low performance or potential.

7205. STAFF SELECTION POLICY

In most Marine Corps Schools, there is a limited ability to select the staff. Staff members are primarily assigned to the school based largely on the needs of the Marine Corps and not necessarily on the extent of their teaching or training experience. As administrators in Marine Corps Schools, there is some flexibility in who is assigned to critical positions in the school, and as such, screening and selection is an important aspect of the plan. Staff selection and screening may or may not be formally outlined in the plan, but one should exist. The selection portion of the plan is where the individual is selected to match the job previously defined. Some schools are working closely with the monitors to ensure instructors go through a selection program.

1. Components of a Good System A good selection system provides the tools with which to judge a potential staff member's skills, experience, qualification and knowledge. This is related to having a job clearly defined; an extremely important step. Once the extent of the job is known, it becomes easier to match the individual to the job. It is recommended to require the following competencies, when possible, for selecting instructors:

a.	**Physically, psychologically and temperamentally and suited for instructor duty.**
b.	**Knowledge and expertise in the subject area to teach.**
c.	**Good communication skills or the potential to develop them.**
d.	**Maturity.**
e.	**Emotional Stability and ability to maintain self-control under all circumstances.**
f.	**Positive role model.**
g.	**People-oriented.**
h.	**Desire to teach.**

2. Developing Individual Plan After the screening and selection process has been concluded, it becomes necessary to assess individual performance and potential, and devise appropriate developmental steps for each staff member. It is important to look at what competencies the new staff member already possesses and determine where he/she falls in the staff development continuum. It is here the individual training track is outlined, a billet description is given, and if required, a mentor is assigned.

7206. TRAINING RESOURCES

Training resources are available to formal schools/detachments for personnel. However, the school has to plan both time and money for the implementation of such resources. The school needs to identify money in the budget for faculty development. Some of the resources that should be considered include, though not limited to, the Instructional Management School, professional level schools, scholarly publications, a school library, and/or the internet.

APPENDIX A

DESIGN WORKSHEETS

APPENDIX A is comprised of the following worksheets.

a. **Learning Analysis Worksheet.** This worksheet can be used to brainstorm knowledge and skills for each performance steps during the Design Phase.

b. **Learning Objective Worksheet.** This worksheet can be used to develop learning objectives, test items, and to determine the delivery system to be used.

c. **Media Matrix.** This matrix can be used by the curriculum developer to select a instructional method.

LEARNING ANALYSIS WORKSHEET

T&R Event or ITS Duty Description:	
T&R Event or ITS Duty Code:	Date:
Task:	Task Code:
Condition(s):	
Standards(s):	

Performance Steps:	**Knowledge, Skills, Attitudes (KSA):**

LEARNING OBJECTIVE WORKSHEET

Task Behavior:
Event Code (ITS #): Date:
Downgrade Justification: (ITS ONLY)
Use a Learning Objective Worksheet for each learning objective.
TLO/ELO (Circle one):
Test Item/Evaluation:
Method/Media:

METHOD SELECTION GRID

GRID KEY **HR** - Highly Recommended **R** – Recommended **NR** - Not Recommended **NI** - Comprehension Level **EI** -Higher Level **LG** - Large Class **SM** - Small Class **Indiv** - Individual	**PRESENTATION METHOD**					**STUDENT VERBAL INTERACTION METHODS**			**APPLICATION METHODS**				
	Lecture (Formal, Informal Briefing, Student Speech)	Indirect Discourse (Panel Discussion, Dialogue, Teaching Interview)	Demonstration (Operation of Equipment, or System)	Reading (Books, Periodicals, Microforms, Manuals, Handouts)	Self-Paced (Programmed, Modular, Computer Assisted, Mediated)	Questioning (Socratic Method, Student Query)	Discussion-Non Directed (Peer-Controlled Seminar Free Discussion)	Guided Discussion (Instructor Controlled)	Practical Application (Individual or Group)	Field Trips	Simulations (Role-Playing, Games)	Case Study	Coaching
DOMAINS AND LEVELS													
COGNITIVE													
Higher Levels	NR	NR	NR	NR	R	R	NR	NR	HR	NR	HR	HR	NR
Comprehension	HR	HR	NR	R	HR	HR	NR	HR	R	NR	R	R	NR
Knowledge	HR	R	NR	HR	HR	NR	NR	NR	R	R	NR	NR	NR
PSYCHOMOTOR													
Higher Level	NR	NR	HR	NR	R	NR	NR	NR	HR	NR	R	NR	HR
Lower Level	NR	NR	HR	NR	R	NR	NR	NR	HR	NR	R	NR	HR
AFFECTIVE													
Higher Levels	NR	NR	NR	NR	NR	NR	NR	NR	NR	R	HR	HR	NR
Lower Levels	HR	HR	NR	R	R	R	R	HR	R	HR	HR	R	HR
FACTORS AND CONSTRAINTS													
Minimum Level of Instructor Expertise	NI	NI	EI	EI	EI	EI	N/A	EI	EI	NI	EI	EI	EI
Class Size (1 = indiv; 2-12 = small; 13-24 = medium; 20+= large)	LRG/ MED	LRG/ MED	SM*	IND IV	INDIV	SM/ MED	MED	SM/ MED	INDI V/SM **	SM	SM/ MED	SM/ MED	INDI V/SM **
Evaluation Inherent in Method	NO	NO	YES	NO	YES	YES	NO	NO	YES	NO	YES	YES	YES
Responsive to Individual Needs	NO	NO	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES

** Consider breaking class into small groups if the number of students is large and there is instructional staff to support it.

APPENDIX B

DEVELOP PHASE TEMPLATES

APPENDIX B is comprised of the following items developed during the Develop Phase.

a. **Paper-based Concept Card.** This worksheet can be used to consolidate information [i.e. lesson designator, lesson title, hours, method, training support equipment, Terminal Learning Objectives (TLO), Enabling Learning Objectives (ELO), and the references] for each lesson prior to entering the information into the automated instructional database.

b. **Operational Risk Assessment Worksheet (ORAW)**. The ORA worksheet document the 5-step Operational Risk Management process as it relates to the lesson.

c. **Lesson Plan.** The lesson plan template provides the format for writing a lesson plan.

d. **Student Outline.** Two examples of formats for student outlines are included. There is no standard format for a student outline. It should be developed with the student in mind.

e. **Instructor Preparation Checklist.** This checklist is a required element in the Master Lesson File (MLF). It provides the instructor with information that is critical to the preparation for implementation of the lesson.

f. **Course Descriptive Data (CDD)/Program of Instruction (POI)**. The CDD provides a detailed summary of the course including instructional resources, class length, and curriculum breakdown. The POI describes the course in terms of structure, delivery methods and media, length, intended learning objectives, and evaluation procedures.

CONCEPT CARD

COURSE TITLE:				**DATE:**	
ANNEX:		**ANNEX TITLE:**			
LESSON ID:		**LESSON TITLE:**			

METHOD(S)	HOURS	S:I RATIO	MEDIA:
TOTAL HOURS:			

TERMINAL LEARNING OBJECTIVE(S) OR LESSON PURPOSE STATEMENT:

ENABLING LEARNING OBJECTIVE(S):

AMMUNITION REQUIREMENT(S):

		Expended		Unexpended		
DODIC	NOMENCLATURE	UNITS PER STUDENT	UNITS FOR SUPPORT	UNITS PER STUDENT	UNITS FOR SUPPORT	UNIT OF ISSUE

NOTES:

(This is created in a table in Microsoft Word. If more space is needed in a section, just continue to return and the form will expand.)

REFERENCES:	Reference #

SCHOOL:			COURSE:			
LESSON TITLE:			LESSON DESIGNATOR:			
PREPARED BY:			DATE:			
IDENTIFY HAZARDS			ASSESS HAZARDS	MAKE RISK DECISIONS		IMPLEMENT CONTROLS	SUPERVISE
List Learning Objective Behaviors	Sub-steps (If applicable)	List Hazards	Initial RAC	Develop Controls	Residual RAC	How to Implement	How to Supervise
Cease Training Criteria (CTC): **(During training, instructors may identify other hazards that require a decision to CT.)**							
Approving Signature:						Date:	

UNITED STATES MARINE CORPS
(SCHOOL NAME)
(LOCAL COMMAND)
(COMMAND)
(SCHOOL ADDRESS)

(For USMC in heading; font size is 14 and in bold. For rest of heading; font size is 10)

(The address should be ALL CAPS)

(1-inch margins: top, bottom, left, and right)

LESSON PLAN

(Courier New, font size 18 for LESSON PLAN only. All other font size is 12.)

LESSON TITLE

LESSON DESIGNATOR

COURSE TITLE

COURSE ID

REVISED MM/DD/YYYY

(If lesson plan is the original version, then type the MM/DD/YYYY the lesson plan originated. If lesson plan is a revised version, then type REVISED MM/DD/YYYY).

APPROVED BY _____ **DATE** _____

INTRODUCTION **(MIN)**
(Time cues are explained in the SAT Revision 2002 and in the Curriculum Developer Course at IMS.)

(ON MEDIA #) (Media may consist of PowerPoint slides, transparencies, turn charts, etc. If using PowerPoint, then ON SLIDE #1, ON SLIDE #2 etc. If using turn charts, then TURN CHART #1, etc. NOTE: Media cues are placed wherever they fall, even if it is within the text.)

(ON VIDEO "TITLE", VIDEO COUNTER #/SCENE #) (Provide the video counter number if VHS tape or the scene number if DVD in the media cue. If neither are available, provide a brief description of what segment of the video that is to be shown in an INSTRUCTOR NOTE.)
(OFF VIDEO "TITLE", VIDEO COUNTER #/SCENE #)

1. **GAIN ATTENTION.**
(A gain attention is provided along with other possible ideas. Lines are provided so that the instructor can personalize the gain attention to fit his/her personality.)
_____
_____
_____
_____

(ON SLIDE #)

2. **OVERVIEW.** Good morning/afternoon class, my name is _____.
[Overview contains the conceptual framework (outline/main ideas) that will be covered in the lesson. If applicable, it can also contain a statement that relates the lesson to previous learning/another lesson.]

INSTRUCTOR NOTE
Introduce learning objectives.

3. **LEARNING OBJECTIVES.**

a. **TERMINAL LEARNING OBJECTIVE.** (List as on concept card. List ITS designator after each TLO.)

b. **ENABLING LEARNING OBJECTIVES.** (List as on concept card.)

(1) (List ITS designator after each ELO.)

(2)

4. **METHOD/MEDIA.** (Describe the delivery system that will be used.)

INSTRUCTOR NOTE
Explain Instructional Rating Forms to students.

5. **EVALUATION.** (Provide how, when, and where the students will be tested.)

6. **SAFETY/CEASE TRAINING (CT) BRIEF. (If applicable)** Lessons that involve risk of injury or damage to equipment must include a safety brief. This is explained more thoroughly in the SAT.

(ON SLIDE #)

TRANSITION: (Ensure understanding of what is being taught, how it is being taught, and the expectations. Then introduce first main idea. Provide a Transition for the instructor to use and provide lines for instructor personalization.)

_____
_____
_____

(ON SLIDE #)

BODY **(MIN)**

(MAIN HEADING time cues are found at the INTRODUCTION, BODY, and SUMMARY. The MAIN HEADING time cues are right justified of the MAIN HEADING, bold, uppercase, and in parenthesis. Time cues are explained in the SAT Revision 2002 and in the Curriculum Developer Course at IMS.)

1. **MAIN IDEA #1. (Min)** (Main idea time cues are located 2 spaces right of the main idea in bold, letters with parenthesis. Main ideas are bold, underlined, and uppercase.)

a. **Paragraph Heading.** [If no paragraph heading, then use natural case (meaning regular sentence text – first word capitalized). Paragraph headings are bold, underlined, and title case (meaning first letter of each word is capitalized).]

(1) Paragraph Heading. [If no paragraph heading, then use natural case (meaning regular sentence text – first word capitalized). Paragraph headings are underlined and title case per example above.]

(a) Paragraph Heading.

1 Paragraph Heading. (To minimize confusion in following the outline, it is recommended that the use of these subparagraphs be minimized.)

a Paragraph Heading. (To minimize confusion in following the outline, it is recommended that the use of these subparagraphs be minimized.)

(ON TURN CHART #)

INTERIM TRANSITION: (Thus far, we've discussed main idea #1 . Do you have any questions? Let's move on to a demonstration of ….)

_____
_____
_____

INSTRUCTOR NOTE

Perform the following demonstration.

(Guidance on the instructional method being used should be in a box and shaded at 12.5 shading. There should be one space between the instructor note and the teaching method.)

DEMONSTRATION. [Provide general information to include group size, if applicable, time, along with setup (handouts, turn charts, actual items to distribute, etc.) and the number of instructor(s) required based upon the concept card. Provide the purpose of the demonstration.]

STUDENT ROLE: (Describe in detail step-by-step instructions of what the student's role during the demonstration will be.)

INSTRUCTOR(S) ROLE: (Describe each Instructor's role.)

1. Safety Brief: (If applicable) (Brief students on safety precautions and what to do if there is a mishap.)

2. Supervision and Guidance: (Describe a detailed script of exactly what the instructor is doing during the demonstration.)

3. Debrief: (If applicable) (Allow students the opportunity to comment on what they experienced and/or observed. Provide overall feedback, guidance on any misconceptions, and review the learning points of the demonstration.)

TRANSITION: (Review, Probe, and Introduce next main idea. More explanation on how to write transitions is provided in the SAT Revision 2002 and in the Curriculum Developer Course. Provide a Transition for the instructor to use, but also provide lines for personalization.)

_____
_____
_____

(ON SLIDE #)

2. **MAIN IDEA #2. (Min)**

(ON SLIDE #)

INTERIM TRANSITION: (So far, we've discussed main idea #2. Do you have any questions? If not, let's move on to the practical application of ….)

_____
_____
_____

INSTRUCTOR NOTE

Introduce the following practical application.

PRACTICAL APPLICATION. [Provide general information to include group size, if applicable, time, along with setup (handouts, turn charts, actual items to distribute, etc.) and the number of instructor(s) required based upon the concept card. Provide the purpose of the practical application.]

PRACTICE: (Describe in detail step-by-step instructions of what the student's role in the practical application will be.)

PROVIDE-HELP: (Describe each Instructor's role.)

1. Safety Brief: (If applicable) (Brief students on safety precautions and what to do if there is a mishap.)

2. Supervision and Guidance: (Describe what the instructor is doing during the PA i.e. moving about the room, assisting students, answering questions.)

3. Debrief: (If applicable) (Allow participants opportunity to comment on what they experienced and/or observed. Provide overall feedback, guidance on any misconceptions, and review the learning points of the PA.)

TRANSITION: (Review, Probe, and Introduce next main idea. More explanation on how to write transitions is provided in the SAT Revision 2002 and the Curriculum Developer Course. Provide a Transition for the instructor to use, but also provide lines for personalization.)

_____
_____
_____

(BREAK – 10 Min) (Break cues are explained in the SAT Revision 2002 and in the Curriculum Developer Course at IMS.)

(ON SLIDE #)

3. **MAIN IDEA #3. (Min)**

(ON HANDOUT #)

INTERIM TRANSITION: (Thus far, we've discussed main idea #3 . Do you have any questions? If not, let's move on to the case study of ….)

_____
_____
_____

INSTRUCTOR NOTE

Introduce Case Study.

CASE STUDY. [Provide general information along with setup (handouts, turn charts, actual items to distribute, etc.) and the number of instructor(s) required based upon the concept card. Provide the purpose of the case study.]

STUDENT ROLE: (Describe in detail step-by-step instructions of what the student's role during the case study will be.)

INSTRUCTOR(S) ROLE: (Describe each Instructor's role.)

1. Safety Brief: (If applicable) (Brief students on safety precautions and what to do if there is a mishap.)

2. Supervision and Guidance: (Describe a detailed script of exactly what the instructor is doing during the case study.)

3. Debrief: (If applicable) (Allow participant opportunity to comment on what they experienced and/or observed. Provide overall feedback, guidance, and review the learning points of the case study.)

(ON SLIDE #)

TRANSITION: (Review, Probe, and Introduce next main idea. More explanation on how to write transitions is provided in the SAT Revision 2002 and the Curriculum Developer Course. Provide a Transition for the instructor to use, but also provide lines for personalization.)

_____
_____
_____

4. **MAIN IDEA #4. (Min)**

(ON SLIDE #)

TRANSITION: (Review, Probe, and Introduce next main idea. More explanation on how to write transitions is provided in the SAT Revision 2002 and the Curriculum Developer Course. Provide a Transition for the instructor to use, but also provide lines for personalization.)

_____
_____
_____

INSTRUCTOR NOTE

Introduce the following practical application.

PRACTICAL APPLICATION. (Min) (This is a special case where a method has its own time cue. Time cues are explained in the SAT Revision 2002 and the Curriculum Developer Course at IMS.)
[Provide general information to include group size, if applicable, along with setup (handouts, turn charts, actual items to distribute, etc.) and the number of instructor(s) required based upon the concept card. Provide the purpose of the practical application.]

PRACTICE: (Describe in detail step-by-step instructions of what the student's role in the practical application will be.)

PROVIDE-HELP: (Describe each Instructor's role.)
1. Safety Brief: (If applicable) (Brief students on safety precautions and what to do if there is a mishap.)
2. Supervision and Guidance: (Describe what the instructor is doing during the PA i.e. moving about the room, assisting students, answering questions.)
3. Debrief: (If applicable) (Allow participant opportunity to comment on what they experienced and/or observed. Provide overall feedback, guidance on any misconceptions, and review the learning points of the PA.)

TRANSITION: (Review, Probe, and Introduce next main idea. More explanation on how to write transitions is provided in the SAT Revision 2002 and the Curriculum Developer Course. Provide a Transition for the instructor to use, but also provide lines for personalization.)

_____

_____

_____

SUMMARY **(MIN)**

[Provide overview of main ideas covered (no questions should be asked here). Provide closure (relevance to job) and administrative instructions (IRF's, break).]

Develop a Concept Card

Introduction

We will be discussing the information necessary to develop concept cards. We will do this by covering the purpose, categories, elements of a concept card, and the steps in developing a concept card utilizing the Marine Corps Automated Instructional System (MCAIMS).

Importance

A Concept Card provides continuity of instruction by identifying the method, media, hours allowed, student/ instructor ratio, TLO/ELO'S, references, and/or any notes pertinent to the conduct of the lesson. By accounting for all of the aspects associated with a given course on their respective concept cards, this will accurately reflect the resources required to successfully conduct a course.

Learning Objectives

TERMINAL LEARNING OBJECTIVE: Given a course structure and learning objectives, develop a concept card per the SAT Guide and MCAIMS Users Manual.

ENABLING LEARNING OBJECTIVES:

With the aid of references, given a course structure and learning objectives, record the required elements to establish a task oriented concept card in accordance with the SAT Guide, the MCAIMS User's Manual and the IMS Concept Card Checklist.

With the aid of references, given a course structure and learning objectives, record the required elements to establish an exam concept card in accordance with the SAT Guide, the MCAIMS User's Manual and the IMS Concept Card Checklist.

With the aid of references and given a course structure working as a group, record the elements required to establish a administrative concept card in accordance with the SAT Guide, the MCAIMS User's Manual and the IMS Concept Card Checklist.

With the aid of references and given a course structure working as a group, record the required elements to establish a lesson purpose concept card in accordance with the SAT Guide, the MCAIMS User's Manual and the IMS Concept Card Checklist.

STUDENT OUTLINE EXAMPLE

UNITED STATES MARINE CORPS
Instructional Management School
Marine Corps Service Support Schools
PSC Box 20041
Camp Lejeune, North Carolina 28542-0041

DEVELOP A CONCEPT CARD
STUDENT OUTLINE

CD0203
SEP 99

What Will I Learn From This Class?

1. Terminal Learning Objective. Given a course structure and learning objectives, develop a concept card per the SAT Guide and MCAIMS Users Manual.

2. Enabling Learning Objectives

a. With the aid of references, given a course structure and learning objectives, record the required elements to establish a task oriented concept card in accordance with the SAT Guide, the MCAIMS User's Manual and the IMS Concept Card Checklist.

b. With the aid of references, given a course structure and learning objectives, record the required elements to establish an exam concept card in accordance with the SAT Guide, the MCAIMS User's Manual and the IMS Concept Card Checklist.

c. With the aid of references and given a course structure working as a group, record the elements required to establish a administrative concept card in accordance with the SAT Guide, the MCAIMS User's Manual and the IMS Concept Card Checklist.

d. With the aid of references and given a course structure working as a group, record the required elements to establish a lesson purpose concept card in accordance with the SAT Guide, the MCAIMS User's Manual and the IMS Concept Card Checklist.

Let's Get Started!

1. **Purpose**. Concept cards have both a primary and a secondary purpose. The primary purpose is to provide the school with a…

UNITED STATES MARINE CORPS
(SCHOOL NAME)
(LOCAL COMMAND)
(COMMAND)
(SCHOOL ADDRESS)

INSTRUCTOR PREPARATION GUIDE

LESSON TITLE: (As on concept card)

LESSON DESIGNATOR: (As on concept card)

TOTAL LESSON TIME: (As on concept card)

REFERENCES: (List references from concept card)

LOCATION OF TEST: (List where the test is located)

PERSONNEL REQUIRED: (List as listed on concept card i.e. instructors, support personnel, Corpsman)

FACILITIES: (List as listed on concept card i.e. classroom, laboratory, ranges, etc.)

REVIEW COURSE MATERIALS:

☐ Review the course/training schedule, administrative requirements, student background information, lesson plans, student materials, media, and evaluations (tests).

ADD PERSONALIZATION:

☐ Personalize the lesson plan by adding subject matter detail, relating personal experiences, providing examples, questions, and/or interactive techniques.

MATERIALS/EQUIPMENT: Make a checklist of items that the instructor needs for the lesson (i.e. Models, Mock-ups, training aids, audio-visual equipment).

Example:

☐ Video Cassette

EXERCISE SETUP AND PLANNING: List exercises (i.e. Demonstrations, Practical Applications) and the setup and planning involved for each specific to the lesson. Describe as a step-by-step process).

Example:

Demonstration

☐

☐

SAFETY:

☐ Review ORA in Master Lesson File

☐ Reassess the environment for changes that affect the original ORA. Document any additional considerations/controls on the After Instruction Report (AIR) for future reference.

APPROVING SIGNATURE _____**DATE** _____

Date: 20020313

INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

PREFACE

This course is designed to train Marines in the formal preparation and delivery of instruction at the Marine Corps School of Infantry (SOI) and Marine Combat Training (MCT) as defined by the SAT Guide. Comments/recommendations related to this POI may be sent to:

Director Instructional Management School
Marine Corps Combat Service Support Schools
PSC Box 20041
Camp Lejeune, NC 28542

Date: 20020313

INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

SECTION I - COURSE DESCRIPTIVE DATA

1. COURSE TITLE. INSTRUCTOR ORIENTATION COURSE

2. LOCATION. Instructional Management School
Marine Corps Combat Service Support Schools
PSC Box 20041
Camp Lejeune, North Carolina 28542-0041

This course is taught at the School of Infantry, Camp Lejeune, NC.

3. COURSE ID. M03H4UA

4. OTHER SERVICE COURSE NUMBER. N/A

5. MILITARY ARTICLES AND SERVICE LIST NUMBER. N/A

6. PURPOSE. The purpose of this course is to train Squad Instructors assigned to the School of Infantry in the formal preparation and delivery of instruction in accordance with the Systems Approach to Training (SAT). Students work in small groups with the emphasis on employing the demonstration, coaching, and practical application methods of teaching.

7. SCOPE. This course provides the skills required for Marines to succeed as Squad Instructors at the School of Infantry. The course includes rehearsal techniques, coaching techniques, lesson presentation, student management techniques, administration of performance evaluations, and refinement of the basic speaking/listening skills.

8. LENGTH (PEACETIME). 5 Training Days

9. CURRICULUM BREAKDOWN (PEACETIME).

35.75 Academic Hours
12.00 Practical Application (Individual)
1.50 Demonstration
9.50 Lecture
0.50 Instructional Videotape
10.50 Performance Exam
1.25 Remedial Performance Exam
0.50 Written Exam
Administrative Hours 1.50
1.00 Graduation Exercise/EOC
0.50 IOC Course Overview

10. LENGTH (MOBILIZATION). 5 Training Days

11. CURRICULUM BREAKDOWN (MOBILIZATION). Same as Peacetime.

12. MAXIMUM CLASS CAPACITY. 12

13. OPTIMUM CLASS CAPACITY. 12

14. MINIMUM CLASS CAPACITY. 6

15. CLASS FREQUENCY. 7

16. STUDENT PREREQUISITES. This course is appropriate for Sergeants and below who are assigned as a Squad Instructor at the School of Infantry (Infantry Training Battalion (ITB)) or Marine Combat Training (MCT).

17. MOS RECEIVED. None.

Date: 20020313

INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

SECTION I - COURSE DESCRIPTIVE DATA

18. QUOTA CONTROL. CG MCCDC (C463 FT)

19. FUNDING. CG MCCDC (463 FM)

20. REPORTING INSTRUCTIONS. Report to the Academics Officer, School of Infantry, Camp Geiger, Bldg TC855. Report time is no later than 0715 on the course convening day. Messing and billeting are available for students.

    Instructional Management School
    DSN: 750-0941
    COMM: 910-450-0941

    School of Infantry
    DSN: 750-0118/0134
    COMM: (910) 450-0118/0134

21. INSTRUCTOR STAFFING REQUIREMENTS. See Appendix A for Instructor Computation Worksheet.

    1. Request T/O 7551 be modified to reflect the addition of 2 instructors to support this course per the Instructor Computation Worksheet. Current T/O does not provide enough instructors to effectively support IMS's current tasking and the additional requirements for this course.

    2. Instructors assigned to most Marine Corps formal schools are subject matter experts and only require training to hone their instructional techniques. This is not the case with instructors assigned to the Instructional Management School. Instructors are assigned from a wide range of occupational fields and have no previous experience in the areas of Instructional Systems Design, instructional delivery techniques, adult learning theories, education processes, and the Systems Approach to Training. The staff development process required to train an IMS instructor is extremely extensive. It takes approximately eighteen to twenty four months for an instructor to gain proficiency in one IMS Program of Instruction. This is comparable to the eighteen months required to train a Marine Enlisted Education Staff Non-Commissioned Officer, MOS 9917, to become Individual Standards Designers, or Professional Development Education Analysts. As the organization responsible for training the trainers, curriculum developers and school administrators to support all Marine Corps Formal Schools and Training Centers, it is imperative that instructors assigned to IMS are duty experts in the areas of training and education. Instructors of the highest caliber, knowledgeable in education processes are absolutely essential and a requirement in order to effectively train the trainers who "Sustain the Transformation."
    3. IMS has a small staff (School Director, and 9 instructors) responsible for developing, managing, and implementing its seven formal courses of instruction (both resident and MTT). Because of this limited structure, IMS must have instructors who are capable of effectively teaching each course if it is to successfully train all Marine Corps formal school faculty. The only way to successfully accomplish this mission and meet the student numbers identified in the Training Input Plan (TIP) is to cross-utilize instructors. Several factors dictate this cross-utilization. These factors include: number of instructors on staff, number of courses taught, student to instructor ratio for each course, and the number of classes taught for each course during the year. Because of course scheduling during the year, each instructor may be used in every course. For example, an instructor may teach an Instructor Orientation Course (IOC) one week, teach and act as faculty advisor for the Curriculum Developers Course (CDC) students the next, and then be sent on a Formal School Instructor Course (FSIC) Mobile Training Team (MTT) for the following two weeks. When looking at the IMS as a whole, the difficulties of associating specific T/O line numbers to a course becomes evident. If this formula is applied, instructor usage would not be adequately reflected in the CDD. Therefore, all nine instructor billets are listed below with the asterisk identifying the Course Chief.

Date: 20020313

INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

SECTION I - COURSE DESCRIPTIVE DATA

LN#	GRADE	MOS	BILLET DESCRIPTION	REQUIRED
52	E8	9917	Chief Instructor	1
54	E7	3529	Instructor	1
55	E7	3529	*Instructor	1
56	E7	1371	Instructor	1
57	E7	0369	Instructor	1
57A	E7	1371	Instructor	1
58	E7	0193	Instructor	1
58A	E7	0369	Instructor	1
58B	E7	3537	Instructor	1

22. SCHOOL OVERHEAD REQUIREMENTS.

LN#	GRADE	MOS	BILLET DESCRIPTION	REQUIRED
51	O4	9602	Director	1
51A	O3	9910	Course Coordinators	2
51B	G12	1750	Instructional System Specialist	1
59	G04	0318	Secretary	1

Comments Line# 51B: GS-12 Instructional System Specialist, this line number is currently unfunded. The need for a professional level educator on the staff of IMS is imperative. IMS (East) has the role of lead school, responsible for developing curriculum to train instructors, administrators, and curriculum developers for Marine Corps formal schools and training centers both on the east and west coast. The transient nature of the IMS staff has resulted in a serious erosion in the area of curriculum development. The turnover time for instructors assigned to IMS averages eighteen to twenty four months. This presents a severe problem for the school in the areas of continuity, instructor development and certification. A resident professional level civilian educator would alleviate the problems associated with the lack of staff continuity. If the GS-12 billet continues to remain unfilled, the quality and content of IMS curricula and instruction will deteriorate. This will adversely impact the quality of instruction provided to all Marine Corps Formal Schools and Training Centers. Additionally, if the quality of IMS instruction is deficient, this will have a direct negative effect on the quality of the Marines provided to the Operating Forces. This billet is absolutely essential in order to execute the dictates of the IMS charter and support the Marine Corps Training Modernization Initiative. If this line number remains unfunded, it will have a severe negative impact on IMS (East) ability to execute its tasking as lead school.

Comments Line# 59 : This billet number should be upgraded to GS-07, Education Technician. This would provide continuity within the instructor staff, and address the deficiency in the level of expertise resulting from the highly transient nature of the IMS instructors. Additionally, an Education Technician would support the offering of this course, the Instructor Orientation Course, the Curriculum Developer Course and Administrators Course.

23. TRAINING/EDUCATION SUPPORT REQUIREMENTS. The following are training and education support requirement shortfalls:

Video Camera/Tripod: Funding for 2 video cameras at a cost of $600.00 per camera, totaling $1200.00, and 2 tripods at a cost of $100.00 totaling $200.00. These represent costs for 2 cameras needed to support the new requirements of this course. The course is structured to provide the ability to record student presentations for review and critique.

The following facility requirements are identified for one iteration of this course:

FACILITY	FACILITY ID	SQ FT	REQ'D	ON HAND	SHORT
CLASSROOMS	NA	150	3	3	0

The following materiel requirements are identified for one iteration of this course:

NOMEMCLATURE	NSN	UNIT OF ISSUE	REQ'D	ON HAND	SHORT
BOOKS	NA	EACH	12	12	0
VIDEO CAMERA	671000C002007	EACH	2	2	0
VIDEO CAMERA TRIPOD	676001C003271	EACH	2	2	0

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INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

24. TASK LIST. See Appendix B.

CDD NOTES: IMS's current T/O does not provide enough instructors to effectively execute this course's requirement and the concurrent training IMS provides.

Date: 20020313

INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

SECTION II - SUMMARY OF HOURS

PEACETIME (5 TRAINING DAYS)

ACADEMIC TIME

TITLE	HOURS	ANNEX
PREPARE FOR INSTRUCTION	20.00	A
IMPLEMENT INSTRUCTION	15.75	B
TOTAL ACADEMIC HOURS:	35.75	

ADMINISTRATIVE TIME

GRADUATION EXERCISE/EOC	1.00	Z
IOC COURSE OVERVIEW	0.50	Z
TOTAL ADMINISTRATIVE HOURS:	1.50	

SUMMARY (PEACETIME)

ACADEMIC TIME	35.75
ADMINISTRATIVE TIME	1.50
TOTAL ACADEMIC AND ADMINISTRATIVE TIME:	37.25

MOBILIZATION (5 TRAINING DAYS)

During Mobilization, the length of training days would not change.

Date: 20020313

INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

SECTION I - COURSE DESCRIPTIVE DATA

APPENDIX A - INSTRUCTOR COMPUTATION WORKSHEET (LOCKSTEP)

SECTION I COURSE DATA

COURSE: M03H4UA INSTRUCTOR ORIENTATION COURSE

LOCATION: Instructional Management School
Marine Corps Combat Service Support Schools
PSC Box 20041
Camp Lejeune, North Carolina 28542-0041
This course is taught at the School of Infantry, Camp Lejeune, NC.

PROGRAMMED ANNUAL INPUT (FY 02): 84 LENGTH (AVG CAL DAYS): 5

PROGRAMMED NUMBER OF CLASSES/YEAR: 7 LENGTH (TRAINING DAYS): 5

SYLLABUS HOURS: 35.75

SECTION II CURRICULUM BREAKOUT

(A)	(B)		(C)		(D)		(E)		(F)
TRAINING SITUATION	MAX CLASS SIZE	÷	MAX RATIO (X:1)	=	INST REQ	x	SYLLABUS HOURS	=	INST MANHOURS
Practical Application (Individual	12	÷	6.00	=	2.00	x	12.00	=	24.00
Demonstration	12	÷	12.00	=	1.00	x	1.50	=	1.50
Lecture	12	÷	12.00	=	1.00	x	9.50	=	9.50
Instruct Videotape	12	÷	12.00	=	1.00	x	0.50	=	0.50
Performance Exam	12	÷	6.00	=	2.00	x	10.50	=	21.00
Remedial Perf Exam	12	÷	9.00	=	1.33	x	1.25	=	1.67
Written Exam	12	÷	12.00	=	1.00	x	0.50	=	0.50

TOTAL INSTRUCTOR MANHOURS PER CLASS(G): 58.67

SECTION III INSTRUCTOR COMPUTATION

TOTAL INSTRUCTOR MANHOURS PER CLASS	x	PROGRAMMED NUMBER OF CLASSES	=	ANNUAL INSTRUCTOR CONTACT HOURS 410.67
ANNUAL INSTRUCTOR CONTACT HOURS	x 1.26		=	ANNUAL INSTRUCTOR HOURS 517.44
ANNUAL INSTRUCTOR HOURS	÷ 12		=	MONTHLY INSTRUCTOR HOURS 43.12
MONTHLY INSTRUCTOR HOURS	÷ 145		=	INSTRUCTORS REQUIRED 0.297 = 1

ICW NOTES: According to the ICW worksheet, 1 instructor is required to teach this course. IMS utilizes a faculty advisor concept with a 6 to 1student to instructor ratio. The actual instructor requirement to support a 6:1 ratio is 2.

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INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

APPENDIX B – TASKLIST

DUTY: 9806.03 IMPLEMENT INSTRUCTION

TASKS: (S) 9806.03.01 Prepare for instruction
(S) 9806.03.02 Conduct a lesson
(P) 9806.03.03 Administer tests

TASK LIST NOTES: None.

Date: 20020313

INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

SECTION III - SCOPE OF ANNEXES

A. PREPARE FOR INSTRUCTION. These lessons address the preparation skills and techniques required to effectively implement instruction.

B. IMPLEMENT INSTRUCTION. These lessons address the actual performance and delivery of instruction.

Z. ADMINISTRATIVE. This annex addresses the commencement exercise.

Date: 20020313

INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

SECTION IV - CONCEPT CARDS

1. A concept card is developed to describe each academic or administrative block of time during a course. These concept cards are then grouped into subject areas, called annexes, which are summarized in Section III. Annexes A through Y are reserved for academic lessons and exams. Annex Z is reserved for administrative time.

2. The following information is contained on each academic concept card in Section IV:

a. Heading. The heading listed at the top of the concept card includes the name of the course, the section of the POI, and the letter and title of the annex to which the lesson or exam is assigned.

b. Lesson/Exam ID. This designator is a unique code assigned to this specific lesson or exam within this course.

c. Hours. This number (carried to the second decimal place) depicts the amount of time required to conduct the lesson or exam once, even if it is presented multiple times to smaller groups of students.

d. Title. This is the title assigned to this lesson or exam. It should refer to the subject matter covered in the lesson or exam when possible.

e. Phase (optional). This is a code depicting the phase (e.g., week, month, etc.) of the course during which this lesson or exam takes place.

f. Group (optional). This is a code depicting the instructional group or section responsible for teaching or developing this lesson or exam.

g. Methods,Hours,S:I Ratio. Displayed on the concept card are codes which symbolize the methods of instruction used to present this lesson or exam. Following each method code is the time (in hours) allocated to that method and the student to instructor ratio associated with that period of time. (The hours and ratios depicted on the concept card are used to determine instructor staffing requirements.) The following is a comprehensive list of methods used in this course and their respective codes:

Method	Code
Practical Application (Individual)	A(I)
Administrative	ADMIN
Demonstration	D
Lecture	L
Instructional Videotape	VT
Performance Exam	X(P)
Remedial Performance Exam	X(P) INDV
Written Exam	X(W)

h. Media. Displayed on the concept card are codes which symbolize the media used to support this lesson or exam. The following is a comprehensive list of media used in this course and their respective codes:

Medium	Code
Chart	C
Computer Aided Graphics	CAG
Handout	HO
Model	M
Mockup	MU
None	N
Overhead Projector	OH
Printed Materials	PM
Slides	S
Slide Projector	SP
Transparency Projector	T-P
Transparencies	TP
Television	TV
Videotape	VT
Dry Erase Board	WB

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INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

SECTION IV - CONCEPT CARDS

i. Learning Objective(s)/Lesson Purpose. Academic concept cards contain either learning objectives or a lesson purpose statement, but not both.

(1) Learning Objective. A learning objective describes a behavior that students are expected to perform following instruction, not necessarily identical to a behavior performed on the job. It also details the conditions under which that behavior is performed and the minimum standards of acceptable performance. A student masters the objective when his or her performance equals or exceeds the standard. (Information concerning student evaluation and mastery is contained in Section V of this POI.)

(a) Terminal Learning Objective (TLO). One, and only one, TLO is written for each task in Section I-B of the POI. The behavior in the TLO duplicates the actual behavior required on the job, modified only if the constraints of the academic environment will not allow it. A TLO should only appear on a concept card for a lesson or exam during which students actually perform the TLO. Each TLO is assigned a numeric designator identical to the designator of its corresponding task in Section I-B, which is identical to the designator of the Individual Training Standard (ITS) from which the task was derived. This designator is located in parentheses at the end of the TLO.

(b) Enabling Learning Objective (ELO). ELOs are designed to teach students the knowledges and skills required for successful performance of the TLOs. Each ELO is placed only on concept cards for lessons or exams during which students actually perform the ELO. Many introductory lessons will contain only ELOs. Each ELO is assigned the same numeric designator as the TLO it supports, followed by a unique combination of one or two letters. This designator is located in parentheses at the end of the ELO. (The first 26 ELOs are assigned the letters "a" through "z" consecutively. If there are more than 26 ELOs, they are assigned the letters "aa" through "az," then "ba" through "bz," etc.)

(2) Lesson Purpose.A lesson purpose statement is recorded on a concept card where no learning objectives are appropriate (e.g., overview, orientation, or enrichment lesson) and the lesson is not to be evaluated. The lesson purpose statement clearly describes the rationale for presenting the lesson.

j. Ammunition Requirements. Whenever a lesson requires the use of ammunition by students or by the instructional staff in support of the lesson, the concept card for that lesson will include a table depicting those requirements. Included for each type of ammunition will be its Department of Defense Identification Code (DODIC), its nomenclature, the average number of rounds used by each student, and the number of support rounds.

k. Notes (optional). This section of the concept card contains any information pertinent to the lesson. Examples of items which may be addressed here are instructor requirements, scheduling notes, special prerequisites, references to tests on which material will be evaluated, etc.

l. References . This section contains the source documents used for development of the lesson or other references that relate to the lesson. At a minimum, it must contain all documents referenced in the learning objectives included on the concept card.

3. The following information is contained on each administrative concept card in Section IV:

a. Heading. The heading listed at the top of the concept card includes the name of the course, the section of the POI, and the fact that this concept card is part of Annex Z, Administrative Time.

b. Event ID. This designator is a unique code assigned to this administrative event within the course.

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INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

SECTION IV - CONCEPT CARDS

c. Hours. This number (carried to the second decimal place) depicts the amount of administrative time required for this event. If this is a repeating event, one concept card may indicate the cumulative hours associated with this event throughout the course.

d. Event. This is a short description of the administrative event.

e. Notes (optional). This section of the concept card contains any information pertinent to the administrative block of time.

4. The following pages contain useful information for locating the learning objectives and lessons that make up this course.

a. Location of Learning Objectives Report. This report lists, by learning objective designator, all learning objectives developed for this course. It also identifies every concept card on which each learning objective is included.

b. Academic and Administrative Summaries. These reports list, by annex, all academic and administrative concept cards in Section IV. Within each annex the concept cards are listed in lesson identifier order. The information provided for each entry includes Identifier, Title, Hours, and Type [Task-oriented lesson (T), Lesson Purpose lesson (LP), Exam (E), or Administrative Time (ADM)]. A subtotal of hours is provided for each annex and for all academic and administrative concept cards. Total POI hours are listed at the end of the Administrative Summary.

Date: 20020313

INSTRUCTOR ORIENTATION COURSE

SECTION IV - CONCEPT CARDS

ANNEX A - PREPARE FOR INSTRUCTION

LESSON ID: IT04A HOURS: 5.25

TITLE: Demonstration Rehearsal

METHOD	HOURS	S:I RATIO
A(I)	5.25	6:1

MEDIA: N

TERMINAL LEARNING OBJECTIVE(S):

1. With the aid of references and given instructional materials and the requirement to present a lesson, prepare for instruction per the SAT Guide. (9806.03.01)

2. With the aid of references and given instructional materials, a time, place, students, and a time limit, conduct a lesson per the SAT Guide. (9806.03.02)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given instructional materials and the requirement to present a lesson, rehearse a lesson per the IMS Conduct a Lesson Checklist and the SAT Guide. (9806.03.01i)

2. With the aid of references and given instructional materials and the requirement to present a lesson, prepare instructional aids per the IMS Instructional Aids Checklist and the SAT Guide. (9806.03.01c)

3. Given instructional materials and the requirement to present a lesson, employ communication techniques per the IMS Conduct a Lesson Checklist and the SAT Guide. (9806.03.01g)

4. Given instructional materials and the requirement to present a lesson, employ questioning techniques per the IMS Conduct a Lesson Checklist and the SAT Guide. (9806.03.01h)

5. With the aid of references and given instructional materials and the requirement to present a lesson, prepare instructional environment per the IMS Conduct a Lesson Checklist and the SAT Guide. (9806.03.01j)

6. Given instructional materials, a time, place, students, and a time limit, present the introduction per the IMS Conduct a Lesson Checklist and the SAT Guide. (9806.03.02a)

7. Given instructional materials, a time, place, students, and a time limit, present a demonstration per the IMS Conduct a Lesson Checklist and the SAT Guide. (9806.03.02b)

8. Given instructional materials, a time, place, students, and a time limit, present the summary per the IMS Conduct a Lesson Checklist and the SAT Guide. (9806.03.02e)

9. Given instructional materials, a time, place, students, and a time limit, employ classroom management techniques per the IMS Conduct a Lesson Checklist and the SAT Guide. (9806.03.02f)

10. Given instructional materials and the requirement to present a lesson, display instructional aids per the SAT Guide and AFMAN 36-2236. (9806.03.02h)

NOTE(S):

Individual practical application allows each student 45 minutes to rehearse their 30 minute presentation in the classroom environment.

Each presentation will take 45 Min, this includes setup, breakdown and critique, time.
45 Min x 6 Students = 270 Min. (4.5 hrs.) + 45 Min. (Breaks) = 5.25

Date: 20020313

INSTRUCTOR ORIENTATION COURSE

SECTION IV - CONCEPT CARDS

ANNEX A - PREPARE FOR INSTRUCTION

REFERENCE	REFERENCE #
1. Handbook for Air Force Instructors	AFMAN 36-2236
2. DOD Handbook	MIL-HDBK-1379-2
3. Systems Approach to Training Manual	SATMANUAL
4. Navy Education and Training Manual	NAVEDTRA 130 SERIES
5. Instructional Management School Conduct a Lesson Checklist	IMS CLC
6. Instructional Management School Instructional Aids Checklist	IMS IAC

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INSTRUCTOR ORIENTATION COURSE

SECTION IV - CONCEPT CARDS

ANNEX A - PREPARE FOR INSTRUCTION

EXAM ID: IT03 HOURS: 2.50

TITLE: MLF Review

METHOD	HOURS	S:I RATIO
A(I)	1.50	6:1
L	1.00	12:1

MEDIA: CAG, HO, TV

TERMINAL LEARNING OBJECTIVE(S):

1. With the aid of references and given instructional materials and the requirement to present a lesson, prepare for instruction per the SAT Guide. (9806.03.01)

ENABLING LEARNING OBJECTIVE(S):

1. With the aid of references and given a lesson plan, a learning objective checklist, and the requirement to present a lesson, review learning objectives per the IMS Learning Objective Checklist and the SAT Guide. (9806.03.01a)

2. With the aid of references and given a lesson plan, lesson plan checklist, and the requirement to present a lesson, review a lesson plan per the IMS Lesson Plan Checklist and the SAT Guide. (9806.03.01b)

3. With the aid of references and given a student outline, a student outline checklist, and the requirement to present a lesson, review student outline per the IMS Student Outline Checklist and the SAT Guide. (9806.03.01d)

4. With the aid of references and given supplemental student material(s) and the requirement to present a lesson, review supplemental student material(s) per the IMS Supplemental Student Material Checklist and the SAT Guide. (9806.03.01e)

5. Without the aid of references and given testing material(s) and the requirement to present a lesson, state in writing the process to review testing material(s) per the IMS Testing Material Checklist and the AFMAN 36-2236. (9806.03.01f)

NOTE(S):

Individual Practical Application provides the instructor 15 Minutes to review each Master lesson file with the students. 15 Minutes x 6 Students = 1.50 hours

REFERENCE	REFERENCE #
1. Handbook for Air Force Instructors	AFMAN 36-2236
2. DOD Handbook	MIL-HDBK-1379-2
3. Systems Approach to Training Manual	SATMANUAL
4. Instructional Management School Supplemental Student Materials Checklist	IMS SSMC
5. Instructional Management School Learning Objective Checklist	IMS LOC
6. Instructional Management School Lesson Plan Checklist	IMS LPC
7. Instructional Management School Student Outline Checklist	IMS SOC
8. Instructional Management School Testing Material Checklist	IMS TMC
9. Instructional Management School Media Checklist	IMS MC

Date: 20020313

INSTRUCTOR ORIENTATION COURSE

SECTION IV - CONCEPT CARDS

ANNEX B - IMPLEMENT INSTRUCTION

LESSON ID: IT06 HOURS: 1.50

TITLE: Administer Tests

METHOD	HOURS	S:I RATIO
L	1.50	12:1

MEDIA: CAG, HO

TERMINAL LEARNING OBJECTIVE(S):

1. Given the requirement to evaluate the student's learning, state in writing how to administer a test per the AFMAN 36-2236 (9806.03.03)

   DOWNGRADE JUSTIFICATION: This task is being taught to a preliminary level at the school. Due to time constraints, it is not feasible to effectively evaluate all students administering norm referenced and criterion referenced tests during the course of instruction.

2. With the aid of references and given instructional materials and the requirement to present a lesson, prepare for instruction per the SAT Guide. (9806.03.01)

ENABLING LEARNING OBJECTIVE(S):

1. Given the requirement to evaluate the student's learning, state in writing how to prepare the testing environment per the AFMAN 36-2236. (9806.03.03a)

2. Given the requirement to evaluate the student's learning, state in writing how to conduct testing per the AFMAN 36-2236. (9806.03.03b)

3. Without the aid of references and given testing material(s) and the requirement to present a lesson, state in writing the process to review testing material(s) per the IMS Testing Material Checklist and the AFMAN 36-2236. (9806.03.01f)

NOTE(S):

Task 9806.03.03. The standard has been modified to accurately reflect the current standard used by IMS. The SAT Manual does not go into great detail on this subject and it is not feasible for every student to properly administer tests in their groups in the time allotted for the course.

REFERENCE	REFERENCE #
1. Handbook for Air Force Instructors PAGE/CHAPTER : Chapters 20 thru 24.	AFMAN 36-2236
2. Systems Approach to Training Manual PAGE/CHAPTER : Pages 2-23 thru 2-33.	SATMANUAL
3. Instructional Management School Testing Material Checklist	IMS TMC
4. DOD Handbook	MIL-HDBK-29612-2A

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INSTRUCTOR ORIENTATION COURSE

SECTION IV - CONCEPT CARDS

ANNEX Z - ADMINISTRATIVE

EVENT ID: IT00 HOURS: 0.50

EVENT: IOC Course Overview

METHOD	HOURS	S:I RATIO
L	0.50	12:1

MEDIA: CAG

NOTE(S):

No student handouts are required for this class. The student will be required to complete a NAVSO 5724/1 (Fleet Home Town News Release Form) and a locally produced Student Data Sheet.

REFERENCE	REFERENCE #
1. Systems Approach to Training Manual	SATMANUAL
2. Academic SOP	MCCSSSO P5000.1_
3. Standing Operating Procedures for Instructional Management School	IMS SOP

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INSTRUCTOR ORIENTATION COURSE PROGRAM OF INSTRUCTION

SECTION V - STUDENT PERFORMANCE EVALUATION

1. SCOPE. This course utilizes performance examination requiring students to duplicate job performance requirements.

2. MASTERY LEARNING. The evaluation philosophy used in this course requires student mastery of 100% of the Terminal Learning Objectives, 80% of the Enabling Learning Objectives and to achieve an overall passing score of 80%.

3. EVALUATION OF STUDENTS

a. Exams. Each student is evaluated on the Learning Objectives completed during each testing period before proceeding to the next. All Learning Objectives are tested utilizing performance based examinations.

b. Remedial Training. In accordance with school policy, remedial training will be conducted one time for each exam failed or for students experiencing difficulty mastering objectives.

APPENDIX C

MASTER LESSON FILE (MLF) CHECKLISTS

APPENDIX C is comprised of the following checklists. Additional items may be added to the checklists as required.

a. **Master Lesson File Checklist.** This checklist provides a list of documents and checklists that can be placed in the Master Lesson File (MLF).

b. **Learning Analysis Worksheet (LAW) Checklist.** This checklist is used during the Design Phase to evaluate the products of the learning analysis. The LAW is a required item for the MLF.

c. **Learning Objective Worksheet (LOW) Checklist.** This checklist is used during the Design Phase to evaluate the learning objectives. The LOW is a required item for the MLF.

d. **Test Item Checklist.** This checklist is used during the Design Phase to evaluate the test items. The test itself is usually kept in a secure place. However, the test item checklist can be placed in the MLF. It is not a required item.

e. **Delivery System Checklist.** This checklist is used during the Design Phase to ensure that the delivery system selected is compatible. The checklist is placed in the MLF, but it is not a required item.

f. **Concept Card Checklist.** This checklist is used during the Develop Phase to evaluate the items on the concept card. The concept card is a required item to be placed in the MLF.

g. **Operational Risk Assessment (ORA) Worksheet Checklist.** This checklist is used during the Develop Phase to evaluate the items on the ORA Worksheet. The ORA Worksheet is a required item to be placed in the MLF.

h. **Lesson Plan Checklist.** This checklist is used during the Develop Phase to evaluate the lesson plan. The lesson plan is a required item to be placed in the MLF.

i. **Student Outline/Student Supplementary Materials Checklist.** This checklist is used during the Develop Phase to evaluate the student outline and student supplementary materials (if applicable). The student outline and all supplementary materials are required to be place in the MLF.

j. **Media Checklist.** This checklist is used during the Develop Phase to evaluate the applicability of the method and media. The media is required to be placed in the MLF.

k. **Instructor Preparation Guide (IPG) Checklist.** This checklist is used during the Develop Phase to evaluate whether the necessary elements have been included in the Instructor Preparation Checklist. It also ensures that the information provided is in accordance with the Concept Card. The IPG is a required item to be placed in the MLF.

OTHER COURSE DEVELOPMENT CHECKLIST

l. **Construct a Test Checklist.** This checklist is used during the Develop Phase to evaluate the construct of a test. The test itself must be kept in a secure place. This checklist is not a required item for the MLF.

m. **Course Descriptive Data (CDD)/Program of Instruction (POI) Checklist.** This is a checklist used during the Develop Phase that evaluates the information on the CDD/POI. The CDD/POI is a separate product from the MLF. This checklist is maintained with the CDD/POI.

MASTER LESSON FILE CHECKLIST	
MASTER LESSON FILE REQUIRED ITEMS	
1. Learning Analysis Worksheet Checklist	YES NO
2. Learning Analysis Worksheets	YES NO
3. Learning Objective Worksheet Checklist	YES NO
4. Learning Objective Worksheet	YES NO
5. Test Item Checklist	YES NO
6. Method and Media Selection Checklist	YES NO
7. Concept Card Checklist	YES NO
8. Concept Card	YES NO
9. Operational Risk Assessment Worksheet (ORAW) Checklist	YES NO
10. Operational Risk Assessment Worksheet (ORAW)	YES NO
11. Lesson Plan Checklist	YES NO
12. Lesson Plan	YES NO
13. Student Outline/Student Supplementary Materials Checklist	YES NO
14. Student Outline	YES NO
15. Student Supplementary Materials	YES NO N/A
16. Media Checklist	YES NO
17. Media (paper copy or explanation of where the media is located)	YES NO
18. Instructor Preparation Guide (IPG) Checklist	YES NO
19. Instructor Preparation Guide (IPG)	YES NO
OTHER COURSE DEVELOPMENT ITEM/CHECKLIST	
20. Test*	YES NO
21. Test Checklist	YES NO

* The test needs to be maintained in a secure place with limited access. Therefore, it is recommended that this item be placed somewhere other than the MLF.

Remarks:

LEARNING ANALYSIS WORKSHEET CHECKLIST	
1. Is the LAW dated when analysis occurred?	YES NO
2. Is the Task Designator/Event Code recorded from the ITS/T&R?	YES NO
3. Is the Task Behavior/Event Description recorded from the ITS/T&R?	YES NO
4. Is the Condition recorded from the ITS/T&R (paper-based only)?	YES NO N/A
5. Is the Standard recorded from the ITS/T&R (paper-based only)?	YES NO N/A
6. Are the performance steps verbatim from the ITS/T&R?	YES NO
7. Is there at least one KSA for each performance step?	YES NO
8. Are all knowledge and skills worded properly? ("Know how to..., Be able to...")	YES NO
9. Are the grouped KSAs appropriate? (If the "grouping" is appropriate, the student will exhibit a single behavior that proves mastery of all the KSAs for that group.)	YES NO
10. Are <u>all</u> groupings annotated with a designator and a draft behavior statement?	YES NO
11. Which of the following methods were used to sequence the groups? (Circle <u>all</u> that apply.)	
a. Whole to part	
b. Part to whole	
c. Simple to complex	
d. Complex to simple	
e. Chronological (History)	
f. Sequential	
g. Cause and Effect order	
h. Critical	
i. Known to unknown	

Remarks:

LEARNING OBJECTIVE WORKSHEET CHECKLIST	
1. Are the LOW's dated (if using paper-based LOW)?	YES NO NA
TERMINAL LEARNING OBJECTIVE	
2. Was a TLO developed from the ITS/T&R?	YES NO
3. Are the TLO condition(s) valid for the school?	YES NO
4. Is the condition realistic? (Can school provide?)	YES NO
5. Is the TLO behavior verbatim from ITS/T&R?	YES NO
6. If TLO behavior has been modified, is there a downgrade justification explaining why (i.e. due to resource constraints)?	YES NO N/A
7. Are the TLO standard(s) valid?	YES NO
8. Is the standard realistic? (Considering what is taught, can the student perform at this level?)	YES NO
ENABLING LEARNING OBJECTIVES	
9. Was an ELO developed for each group of KSA's on the LAW?	YES NO
10. Is an alpha designator assigned to all ELO's?	YES NO
11. Is the task behavior verbatim from the LAW?	YES NO
12. Is the task designator verbatim from the LAW?	YES NO
13. Are the LO's written using proper grammar?	YES NO
14. Do LO's possess a single action verb?	YES NO
15. Do LO's possess a single object?	YES NO
16. Is the behavior observable and measurable?	YES NO
17. If not, is there a modifier/qualifier ensuring an observable/measurable product?	YES NO N/A
18. Is the condition consistent with the behavior?	YES NO
19. Does the condition describe the environment?	YES NO N/A
20. Does the condition describe aiding/limiting factors?	YES NO N/A
21. Is the standard consistent with the behavior?	YES NO
22. Does the standard tell how well the student has to perform?	YES NO
23. Are the LO's clear and concise?	YES NO

Remarks:

TEST ITEM CHECKLIST	
1. Do the test items replicate the conditions of the LO?	YES NO
2. Do the test items replicate the standards of the LO?	YES NO
3. Do the test items avoid measuring common knowledge?	YES NO
4. Do the test items avoid common sense answers?	YES NO
5. Does the student perform the behaviors as they are stated in the LO's?	YES NO N/A
6. Are the test items constructed in the proper format?	YES NO
7. Are the test items free from ambiguity?	YES NO
8. Are the test items closed to interpretation?	YES NO
9. Do the test items avoid opinions?	YES NO N/A
10. Are the test items free of repeated words or phrases?	YES NO
11. Does the test item avoid the use of absolutes (e.g. never, always)?	YES NO
12. Are the test items written using proper grammar?	YES NO
13. Is the test item as concise as possible?	YES NO
14. Are the test items or their location annotated on the LOW's?	YES NO
15. Are the answers (or their location) to the test items annotated on the LOW's?	YES NO N/A
16. If a performance-based test item, are there detailed instructions to the evaluator?	YES NO N/A
17. If a performance-based test item, are there detailed instructions to the student?	YES NO N/A
18. If a performance-based test item, do the detailed instructions to the evaluator identify the characteristics of a good product?	YES NO N/A

Remarks:

METHOD AND MEDIA SELECTION CHECKLIST	
1. Is the method selection consistent with the learning objective behavior?	YES NO
2. Is the media selection consistent with the learning objective behavior?	YES NO
3. Is the method selection consistent with the level of learning?	YES NO
4. Is the media selection consistent with the level of learning?	YES NO
5. Is the media selected appropriate for the class size?	YES NO
6. Is the method appropriate for the class size?	YES NO
7. Is the method appropriate for the task(s)/topic?	YES NO
8. Is the method and media (combined) appropriate for the target population?	YES NO
9. Does the method and media (combined) compliment different learning styles (auditory, visual, and tactile)?	YES NO
10. Does the method provide students the opportunity to practice their skills in a safe environment?	YES NO N/A
11. Is the method reflective of how the student will be evaluated?	YES NO N/A
12. Are the resources required to implement the method available to the school?	YES NO
13. Are the resources required to implement the media available to the school?	YES NO

Remarks:

CONCEPT CARD CHECKLIST	
1. Is the course title listed?	YES NO
2. Is the appropriate annex listed? (check school S.O.P.)	YES NO
3. Is the lesson ID correct?	YES NO
4. Is the lesson title the same as listed on the course structure document?	YES NO
5. Do the total hours for the concept card match the course structure document?	YES NO
6. Are all methods and hours listed?	YES NO
7. Is the student:instructor ratio appropriate for the method?	YES NO
8. Are all forms of media listed? (not required for admin concept card)	YES NO N/A
9. Are ammunition requirements listed?	YES NO N/A
10. Are there explanatory notes that clarify information on the concept card or list additional resources required?	YES NO
11. Are ALL the references used to write the lesson listed?	YES NO
ACADEMIC CONCEPT CARD ONLY **(Task oriented, lesson purpose or exam)**	
12. Does the concept card contain ALL objectives or a lesson purpose statement?	YES NO
13. Are the learning objectives listed in the order that they will be taught or evaluated? (not applicable if lesson purpose)	YES NO N/A
14. If this is an exam concept card, is there a re-test concept card as well?	YES NO N/A
ADMINISTRATIVE CONCEPT CARD ONLY	
15. Does the concept card describe the event in sufficient detail (e.g., check in, check out, graduation)?	YES NO
16. Is this concept card in Annex Z?	YES NO

Remarks:

OPERATIONAL RISK ASSESSMENT (ORA) WORKSHEET CHECKLIST	
1. Is the lesson title and lesson designator on the ORA worksheet?	YES NO
2. Are all learning objective behaviors listed?	YES NO
3. Are sub-steps to the learning objective behaviors listed?	YES NO NA
4. Have hazards been listed for the learning objective behaviors/sub-steps?	YES NO NA
5. Have realistic controls been formulated for all listed hazards? (Available resources must be considered.)	YES NO NA
6. Do the controls change the RAC code to an acceptable level?	YES NO NA
7. Is it explained on the ORA worksheet how to implement the controls?	YES NO NA
8. Is it explained on the ORA worksheet how to supervise?	YES NO N/A
9. Is the Cease Training Criteria (CTC) provided?	YES NO N/A
10. Is there an approving signature and date on the ORA Worksheet?	YES NO

Remarks:

LESSON PLAN CHECKLIST

TITLE PAGE	
1. Is the school name and address present?	YES NO
2. Is the document's title (lesson plan) present?	YES NO
3. Is the lesson title present?	YES NO
4. Is the lesson designator (ID) present?	YES NO
5. Is the course title present?	YES NO
6. Is the course identification number present?	YES NO
7. Is the originating/revision date of lesson present?	YES NO
8. Is an approval signature present?	YES NO
INTRODUCTION	
1. Does the Gain Attention:	
a. Relate to the lesson?	YES NO
b. Detract from the lesson?	YES NO
c. Provide WIIFM for student?	YES NO
d. Establish rapport?	YES NO
2. Does the Overview:	
a. Contain the conceptual framework?	YES NO
b. Describe the purpose of the lesson?	YES NO
c. Relate to other instruction? (Recall previous learning)	YES NO
3. Are the Learning Objectives:	
a. Noted in an instructor note for the instructor to introduce? (i.e. Students to read the LO's to themselves)	YES NO
b. Verbatim from the Concept Card?	YES NO
4. Does the Method/Media:	
a. Tell how the class will be presented?	YES NO
b. Is there an instructor note mentioning the Instructional Rating Form (IRF)?	YES NO

5. Does the Evaluation:	
a. State how the student will be evaluated (tested)?	YES NO
b. Tell the student when they will be evaluated (tested)?	YES NO
6. Are safety issues explained?	YES NO
7. Is there a transition to the body?	YES NO
BODY	
1. Are the main ideas in the same sequence as the learning objectives?	YES NO N/A
2. Do methods, other than lecture, provide:	
a. General information about the method including the amount of time that the method will take to execute?	YES NO
b. Detailed instructions for what the student's role will be?	YES NO
c. The instructor's role.	YES NO
■ Provide Safety Brief (if applicable) to inform students of any safety precautions related to the exercise and what to do if there's a mishap.	YES NO N/A
■ Provide Supervision and Guidance instructions to describe what the instructor is to be doing (i.e. moving about the room, assisting students, answering questions).	YES NO
■ Provide Debrief (if applicable) instructions to comment on what was observed, provide overall feedback, additional guidance, and review learning points.	YES NO N/A
3. Do Time Cues:	
a. Exist for each Main Heading? (Intro, Body, Summary)	YES NO
b. For the Main Headings add up to the lesson time on the concept card?	YES NO
c. Exist for each Main Idea?	YES NO
d. Exist for methods that are not executed within a main idea? (There is no time cue required for a method that is within a main idea).	YES NO N/A
e. For the main ideas, methods (if method is not a part of a main idea), and breaks (that fall between main ideas) add up to the time cue for the Body?	YES NO N/A
f. Stand out from normal text?	YES NO N/A
4. Do/Are Media Cues:	
a. Stand out from normal text?	YES NO N/A

b. Identified by a number designator?	YES NO N/A
5. Are Break Cues written into the lesson?	YES NO N/A
6. Are Instructor Notes:	
a. Placed where needed throughout the lesson?	YES NO
b. Clear and concise?	YES NO
7. Are Transition(s):	
a. Between each main idea?	YES NO
b. Does the transition summarize the last main idea, probe, and introduce the next main idea?	YES NO
c. Between the last main idea and summary?	YES NO N/A
8. Are Interim Transition(s):	
a. Between the demo/practical application sessions?	YES NO N/A
b. Before and after breaks?	YES NO N/A

SUMMARY	
1. Does the Summary review the main ideas?	YES NO
2. Review each main idea without re-teaching?	YES NO
3. Refrain from presenting any new material?	YES NO
4. Provide closure? (Reaffirm importance of content.)	YES NO
5. Provide closing instructions?	YES NO
6. Contain instructions for Instructional Rating Forms (IRF)?	YES NO
ENTIRE CLASS	
1. Is the lesson detailed enough that all information can be covered by a first-time instructor?	YES NO

Remarks:

STUDENT OUTLINE CHECKLIST	
1. Learning Objectives - Are they verbatim from the concept card?	YES NO
2. Outline – Does it follow conceptual framework?	YES NO
3. References – are all the references used in the lesson annotated on the last page?	YES NO
4. Is the student outline written as if addressing the student?	YES NO
5. Is the font size at least 10?	YES NO
6. Is the text easy to read?	YES NO
7. Is there ample white space (margins) for the student to take notes?	YES NO
8. Do exercises or activities match those in the lesson plan?	YES NO N/A
SUPPLEMENTAL STUDENT MATERIALS	
1. Is the material relevant to the learning objectives?	YES NO
2. If intended as a job aid, is it durable (e.g. laminated)?	YES NO

Remarks:

MEDIA CHECKLIST	
1. Does the media enhance the information in the lesson plan?	YES NO
2. Is the alignment used appropriate to the type of media?	YES NO
3. Is the use of upper-case lettering minimized (only used for titles or to highlight text)?	YES NO
4. Are the images used related to the content?	YES NO
5. Does the page or frame refrain from clutter/image overload?	YES NO
6. Do the colors contrast well?	YES NO N/A
7. Is the appropriate level of vocabulary used?	YES NO
8. Has the media been checked for spelling and grammar?	YES NO
9. Do terms in the media match terms in the student outline?	YES NO
PRINT MEDIA	
10. Is the font size at least 10?	YES NO
11. Is the text style consistent (headings, text, etc.)?	YES NO
12. Is the format/layout consistent (spacing)?	YES NO
13. Is there ample white space (margins)?	YES NO
14. Is the text easy to read?	YES NO
PROJECTED MEDIA	
15. Are sans serif fonts (without finishing strokes) used?	YES NO
16. Is the font size large enough to be seen by all (at least 24 for projected media)?	YES NO
17. Is information bulleted using key words and phrases?	YES NO
18. Are no more than six words a line and six lines (6X6 rule) per visual used?	YES NO
19. Is the animation distracting within the presentation?	YES NO N/A
20. Is the sound distracting within the presentation?	YES NO N/A
21. Is the layout consistent throughout the presentation?	YES NO

Remarks:

INSTRUCTOR PREPARATION GUIDE (IPG) CHECKLIST	
1. Is the lesson title the same as on the concept card?	YES NO
2. Is the lesson designator the same as on the concept card?	YES NO
3. Is the total lesson time the same as on the concept card?	YES NO
4. Are all references the same as on the concept card?	YES NO
5. Is the location of tests identified?	YES NO
6. Are all personnel required the same as on the concept card?	YES NO
7. Are all facilities required the same as on the concept card?	YES NO
8. Are all course materials that need to be reviewed listed?	YES NO
9. Is there a step to personalize the lesson plan?	YES NO
10. Are all materials and equipment needed to conduct the lesson listed?	YES NO
11. Are there detailed instructions for the setup and planning of each exercise?	YES NO
12. Are all safety precautions related to lesson listed?	YES NO

Remarks:

TEST CHECKLIST	
1. Does it contain detailed instructions to the instructor?	YES NO N/A
2. Are there instructions to the evaluator concerning scoring?	YES NO
3. Does it contain detailed instructions to the student?	YES NO
4. Are there instructions covering the consequences of cheating?	YES NO
5. Does it state the safety precautions?	YES NO
6. Is the purpose of this test clear?	YES NO
PERFORMANCE-BASED TEST	
7. Does it identify the task to be completed?	YES NO
8. Does it contain a checklist of steps to be evaluated OR criterion of a good product?	YES NO
KNOWLEDGE-BASED TEST	
9. Are there an appropriate number of test items for each objective?	YES NO
10. Are all like test items grouped by type (Fill-in–the–blank, multiple choice, etc...)?	YES NO
11. Have they been compared to the rest of the test to ensure they are:	
a. Free of hints?	YES NO
b. Not repeated elsewhere?	YES NO
c. Consistent in format with like test items?	YES NO
12. Are items on the test verbatim from the LOW's?	YES NO
13. Is this test valid? (Does it measure what it is supposed to measure?)	YES NO
14. Is this test usable? (easy to administer, score and interpret the results)	YES NO

Remarks:

COURSE DESCRIPTIVE DATA (CDD)/PROGRAM OF INSTRUCTION (POI)	
1. Does the POI contain a title page?	YES NO
2. Does the POI contain a certification page?	YES NO
3. Does the POI contain a record of changes page?	YES NO
4. Does the POI contain a preface page?	YES NO
5. Does the preface have a narrative of the purpose for the course?	YES NO
6. Does the preface include information regarding graduates?	YES NO
7. Does the preface include a point of contact for recommended course changes?	YES NO
8. Does the POI contain a course descriptive data (CDD)?	YES NO
9. Does the POI contain a table of contents?	YES NO
10. Does the CDD reflect the Course Title?	YES NO
11. Does the CDD reflect the school name and address?	YES NO
12. Does the CDD reflect the Course ID?	YES NO
13. Does the CDD purpose identify the course intent?	YES NO
14. Does the CDD scope identify all areas of instruction?	YES NO
15. Is the mobilization length justified?	YES NO
16. Does the course length equate to the curriculum breakdown?	YES NO
17. Does the CDD reflect the Max Class Capacity?	YES NO
18. Does the CDD reflect the Min Class Capacity?	YES NO
19. Does the CDD reflect the Optimum Class Capacity?	YES NO
20. Does the CCD reflect the Class Frequency?	YES NO
21. Does the CDD reflect Student Prerequisites?	YES NO
22. Does the CDD reflect the Quota Control?	YES NO

23. Does the CDD reflect the Funding Agency?	YES NO
24. Do Reporting Instructions contain Messing and Billeting notes?	YES NO
25. Are the Supervisor and Instructor billets identified?	YES NO
26. Are Instructor Staffing notes present?	YES NO
27. Are the School Overhead billets identified?	YES NO
28. Are School overhead notes present?	YES NO
29. Does the CDD contain Appendix A-Instructor Computation Worksheet (ICW)?	YES NO
30. Does the CDD's Appendix A contain accurate information?	YES NO
31. Does the ICW require any further explanatory notes?	YES NO
32. Are the notes clear and concise?	YES NO
33. Does the POI contain Section II-Summary of Hours?	YES NO
34. Are the Summary of Hours broken down correctly?	YES NO
35. Does the total time justify the total number of training days?	YES NO
36. Does each annex have its appropriate total time?	YES NO
37. Does the POI contain Section III-Scope of Annexes?	YES NO
38. Does the Scope of Annexes define the purpose of each?	YES NO
39. Does Section IV contain a location of Learning Objectives Report?	YES NO
40. Does Section IV contain an Academic Summary?	YES NO
41. Does the Academic Summary justify the total academic/administrative time?	YES NO
42. Does section IV contain all the concept cards?	YES NO
43. Is a concept card developed for each lesson, administrative event, and exam?	YES NO
44. Do the concept cards contain notes that clarify activity?	YES NO
45. Does the POI contain a Section V-Student Performance Evaluation?	YES NO
46. Does Section V contain statements that describe the purpose of the student's evaluation?	YES NO

47. Does Section V contain statements that describe the method(s) of the student's evaluation?	YES NO
48. Does Section V contain statements that that describe the remediation?	YES NO
49. Does Section V contain statements that describe what happens if the student fails remediation?	YES NO
50. Does the POI contain a Section VI-Distribution List?	YES NO
51. Does the Distribution List contain the agencies, which the POI is to be distributed?	YES NO

Remarks:

APPENDIX D

SAMPLE QUESTIONNARIES

APPENDIX D is comprised of the following evaluation questionnaires. Additional items may be added to the questionnaires as required.

a. **Instructional Rating Forms (IRF's).** This questionnaire is a student reaction form completed by at least 10 percent of the students immediately following each lesson.

b. **Examination Rating Forms (ERF's).** This questionnaire is a student reaction form completed by at least 10 percent of the students immediately following each examination.

c. **End of Course Critiques (ECC's).** This questionnaire is student reaction form completed by 100 percent of the students at the end of a course.

d. **Post Graduate Survey.** This questionnaire is sent (i.e. emailed, mailed, available online) to course graduates approximately 3 months following completion of the course.

e. **Post Graduate Supervisor Survey.** This questionnaire is sent (i.e. emailed, mailed, available online) to the supervisors of course graduates approximately 3 months following the graduate's completion of the course.

f. **Safety Questionnaire**. This questionnaire is a student reaction form that provides the student with an opportunity to assess whether he/she has been informed about safety issues.

INSTRUCTIONAL RATING FORM

One way instruction is improved is by sampling student reaction to the instruction. To assist in improving this lesson, please answer the following questions. This will assist the school in improving our courses.

Instructor: **Date:**

Course: **Lesson:**

INSTRUCTIONS: Circle the answer that indicates your level of agreement or disagreement as follows: **Strongly Disagree = 1, Disagree=2, Agree=3, and Strongly Agree=4.** Please explain in the section labeled comments any ratings of 1 or 2. If the question is not applicable, then circle **NA**.

1. INSTRUCTOR	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**	**NA**
a. The instructor showed a thorough knowledge of the lesson material.	1	2	3	4	NA
b. The instructor communicated the lesson material in a way that could be easily understood.	1	2	3	4	NA
c. The instructor gave precise instructions concerning in-class exercises.	1	2	3	4	NA
d. The instructor encouraged student participation.	1	2	3	4	NA
e. Student's questions were answered in a professional (not demeaning to the student) manner.	1	2	3	4	NA
2. LESSON CONTENT					
a. The content was presented at the right pace.	1	2	3	4	NA
b. The student outline aided my understanding of the content covered.	1	2	3	4	NA
c. The environment of the class was interactive.	1	2	3	4	NA
3. SAFETY					
a. Lesson related safety to job performance.	1	2	3	4	NA
b. Cease Training procedures were adequately explained.	1	2	3	4	NA
c. Safety precautions were reemphasized prior to commencing tasks.	1	2	3	4	NA
d. Safety was paramount at all times.	1	2	3	4	NA
e. Equipment/material was safe for use.	1	2	3	4	NA
4. METHODS/MEDIA:					
a. The in-class exercises required in the course were worthwhile learning experiences.	1	2	3	4	NA
b. The way that the class material was presented enhanced my ability to learn/perform the concept/task. I especially liked the _____ method.	1	2	3	4	NA
c. The media complimented instruction.	1	2	3	4	NA
5. STUDENT: Circle the answer that best describes your knowledge level.					
a. My knowledge of the content prior to this class was	None	Very Little	Average	Above Average	Expert
b. My knowledge of the content after completing the class was	None	Very Little	Average	Above Average	Expert

Name_____ **Parent Unit:** _____

Overall Comments/Suggestions for the Class (use back of form if more space is needed):

_____

_____

_____

EXAMINATION RATING FORM

One way that we improve the examination process is by sampling student reaction to the examination. To assist in improving this process, please answer the following questions. These forms will not be viewed until after all tests have been scored and returned.

Name: **Date:**

Course: **Exam:**

A. INSTRUCTIONS: Circle the answer that indicates your level of agreement or disagreement as follows: **Strongly Disagree = 1, Disagree= 2, Agree=3, and Strongly Agree=4.** Please explain in the section labeled comments any ratings of 1 or 2. If the question is not applicable, then circle NA.

PRIOR TO TEST:	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A
1. Test instructions were clear and concise.	1	2	3	4	N/A
2. I was allowed the opportunity to ask questions.	1	2	3	4	N/A
3. The time allowed for testing was indicated prior to the start of the test.	1	2	3	4	N/A
4. The instructor indicated what materials could be used during testing.	1	2	3	4	N/A
DURING THE TEST:					
5. Distractions were minimal.	1	2	3	4	N/A
6. I was aware of the time remaining to complete the test.	1	2	3	4	N/A
7. Unfair advantage was not given to any other student during the test.	1	2	3	4	N/A
8. A monitor was present at all times during the test.	1	2	3	4	N/A

B. INSTRUCTIONS: If you have taken a **written test**, please answer questions 9-11. If you have taken a **performance test**, please answer questions 12-18. If you are unsure of your test type, ask the test proctor.

WRITTEN TEST *ONLY*:					
9. All materials (pen, paper, etc.) necessary for the test were available.	1	2	3	4	N/A
10. Questions were written in a way that I could understand.	1	2	3	4	N/A
11. The information I was tested on was covered in class.	1	2	3	4	N/A
PERFORMANCE TEST *ONLY*:					
12. I had sufficient practice time prior to the test.	1	2	3	4	N/A
13. All equipment necessary for the test was accessible.	1	2	3	4	N/A
14. The skills/information I was tested on were covered sufficiently in class.	1	2	3	4	N/A
15. Performance task requirements were effectively communicated.	1	2	3	4	N/A
16. Safety precautions were reemphasized prior to commencing tasks.	1	2	3	4	N/A
17. Equipment/material was safe for use.	1	2	3	4	N/A
18. Cease Training procedures were adequately explained.	1	2	3	4	N/A

Circle your answer.

19. Prior to the test, I studied:	Less Than 1 Hour	1-2 Hours	2-3 Hours	More than 3 Hours	Did Not Study

Check (X) yes or no. If answer is yes, please indicate subject areas.	**YES**	**NO**
20. Was there any portion of the test that you believe should have been covered more thoroughly during class/practical application? If so, please indicate the subject areas.		

_____

_____

Other Comments (Please explain any questions rated 1 or 2): (REMARKS ON BACK)

POST GRADUATE SURVEY

_____Course

Instructions: This questionnaire is designed to gather information to evaluate the effectiveness of the _____ Course in preparing you for your current duty assignment. Please respond to all questions and return the completed questionnaire by (email or mail).

SECTION I. PERSONAL DATA - Please fill in appropriate data.

Name	Rank	Graduation Month/Year
Billet	MOS	
DSN number for contact	Email	

SECTION II: TASK TRAINING

The tasks listed below presently receive some emphasis in the course. Please rate each task/knowledge on the scales at the right in terms of its importance to your current job and the adequacy of training received by **bolding** or highlighting the most appropriate number. (Level of Preparedness scale may be skipped if the task has never been performed on the job.)

TASK/KNOWLEDGE	FREQUENCY	LEVEL OF PREPAREDNESS
INSTRUCTIONS: BOLD or Highlight the number that applies.	1- Daily 2- Weekly 3- Monthly 4- Never	1- Not at all prepared 2- Somewhat prepared 3- Prepared 4- Well-prepared 5- Very well prepared
(List tasks required in the course HERE)	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5

(Add additional pages if needed)

(Additional sections may be added to provide specific information for the school, i.e. type of equipment being used in the FMF, procedures being followed in the FMF)

SECTION III: COMMENTS AND RECOMMENDATIONS

This section allows you to provide additional information and comments regarding the effectiveness of the course in preparing you for your current job. Please record your response in the spaces provided. (Attach additional sheets if more space is required.)

1. Are there tasks you are required to perform on your job that were not covered in the course? If so, list the tasks and briefly describe your duties.

2. What recommendations do you have for training tasks you feel were not covered adequately in the course?

3. If you feel some tasks listed need not be trained in the formal school, please list them here and explain your reasons.

4. Do you believe you benefited from this course? If so, how? If not, why not?

5. How can we improve this course for future students? (Consider present/future procedure and equipment changes.)

Additional Comments:

POST GRADUATE SUPERVISOR SURVEY

_____(Course Name)_____Course

Instructions: This questionnaire is designed to gather information to evaluate the effectiveness of the ____(Course Name)_____ Course in preparing graduates for future duty assignments. Please respond to all questions and return the completed questionnaire by (email or mail).

SECTION I. PERSONAL DATA - Please fill in appropriate data.

Graduate's Name	Rank	Graduation Month/Year		
Graduate's Billet	Type of Unit		MOS	
DSN number for contact	Email			
How long have you served in your current billet? (**Bold** or highlight one)	0-6 mths	7-12 mths	13-18 mths	Over 18 mths

SECTION II: TASK TRAINING

The tasks listed below presently receive some emphasis in the course. Please rate each task/knowledge on the scales at the right in terms of its importance to the graduate's current job and the adequacy of training received by **Bolding** or highlighting the most appropriate number. (Level of Preparedness scale may be skipped if the task has never been performed on the job.)

TASK/KNOWLEDGE	FREQUENCY	LEVEL OF PREPAREDNESS
INSTRUCTIONS: Bold or Highlight the number that applies.	1- Daily 2- Weekly 3- Monthly 4- Never	1- Not at all prepared 2- Somewhat prepared 3- Prepared 4- Well-prepared 5- Very well prepared
(List tasks required in the course HERE)	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5
	1 2 3 4	1 2 3 4 5

(Add additional pages if needed)

(Additional sections may be added to provide specific information for the school, i.e. type of equipment being used in the FMF, procedures being followed in the FMF)

SECTION III: COMMENTS AND RECOMMENDATIONS

This section allows you to provide additional information and comments regarding the effectiveness of the course in preparing the graduate for his current job. Please record your response in the spaces provided. (Attach additional sheets if more space is required.)

1. What recommendations do you have for training tasks you feel were not covered adequately in the course?

2. If you feel some tasks listed need not be trained in the formal school, please list them here and explain your reasons.

3. Do you believe the graduate benefited from this course? If so, how? If not, why not?

4. How can we improve this course for future students? (Consider present/future procedure and equipment changes.)

Additional Comments:

END OF COURSE CRITIQUE

The End of Course Critique provides the school with your reaction to the course you just completed. The information you provide us is treated confidentially and is used to improve the quality of instruction for the overall course. Thank you for your input.

COURSE: **DATE:**

STUDENT NAME:

A. Circle or highlight the rating that indicates your level of agreement or disagreement. Please comment on all ratings of 1 or 2. All comments are encouraged regardless of whether you agreed or disagreed.	**Strongly Disagree**	**Disagree**	**Neither Disagree or Agree**	**Agree**	**Strongly Agree**	
1. I had a clear understanding of what I would be required to learn or do in this course? (The learning objectives were clearly stated.) **COMMENTS:**	1	2	3	4	5	
2. I am confident that I have learned or can perform the tasks required by the learning objectives? **COMMENTS:**	1	2	3	4	5	
3. The written and performance exams tested my knowledge and/or ability to perform the learning objectives? **COMMENTS:**	1	2	3	4	5	
4. The quizzes/puzzles/games/review sessions, when used, increased my knowledge of the subject and prepared me for the tests. **COMMENTS:**	1	2	3	4	5	N/A
5. Class time was used to achieve the learning objectives. **COMMENTS:**	1	2	3	4	5	
6. The time allotted to cover each lesson was appropriate for what I was expected to learn. **COMMENTS:**	1	2	3	4	5	

7. Course length was appropriate for what was expected. **COMMENTS:**	1	2	3	4	5	
8. The overall schedule for the course flowed logically and was well-organized. **COMMENTS:**	1	2	3	4	5	
9. Student outlines, training aids (i.e. internet sites, graphs, charts, maps), and/or references were available. **COMMENTS:**	1	2	3	4	5	N/A
10. The student outlines, training aids (i.e. internet sites, graphs, charts, maps), and/or references used supported instruction. **COMMENTS:**	1	2	3	4	5	N/A
11. Student outlines aided my understanding of the material. **COMMENTS:**	1	2	3	4	5	N/A
12. Student outlines were easy to follow. **COMMENTS:**	1	2	3	4	5	N/A
13. The media (i.e. PowerPoint, models, posters) used supported instruction. **COMMENTS:**	1	2	3	4	5	N/A
14. Considering the amount of material covered during the course, there was sufficient time available on both in-class and out-of-class (if applicable) work. **COMMENTS:**	1	2	3	4	5	
15. The methods (i.e. lecture, demonstration, practical application, case study, group exercises) used to present course information helped me to understand the course material. **COMMENTS:**	1	2	3	4	5	
16. Instructors were knowledgeable and well-prepared. **COMMENTS:**	1	2	3	4	5	
17. The instructors responded effectively to questions and input. **COMMENTS:**	1	2	3	4	5	N/A

18. The instructors were professional. **COMMENTS:**	1	2	3	4	5	
19. The overall course gave me a thorough understanding of my duties in the operating forces and sufficient knowledge and skills to perform those duties. **COMMENTS:**	1	2	3	4	5	N/A
20. Instructors followed safety precautions at all times. **COMMENTS:**	1	2	3	4	5	N/A
21. Lessons on safety were included as applicable. **COMMENTS:**	1	2	3	4	5	N/A
22. Lessons related safety to job performance as applicable. **COMMENTS:**	1	2	3	4	5	N/A
23. Cease Training procedures were adequately explained as applicable. **COMMENTS:**	1	2	3	4	5	N/A
24. Emergency action procedures were adequately explained as applicable. **COMMENTS:**	1	2	3	4	5	N/A
25. Safety precautions were put in place prior to each event as applicable. **COMMENTS:**	1	2	3	4	5	N/A
B. Answer the following questions.						
26. Were there any particular lessons/blocks of instruction that were particularly confusing or could be improved? YES/NO -- If you responded yes, please explain.						

27. Were there any portions of the course where there was idle time (i.e. standing around, not focused)? YES/NO -- If you responded yes, please explain.

28. What is your overall evaluation of the instructors?

29. What is your overall evaluation of the course?

SAFETY QUESTIONNAIRE

INSTRUCTIONS: This checklist is to ensure that you, the student, have been properly advised of safety issues specific to this training. Your comments will help this school provide safe training, improved guidance to the instructional staff, and to address your concerns regarding safety measures.

LESSON TILE/PRACTICAL APPLICATION:

INSTRUCTOR: **DATE:**

A. Check the appropriate answer.	**YES**	**NO**
1. Did instructors follow safety precautions at all times?		
2. Were safety precautions explained prior to training?		
3. Were safety precautions reemphasized prior to practical applications and/or performance exam?		
4. Were Cease Training procedures adequately explained?		
5. Did the instructor explain the procedure to be taken in the event of a mishap?		
6. Was a safety brief included as applicable?		
7. Did the lesson relate safety to job performance?		
8. Were the tools and equipment in good working condition and safe to use?		
9. Was supervision available when performing potentially dangerous tasks?		
10. Was there encouragement to report any unsafe or unhealthy conditions?		

B. Circle the rating that indicates your level of agreement or disagreement.	**Strongly Disagree**	**Disagree**	**Strongly Agree**	**Agree**	**N/A**
9. I felt my safety was always a primary concern of the instructor.	1	2	3	4	N/A
10. I felt that the training environment was both safe and non-hazardous.	1	2	3	4	N/A

Additional Comments (Write number of reference and then comment):

STUDENT NAME: _____ DATE: _____

APPENDIX E

SAMPLE CHECKLISTS

APPENDIX E is comprised of the following evaluation checklists. Additional items may be added to the checklists as required.

a. **Standing Operating Procedures (SOP) Checklist.** This checklist is used as a job aid for writing an SOP.

b. **Instructor Evaluation Checklist.** This checklist is used during the Implement Phase to evaluate the instructor.

c. **Observation Checklist.** This checklist is used during the Implement Phase to evaluate the effectiveness of the course materials during the class.

d. **Environment Checklist.** This checklist is used during the Implement Phase to evaluate the instructional environment.

e. **Safety Review Checklist.** This checklist is used during the Implement Phase to evaluate how well safety measures have been employed.

SCHOOL SOP CHECKLIST

(The Marine Corps Directives System is the final authority on the requirements for writing an order.)

1. **Determine Contents**

   a. **Usability Information**

   ( ) Purpose
   ( ) Scope
   ( ) Background
   ( ) Recommendations
   ( ) Certification
   ( ) Distribution
   ( ) Locator Sheet
   ( ) Record of Changes
   ( ) Table of Contents
   ( ) Appendices
   ( ) Index

   b. **Non-Academic Information**

   ( ) Mission
   ( ) Organization
   ( ) Operations & General Information
   ( ) Facilities
   ( ) Billeting
   ( ) Messing
   ( ) Discipline
   ( ) Staff Development
   ( ) Turnover Files
   ( ) Transportation
   ( ) Safety/Operational Risk Management
   ( ) Administration and Logistics
   ( ) Field Exercises
   ( ) Inspections
   ( ) Daily Routine
   ( ) Physical Fitness

   c. **Academic Information**

   ( ) Job Analysis
   ( ) Design
   ( ) Development
   ( ) Methods and Media Selection
   ( ) Scheduling
   ( ) Master Lesson File
   ( ) Formats
   ( ) Validation
   ( ) Implementation
   ( ) Evaluation
   ( ) Course Content Review Board (CCRB)
   ( ) Mastery
   ( ) Graduation Requirements
   ( ) Remediation
   ( ) Programs of Instruction (POI)
   ( ) Course Description Data (CDD)
   ( ) Homework

INSTRUCTOR EVALUATION CHECKLIST

NAME: RANK: DATE:

COURSE: LESSON TITLE:

EVALUATION: ☐ Rehearsal 1 2 3 ☐ Presentation ☐ Certification (if applicable)
☐ Quarter 1 2 3 4

INSTRUCTIONS: Evaluate each item on the checklist as **YES, NI, (Needs Improvement), NO or NA (Not Applicable).**

1. INTRODUCTION	**YES**	**NI**	**NO**	**NA**	**COMMENTS**
a. Gain Attention. Presented effectively; relates to LO's					
b. WIIFM. Established need for students to listen.					
c. Overview. Identified purpose of lesson and main points.					
d. Learning Objectives. Introduced the learning objectives.					
e. Method/Media. Identified specific method(s)/media used.					
f. Administrative Instructions. IRF's, any other rules, etc.					
g. Evaluation. Identified how and when evaluation would occur.					
h. Transition. Closed introduction and opened main idea.					
i. Safety Brief (if applicable). Safety precautions/controls and Cease Training Criteria are explained.					
2. BODY	**YES**	**NI**	**NO**	**NA**	
a. Lesson Plan. Followed lesson plan.					
b. Examples. Clarified teaching points through use of examples.					
c. Transitions. Closed main idea and opened next.					
d. Probed. Used questions to check learning in transitions.					
3. SUMMARY	**YES**	**NI**	**NO**	**NA**	
a. Review Main Ideas. Reviewed conceptual framework.					
b. Provide Closure. Reaffirm importance of content.					
c. Closing Instructions. Clear and concise.					
4. PROBING/QUESTION & ANSWER TECHNIQUES	**YES**	**NI**	**NO**	**NA**	
a. Probing. Used probing questions throughout.					
b. Response. Responded effectively to student's questions/inputs.					
c. Response. Responded to areas of confusion.					
d. Questioning Techniques. Assessed student learning.					
5. FACILITATION TECHNIQUES	**YES**	**NI**	**NO**	**NA**	
a. Real World. Provided real world relevancy.					
b. Participation. Encouraged student participation.					
c. Interaction. Provided intellectual stimulation with students.					
d. Motivation. Used motivation techniques to monitor activity progress toward meeting lesson purpose.					
e. Focus. Established and maintained student attention.					
f. Instructions. Clear and concise for exercises/PA's					
6. METHOD	**YES**	**NI**	**NO**	**NA**	
a. Method employment. States purpose and desired outcome. Employs effectively.					
b. Safety Brief (if applicable). Safety precautions, Cease Training Criteria, and emergency action procedures are explained.					
c. Supervision and Guidance. Instructions and guidance to students is adequately provided.					
d. Debrief (if applicable). Overall feedback; review of learning points.					

7. MEDIA	**YES**	**NI**	**NO**	**NA**	
a. Set-up. Able to use equipment. Ensured students were able to see media.					
b. Employment. Media employed at the appropriate time.					
8. COMMUNICATION – Nonverbal	**YES**	**NI**	**NO**	**NA**	
a. Eye Contact. Evenly distributed, creating a "connection" with all students.					
b. Movement. Natural, smooth and coordinated with dialogue.					
c. Gestures/Mannerism. Avoided distracting mannerisms.					
d. Facial Expressions. Varied with mood and content, sincere, showed concern, reinforced and expressed pleasure.					
e. Appearance. Well-groomed, professional appearance.					
f. Nervousness. Controlled nervousness and anxiety.					
g. Barriers. Body language displays interest. Avoided emotionally-laden words.					
h. Enthusiasm. Displayed excitement.					
9. COMMUNICATION - Verbal	**YES**	**NI**	**NO**	**NA**	
a. Volume, Rate, Force, Inflection, and Pause. Natural and appropriately varied.					
b. Pronunciation, Articulation, Dialect. Easy to understand.					
c. Pet Words. Minimized.					
10. SAFETY	**YES**	**NI**	**NO**	**NA**	
a. Cease Training. Procedures were adequately explained.					
b. Safety Precautions. Followed safety precautions at all times.					
c. Equipment/Material. Safe for use.					
d. Safety Practices. Monitored students for good safety practices.					
11. CLASSROOM MANAGEMENT	**YES**	**NI**	**NO**	**NA**	
a. Classroom Arrangement. Properly arranged classroom.					
b. Time. Ideal use of time available.					

12. OVERALL INSTRUCTION

☐ SATISFACTORY ☐ UNSATISFACTORY

☐ SATISFACTORY, BUT NEEDS IMPROVEMENT

OTHER REMARKS COMPLETED BY THE EVALUATOR:

All behaviors evaluated as "NI" or "NO" will be explained under this section. Also include any comments of an outstanding nature.

SIGNATURE AND TITLE OF THE EVALUATOR
DATE

PRINTED NAME:

INSTRUCTOR IMPROVEMENT PLAN

I have been debriefed on this evaluation. I understand the areas that need improvement and will take the following action:

SIGNATURE AND TITLE OF INSTRUCTOR
DATE

OBSERVATION CHECKLIST

OBSERVATION CHECKLIST: An observer completes this checklist while observing the lesson. This checklist is designed as a source of quality control as well as evaluate the effectiveness of the materials during implementation.

INSTRUCTIONS: Check the appropriate box: YES, NO, or N/A. If you answer "NO" to a question, note the item number with a comment for clarification and state a recommendation.

COURSE:

OBSERVER/TITLE: **DATE:**

A. COURSE MATERIAL	**YES**	**NO**	**N/A**
1. Is the lesson plan the instructor uses the same as in the MLF?			
2. Is the student outline the student uses the same as in the MLF?			
3. Is the media the same as in the MLF? (Any modifications should be noted.)			
4. Are all supplemental student materials used the same as in the MLF?			
5. Are adequate directions for all supporting materials used located in the MLF?			
6. Has Operation Risk Assessment Worksheet (ORAW) been updated within the last year?			
7. Is the ORAW still accurate?			
8. Is the Instructor Preparation Guide still accurate?			
B. LESSON PLAN	**YES**	**NO**	**N/A**
9. Is the Gain Attention relevant to the learning objectives?			
10. Does the lesson being taught reflect a logical sequence of the material?			
11. Based upon viewing the lesson, are the lesson plans written with sufficient content so that any instructor can teach the class if needed?			
12. Do the instructor notes provide sufficient directions for the instructor?			
13. Are the activities/exercises in the lesson meaningful? (Do students seem to be learning from them?)			
14. Are the activities/exercises appropriately placed in the lesson?			
15. Are the method(s) effective to teaching the lesson content?			
16. Is the method used to teach students reflective of how students will be evaluated?			
C. STUDENT MATERIALS	**YES**	**NO**	**N/A**
17. Are the student materials easy to read?			
18. Are the student materials easy to follow?			
19. Can the students take the materials home?			
20. Are the students using the materials?			
D. MEDIA	**YES**	**NO**	**N/A**
21. Is the media visually appealing?			
22. Is the media large enough for all to see?			
23. Does the media compliment the lesson?			
E. FACILITIES/EQUIPMENT			
24. Are the facilities used conducive to the type of training?			
25. Is the equipment used adequate for the purposes of training?			

Comments/Recommendation (Write item number and then comment/recommendation):

OBSERVER SIGNATURE: _____ **DATE:** _____

LESSON TITLE: _____

ENVIRONMENT CHECKLIST

ENVIRONMENT CHECKLIST: An instructor or an observer can complete this checklist. An instructor may use the checklist to ensure classroom management. An observer may use it to evaluate the management of the instructional environment.

INSTRUCTIONS: Check the appropriate box: YES, NO or N/A (not applicable). If you answer "NO" to a question, note the item number with a comment for clarification and state a recommendation.

COURSE:

INSTRUCTOR/OBSERVER: **DATE:**

A. TRAINING ENVIRONMENT	YES	NO	N/A
26. Is the instructional area well-ventilated (i.e. heat, hazardous fumes)?			
27. Is the lighting sufficient in the instructional area for the instruction and/or task?			
28. Is the temperature comfortable?			
29. Is noise minimized?			
30. Are distractions minimized?			
31. Are safety signs (i.e. hard hat area, welding in progress) visibly posted?			
32. Is safety equipment available and/or being used?			
33. Is the training facility clean?			
34. Is there adequate space for planned activities?			
35. Is the facility set up so that all students can view media, demonstrations, etc?			
B. TRAINING CONDITIONS	**YES**	**NO**	**N/A**
36. Are training aids and equipment operating effectively?			
37. Do training support personnel perform their duties properly?			
38. Is the support appropriate to requirements?			
C. VISITOR/OBSERVER PREPARATION	**YES**	**NO**	**N/A**
39. Is there a designated place for an observer station?			
40. Is there a Visitor/Observer Folder available in accordance with SOP policy?			

Comments/Recommendations (Write item number and then comment/recommendation):

INSTRUCTOR/OBSERVER SIGNATURE: _____ DATE_____

LESSON/PRACTICAL APPLICATION TITLE: _____

SAFETY REVIEW CHECKLIST

SAFETY REVIEW CHECKLIST: An instructor or an observer can complete this checklist. An instructor may use it in preparation for a lesson/practical application. An observer may use it to ensure that safety concerns are addressed appropriately and in accordance with Operation Risk Management. (Safety procedures/measures include, but are not limited to, heat stress control procedures, respiratory protection, sight protection, hearing protection, hand protection, head protection, foot protection, etc.)

COURSE:

INSTRUCTOR/OBSERVER: **DATE:**

INSTRUCTIONS: Check the appropriate box: YES, NO, or N/A. If you answer "NO" to a question, note the item number with a comment for clarification and state a recommendation.

COMPLETE AS APPLICABLE	YES	NO	N/A
41. Instructor training completed.			
42. Instructors are present in sufficient numbers to prevent accidents during potentially hazardous or dangerous situations.			
43. Facilities ensure a safe working environment.			
a. Inspections of fire extinguishers are up to date.			
b. Exits are labeled and accessible.			
c. Area has appropriate ventilation for fumes			
44. An Operational Risk Assessment Worksheet (ORAW) has been completed for the lesson and is located in the Master Lesson File (MLF).			
45. Hazard controls to eliminate or minimize potential risks are included in the instructor preparation guide and/or the detailed outline (lesson plan) for the lesson.			
46. Cease Training Criteria and procedures are thoroughly explained on the ORAW.			
47. Tools and equipment are in good working condition and safe to use.			
48. Training evolutions that require students to perform hazardous tasks are essential to accomplish learning objectives.			
49. Applicable safety procedures/protective measures are in place.			
50. A Training Safety Officer (TSO) has been assigned to high risk training events.			
51. Setback information (academic or personal issues) on students is available to the instructor.			

Comments/Recommendation (Write item number and then comment/recommendation):

INSTRUCTOR/OBSERVER SIGNATURE: _____ DATE: _____
LESSON/PRACTICAL APPLICATION TITLE: _____

APPENDIX F

AFTER INSTRUCTION REPORT (AIR)

APPENDIX F consists of a sample After Instruction Report (AIR). The AIR is used to summarize and compile information from Instructional Rating Forms, Examination Rating Forms, End of Course Critiques, and instructor comment regarding one lesson.

AFTER INSTRUCTION REPORT

INSTRUCTOR:	DATE:
LESSON TITLE:	COURSE NUMBER:
NUMBER OF IRFs:	NUMBER OF TUDENTS:

INSTRUCTIONS TO INSTRUCTOR: The Instructional Rating Form (IRF) allowed students to use a 1 to 4 rating scale with the level of agreement or disagreement as follows: Strongly Disagree = 1, Disagree = 2, Agree = 3, or Strongly Agree = 4. NA is on the IRF as an option for statements that are not applicable. For the After Instruction Report (AIR), calculate how many student(s) circled "1" and place that number in the blank under "1" beside the corresponding question. Follow the same procedure for the ratings of "2", "3", and "4". The instructor should address all negative responses ("1's" or "2's") under the instructor comments.

1. INSTRUCTOR: Questions related to the instructor.	**1**	**2**	**3**	**4**	**NA**
a. The instructor showed a thorough knowledge of the course material.					
b. The instructor communicated the lesson material in a way that could be easily understood.					
c. The instructor gave precise instructions concerning in-class exercises.					
d. The instructor encouraged student participation.					
e. Student's questions were answered in a professional (not demeaning to the student) manner.					
2. LESSON CONTENT: Questions related to the lesson content.	**1**	**2**	**3**	**4**	**NA**
a. The content was presented at the right pace.					
b. The student outline aided my understanding of the content covered.					
c. The environment of the class was interactive.					
3. SAFETY: Questions related to safety.	**1**	**2**	**3**	**4**	**NA**
a. Lesson related safety to job performance.					
b. Cease Training procedures were adequately explained.					
c. Safety precautions were reemphasized prior to commencing task.					
d. Safety was paramount at all times.					
e. Equipment/material was safe for use.					
4. METHODS/MEDIA: Questions related to Methods/Media.	**1**	**2**	**3**	**4**	**NA**
a. The in-class exercises required in the course were worthwhile learning experiences.					
b. The instructional method(s) used in presenting the class material enhanced my ability to learn/perform the concept/task.					
c. The media complimented instruction.					

5. STUDENT: Questions indicating student's perspective of any noted increased in his/her knowledge level. Refer to questions 5a and 5b to answer the questions below. Place number of students who indicate an increase in knowledge level in "a" and number of student indication NO increase in knowledge level in "b".

a. How many students increased their knowledge to "Average", "Above Average", or "Expert"? (For example, if a student answers 5a on IRF as "None" and answers 5b as "Average", then the student perceives an increase in his/her knowledge level).	
b. How many students indicated that there was no change in their knowledge level? (For example, if a student answers 5a as "Average" and answers 5b as "Average", then no change has occurred in knowledge level).	

AFTER INSTRUCTION REPORT

Comments (as noted by students from Instructional Rating Forms IRF):

Instructor Comments:

Reassessment of ORA:
(Comment on ORA, recommend additional safety considerations to ORA, provide lessons learned, etc.)

_____
Instructor Signature/Date

Course Chief Comments:

_____
Course Chief Signature/Date

APPENDIX G

SAMPLE RECORD OF PROCEEDINGS (ROP)

APPENDIX G consists of a sample record of proceedings (ROP). The information provided in this plan is hypothetical.

Sample ROP

1500
TRNG
Date

From: GySgt I.M. Design 123-45-6789/9917 USMC
To: Commanding Officer

Subj: RECORD OF PROCEEDINGS: *COURSE NAME*, COURSE CONTENT REVIEW BOARD (CCRB)

Ref: MCO 1553.2_

Encl: (1) Any Material to substantiate the proposed change(s)

1. As per the reference, a CCRB was conducted for the The Name of Your School or Course on Date of CCRB. The members for the CCRB were:

Capt Yohoo	Company Commander	Board Inbrief
Capt Training	Task Analyst, MCCDC	TECOM SME
Msgt Chair	PLT Commander	Board Chairman
Msgt Education	MCI Representative	Board SME
GySgt Design	Curriculum Developer	Board SME
Ssgt Leader	Company Gunny	Board SME
Ssgt Man	1st MARDIV Rep	Board SME
Ssgt Benifit	2nd MARDIV Rep	Board SME
Sgt Kamp	3rd MARDIV Rep	Board SME
Sgt Hill	Instructor	Board Recorder

2. The key function of the CCRB was to formally record information and make recommendations to improve the effectiveness and efficiency of the course's Program of Instruction (POI).

3. Areas reviewed and briefed included: ***(List all topics that were discussed in your CCRB)***

a. The principal parameters guiding the board were:

(1) Topic items (contained in paragraph 3) were briefed, discussed and voted on when action to change/correct a topic item was deemed necessary.

(2) Dissenting opinions were encouraged. The board believed that there are numerous ways to execute any segment of the course. However, it was the board's responsibility to identify and recommend the best solutions possible.

4. Areas if discussion.

a. **Topic:** Master Training Schedule

Discussion:

Recommendations:

b. **Topic:** Rewriting Individual Training Standards (ITS):

Discussion:

Recommendation:

c. **Topic:** Implementation of the AN.VIC-3(V) Intercommunication Set.

Discussion:

Recommendation:

d. **Topic:** Standardizing AFVID

Discussion:

Recommendation:

5. Again, all recommendation were voted on by every member of the board. For any questions or concerns POC GySgt Design at DSN 999-8888 or Comm at (345)432-9879.

I.M. Design

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APPENDIX H

SAMPLE EVALUATION PLAN

APPENDIX H consists of a sample evaluation plan. The information provided in this plan is hypothetical. Any similarity to a military occupation specialty (MOS) or formal school is coincidental.

SAMPLE EVALUATION PLAN

GRADUATE JOB PERFORMANCE

1. Purpose and Data Required. The purpose of this evaluation is to determine the effectiveness of the XYZ Course in adequately preparing graduates to perform the duties of MOS XXXX. The following data will be required to determine the effectiveness of the course.

a. Individual Training Standards (ITS) for MOS XXXX.

b. On-the-job performance data for graduates of Class XX-X from graduates and graduates' supervisors.

c. Applicable technical and doctrinal references.

2. Sources of Data

a. XYZ course materials [lesson plans, student materials, supplemental student materials, media, tests, Program of Instruction (POI), Record of Proceedings (ROP)]

b. Graduates of Class XX-X (30 students).

c. Supervisors of graduates from Class XX-X.

3. Schedule

a. Class XX-X will graduate on 30 July 2001. To ensure valid data can be collected, the evaluation is scheduled for 30 August allowing graduates to have been on the job at least 30 days. The principal evaluator has determined that it will require 30 days to complete an evaluation of the XYZ Course. The evaluation is scheduled to be completed 1 October 2001. However, any unforeseen delays or changes to the schedule will affect the completion date.

b. One principal evaluator and one part-time evaluator will be required to properly collect, analyze, and interpret data and report the results. The time and resources required are based on the following evaluation activities.

(1) Collect and review course materials in preparation for survey design - 1 day

(2) Design and validate survey questionnaires - 4 days

(3) Conduct survey (mail/email questionnaires; receive/monitor responses; follow-up) - 20 days

(4) Train part-time evaluator in data analysis and interpretation - 1 day

(5) Data analysis and interpretation - 3 days

(6) Prepare report of findings and recommendations - 1 day

4. Data Collection Methods

a. XYZ Course materials will be reviewed to gather data to develop relevant survey questions.

b. Survey questionnaires will be used to collect graduate job performance data. The survey questionnaires will be designed using a Likert rating scale to allow quantification and analysis of the

data. A small number of questionnaire items will be designed for open-ended responses to solicit recommendations and other comments. The survey will be validated using SME's assigned to the school.

c. Because of time and resource constraints, this evaluation will be conducted by personnel assigned to the XYZ school. One evaluator will be assigned as the principal evaluator during data analysis and interpretation. The part-time evaluator will be trained to format and code data to assist in performing the data analysis. A copy of the survey questionnaire containing hypothetical data will be used as a training aid.

5. Method for Data Analysis and Interpretation. The following analyses will be conducted using data from the returned questionnaires.

a. For all responses concerning how well the course prepared students for subsequent job duties:

(1) Descriptive statistics for graduate and supervisor responses.

(2) Comparison between graduate and supervisor ratings of course effectiveness.

b. Descriptive statistics for graduate and supervisor responses concerning the importance of each ITS task trained and how well each ITS task was trained.

c. The qualitative data collected by open-ended responses will be categorized and analyzed to identify trends that may affect the structure of the course.

d. The results of these analyses will be interpreted to determine the extent to which training prepared graduates to perform the duties of MOS XXXX and the importance of each task trained.

6. Method for Reporting. A preliminary report of evaluation results will be presented and reviewed at the CCRB, scheduled for 20 October 2001. Based on this meeting, an ROP will be prepared documenting evaluation results and any recommended revisions to the course.

APPENDIX I

SAMPLING TABLE

APPENDIX I is comprised of a sampling table that can be used to determine how many questionnaires need to be sent out to approximate the desired return rate.

SAMPLING TABLE

Population	95% Confidence	90% Confidence	80% Confidence
10	10	10	9
20	19	19	18
40	36	35	32
60	52	49	44
80	67	62	54
100	80	73	62
120	92	83	69
160	114	101	81
200	133	115	90
250	154	130	99
300	171	142	106
350	187	153	112
400	200	161	116
450	212	169	120
500	222	176	123
600	240	186	129
700	255	195	133
800	267	202	136
900	277	208	139
1,000	286	213	141
1,500	316	229	148
2,000	333	238	151
2,500	345	244	154
3,000	353	248	155
3,500	358	251	157
4,000	364	253	157
4,500	367	255	158
5,000	370	257	159
10,000	383	263	161
25,000	394	268	163
100,000	398	270	164

HOW TO USE THIS TABLE

Example: For a population of 4,200 course graduates, an estimated (desired) return rate of 85%, and a confidence level of 95%, sample size would be determined using the following procedure:

1. Locate the number corresponding to the population size. Since 4,200 is not provided in the table, round the number up or down to the nearest value. For example, the population value of 4,200 would be rounded down to 4,000.

2. Locate the value corresponding to the 95% confidence level with a population size of 4,000. Using the table above, this value is 364 (meaning that 364 questionnaires are required). This figure should be 85% of the questionnaires mailed out.

3. To determine the number of questionnaires that need to be mailed out to obtain 364 usable questionnaires, substitute the values in the formula provided below. Using our example, for a population of 4,200 and an expected return rate of 85%, the desired sample size would be 364. Therefore, in order to obtain an 85% response rate (364 responses), 428 questionnaires need to be mailed out.

The table can be used as shown in the following example:

For a population of 4,000, 95% confidence level desired, and estimated return (response) rate of 85%:

$$\frac{364 \times 100}{85} = 428$$

AIMMS - Administration Instruction Manpower Management System

AIR - After Instruction Report

AFTMS - Air Force Training Management System

AOWP - Automated Orders Writing Process

ATRRS - Army Training Requirements and Reserve System

BNA - By Name Assignment

BTR - Basic Training Record

CBT - Computer Based Training

CCRB - Course Content Review Board

CDD - Course Descriptive Data

CDI - Compact Disc Interactive

CID - Course Identifier

CMC - Computer Mediated Conferencing

CT – Cease Training

CTC – Cease Training Criteria

DOD - Department of Defense

DODIC - Department of Defense Identification Code

DVC - Desktop Video Conferencing

EDCOM – Education Command

ECC - End of Course Critique

ELO - Enabling Learning Objective

ERF - Examination Rating Form

FEA - Front-End Analysis

FMF - Fleet Marine Force

GAR - Grade Adjusted Recapitulation

ICM - Interactive Courseware Multimedia

IRF - Instructional Rating Form

ISD - Instructional System Development

IT - Interactive Televisions

ITRR - Institutional Training Readiness Report

ISC - Information Systems Coordinator

ITS - Individual Training Standard

IVD - Interactive Video Disc

KSA - Knowledge, Skills, and Attitudes

LAW - Learning Analysis Worksheet

LOW - Learning Objective Worksheet

MCAIMS - Marine Corps Automated Instructional Management System

MCCDC - Marine Corps Combat Development Command

MCTFS - Marine Corps Total Forces System

MILMOD/OTA - Air Force Military Modernization Program/Oracle Training Administration

MLF - Master Lesson File

MMTR - Military Manpower Training Report

MOS - Military Occupation Specialty

MPP - Manpower Plans and Policies

MPS - Mission Performance Standard

NITRAS - Navy Integrated Training Administrative System

ORM – Operational Risk Management

PAT - Process Action Teams

POI - Program of Instruction

RAPELLA - Reserve Affairs Personnel Entry Level Assignment System

RDM - Recruit Distribution Model

ROP - Record of Proceedings

SAT - Systems Approach to Training

SMART - Sailor Marine Academic Record Transcript

SME - Subject Matter Expert

SOP - Standing Operating Procedures

SSC - Service School Code

TRNGCOM – Training Command

TECOM – Training and Education Command

TIMS - Training Information Management System

TIP - Training Input Plan

TLO - Terminal Learning Objective

TPD - Target Population Description

TQM - Training Quota Memorandum

T&R - Training and Readiness

TRRMS - Training Requirement Resource Management System

UD/MIPS - Unit Diary/Marine Integrated Personnel System

VC - Virtual Conferencing

VR - Virtual Reality

VTC - Video Teleconference

VTT - Video Teletraining

Academic Time. Academic time includes curriculum hours dedicated to lecture, practical application, performance examination, written examination, remedial instruction, review, and tutoring within the Program of Instruction (POI).

Actual Item/Object. Equipment or devices that are actually utilized in the performance of the task or job.

Administrative Time. Administrative time consists of curricula hours committed to in and out processing times, commanding officer's time, graduation, physical training (when it does not have TLO's or ELO's associated with it and does not affect the student's GPA), inspections, and field days in a Program of Instruction (POI).

Affective Domain. A taxonomy for classifying objectives that deals with feelings, attitudes, values, and other indicators of emotionally-based behavior.

After Instruction Report (AIR). An evaluation tool that summarizes one-iteration of a lesson by documenting the student's assessment of a lesson, the instructor's assessment of a lesson (Instructional Rating Form) and exam (Examination Rating Form), test results related to the instruction, and any end of course critique data related to the specific lesson.

Aiding Conditions. Any information or resource that is available to the student and identified in the learning objective.

Analysis. Level of cognitive domain (Bloom, 1956) in which students are able to break down complex organizational structures into their component parts.

Analyze Phase. Initial phase of the Systems Approach to Training (SAT) process. The purpose of the analyze phase is to determine what the job holder must know or do on the job.

Andragogy. Literally means the art and science of teaching adults.

Application. Level of cognitive domain (Bloom, 1956) in which students are able to use learned material in new and concrete situations.

Attitudes. An acquired mental state that influences choices for personal action, such as preferences, avoidance, or commitment.

Audiotapes. Magnetic media that presents and uses audio to strengthen the learning of languages or other materials that require verbal repetition.

Auditory. Learners who tend to learn better by hearing.

Background Knowledge. The knowledge a student already knows prior to the start of instruction. Research suggests that, outside of socio-economic factors, the best predictor of student learning is what the student's background knowledge is. Transference of knowledge from one domain to another is likely to be more successful if connections can be made between what we want the student to know and what the student already knows.

Basic Fundamental Movement. Level of psychomotor domain (Simpson, Harrow, & Simpson) in which students can perform inherent movement patterns by combining reflex movements which are the basis for complex skilled movements.

Behavior. Any activity, overt or covert, capable of being measured. Also, any activity the student is expected to exhibit after instruction and the primary component of a learning objective.

Body. Major section of a lesson in which learning is developed through support material and various teaching exercises to achieve instructional objectives; preceded by an introduction and followed by a conclusion.

Break Cues. Reminds the Instructor when to provide students with a break.

Briefing. A *briefing* is a formal or informal presentation in which a variety of significant facts is presented as concisely as possible. The briefing is rarely concerned with material beyond the knowledge level and is almost always accompanied by visual representation of the material in the form of charts, graphs, slides, and other aids. Strictly speaking, the briefing is not a teaching method, but it is sometimes used in school situations.

Case Study. The case study is a learning experience in which students encounter a real-life situation in order to achieve some educational objective. By studying realistic cases in the classroom, students develop new insights into the solution of specific on-the-job problems and also acquire knowledge of the latest concepts and principles used in problem solving.

Cease Training (CT). An agreed upon verbal and/or non-verbal signal used to temporarily cease all training when, in the opinion of the signaler, a serious hazard exists or an individual is experiencing serious problems.

Cease Training Criteria (CTC). Conditions or hazards, when present, require Cease Training (CT).

Central Tendency. A single number that best represents a distribution of a set of numbers. The three most common measures of central tendency are the mode, median, mean.

Characterization. Highest level of affective domain (Krathwohl, 1956) in which students integrate values or value systems into their own life style or philosophy of life.

Checklists. Checklist consists of carefully worded questions that the evaluator answers by his review of course materials or observation of course components (e.g., graduate or instructor performance, conduct of a class).

Clarifying Questions. Follow-up questions to confirm a respondent's answer or to clarify what the respondent has said.

Closed-ended Question. A question that limits respondents' answers to predetermined response categories. Multiple choice and yes/no questions are examples of closed-ended questions.

Closure. The final segment of a lesson during which instruction is appropriately ended by reemphasizing how the lesson presented will be meaningful to the student.

Coaching. An intensive learning experience for individual or for small groups, characterized by significant student involvement and immediate instructor feedback. A videotape of student performance is an excellent teaching aid when supplemented by an instructor's analysis and critique. This technique is particularly effective in instructor training.

Coding. Coding data is the process of organizing data into sets of categories to capture the meaning or main themes in the data. Coding is usually done in the analysis of qualitative data, but quantitative data can also be grouped into code categories.

Cognitive Domain. A taxonomy for classifying objectives that deal with verbal knowledge and intellectual skills such as concept learning and procedural skills.

Collaborative Learning or Cooperative Learning. An instructoional approach in which students of varying abilities and interests work together in small groups to solve a problem, complete a project, or achieve a common goal.

Collective Training Standard (CTS). Measures of mission performance used to determine whether units can or cannot perform an assigned task. Collective training standards equate to Mission Performance Standards (MPS) contained in the MCCRES and consist of the minimum three components: task, condition, and standard.

Compact Disc Interactive (CDI). It is an interactive multimedia system combining moving and still video, audio and program content on a compact disc, which can be played back in a dedicated CD-player. It operates on its own and it can be connected to a standard TV-set for displaying pictures and sound, and optionally to a stereo-system.

Comprehension. Level of cognitive domain (Bloom, 1956) in which students begin to develop understanding and are able to translate, interpret, and extrapolate subject matter under study.

Computer-Assisted Instruction. The use of computers to aid in the delivery of instruction. A variety of interactive instructional modes are used including tutorial, drill and practice, gaming, simulation, or combinations.

Computer-Based Training (CBT). An instructional methodology where students interact individually, presented through a variety of media, controlled and monitored by a computer.

Computer Mediated Conferencing (CMC). Conferencing using the personal computer and telephone line as the communication vehicles. It provides Instruction-Student and Student-Student interaction in both an asynchronous and synchronous mode.

Concept. A class of people, objects, events, ideas, or actions which are grouped together on the basis of shared critical attributes or characteristics, and are called the same name.

Concept Card. Provides formal schools/training units with a snapshot of individual lessons.

Concurrent Validity. The validity between a new exam and a previously recognized exam already accepted as valid.

Condition. That portion of the learning objective that describes the situation/environment in which the students perform the specified behavior. Conditions include any pertinent influence upon task performance, including any or all of the following: location of performance, environment, equipment, manuals, or supervision required.

Cone of Learning. The Cone of Learning shows the progression from reading to doing and how it correlates to what is remembered over time.

Conflicting Relationships. Conflicting relationships exist between learning objectives that involve opposite responses to the same cue in a different context.

Consistency. Describes the results of a reliable evaluation instrument which remain similar given similar testing conditions (similar students, knowledge base, physical testing situation, etc.) over a period of several uses.

Construct. Exists only in the mind. Examples are love and hate.

Content Validity. A test with high content validity measures the material being covered in the curriculum or unit being tested as defined in our objective(s). In other words the test questions should refer to the subject matter covered.

Course Content Review Board (CCRB). A formal review of course materials to determine the validity of course topics and make recommendations for changes, revisions, or deletions of the content a course to MCCDC (C 461).

Course Descriptive Data (CDD). A report, which documents course description, resource requirements, and justification for the development or refinement of formal programs of instruction (POI), taught at Marine Corps training and education institutions.

Courseware. Paper-based, audiovisual, and electronically stored instructional material necessary to deliver a lesson, instructional module, or course.

Creativity. The imaginative recombination of known elements into something new and useful.

Criterion-Related Validity. Any test of carefully written measurable objectives to obtain data to compare student performance levels with that specified in the objectives.

Criterion-Referenced Assessment. An assessment that measures what a student understands, knows, or can accomplish in relation to specific performance objectives. It is used to identify a student's specific strengths and weaknesses in relation to skills defined as the goals of the instruction but it does not compare students to other students. (Compare to norm-referenced assessment.)

Cues. Markings that are graphically place in the body of the lesson to assist the instructor in the presentation of instruction

Curriculum. All instruction conducted within a school, outlined into specific topics, along with detailed learning objectives, to include behavior, conditions, and standards.

Curriculum Validation Team. A method of validation in which an experienced jobholder, novice, supervisor, instructor, and instructional designer meet to review the instructional material.

Delivery System. The instructional method and media used to present the instruction.

Demonstration. A teaching method in which students observe and then practice a sequence of events designed to teach a procedure, a technique, or an operation. It combines oral explanation with the operation or handling of systems, equipment, or materials.

Dependent Relationships. Dependent relationships exist between learning objectives that are prerequisite to other learning objectives.

Design Phase. The second phase of the Systems Approach to Training (SAT) process, which defines the course learning objectives, test, and delivery system, and from which instruction is developed.

Diagnostic Test. The purpose of a diagnostic test is to measure the achievement of the supporting skills and knowledge that contribute to the ability to perform the criterion objective.

Dialogue. Interaction between two or more persons, one of whom may be the instructor, generally to present sharply opposing points of view for students. The dialogue is often highly structured towards preplanned goals and may take the form of questions and answers between the participants.

Dichotomous Variable. A variable with only two possible responses.

Differentiation. A characteristic of evaluation which requires that tests and rating instruments be capable of making distinctions between selected groups; usually masters or non-masters of specific instructional objectives in criterion-referenced testing or high and low overall test performers in norm-referenced testing.

Directed Discussion. Involves initiating discussion and channeling students' thinking and responses along predetermined lines.

Direct Question. A question directed at an individual or group with a specific answer.

Discussion Non-Directed Method. A group interactive process in which task or objective-related information and experiences are evoked from the student. The instructor normally plays a very limited or passive role.

Distracters. Incorrect alternative responses to questions. Distracters should be worded so they are believable, but clear enough so the student is never presented with a choice between several correct answers.

Distributed Practice Session. Based on time constraints of the course, the instructional developer divides practice periods into segments. This permits more efficient learning of the psychomotor skills.

Domains of Learning. A broad classification of learning types. The three widely accepted domains that are used in this manual are the cognitive (thinking, understanding), affective (attitudes, values), and psychomotor (physical skills).

Dress Rehearsals. A process in which an instructor delivers a lesson plan in its entirety to a group prior to the actual class.

Duty. A duty (primary skill) consists of one or more tasks performed in one functional area. A duty is the major subdivision of the work performed by one individual. It is recognized as being one of the position incumbent's principal responsibilities. A set of operationally related tasks within a given job.

Enabling Learning Objective (ELO). A subordinate learning objective which describes the behavior for prerequisite knowledge and skills necessary for a student to perform a TLO or steps of the ITS.

End of Course Critique. Evaluation instrument completed by the student after a course so that the student can assess the overall course.

Environment. The physical conditions and surroundings in which a job is performed, or in which learning takes place, including tools, equipment, and job aids.

Environment Checklist. Evaluation instrument used to assess physical conditions and training conditions.

Environmental Conditions. A Physical or social condition, in which the behavior of a learning objective must be performed.

Evaluate Phase. The fifth phase of the SAT process during which the formal school/detachment determines value, worth, or merit of the instructional program.

Examination Rating Form (ERF). A reaction form completed by students upon completion of examination.

External Evaluator. In either formative or summative evaluations, external evaluators, individuals not responsible for the instructional program, conduct the evaluations. External evaluators normally include Mobile Training Teams (MTTs) from higher headquarters, site visit teams from other schools.

Extrapolation. A type of learning at the comprehension level (Bloom, 1956) in which students develop sufficient understanding to estimate trends or predict outcomes regarding the subject matter under study.

Field Trips. A field trip is an out-of-classroom experience where students interact with persons, locations, and materials or equipment for the attainment of instructional objectives. An important aspect of the field trip is the student's encounter with real settings.

Formal Lecture. A structured and often rehearsed teaching lecture with no verbal participation by students.

Formal Training. Training (including specialized training) in an officially designated course conducted or administered in accordance with appropriate course outline and training objectives.

Formative Evaluation. Form of evaluation designed to collect data and information that is used to improve the activities and products of the ISD/SAT process while the system is still being developed.

Free Discussion. Akin to the “bull session” or the “war story” hour, free discussion can be a valuable adjunct to participatory management or brainstorming but, by its very nature, it seldom supports measurable objectives.

Front-End Analysis (FEA). A systematic process in which: (1) A job is analyzed to determine its component tasks and the knowledge and skills necessary to perform these tasks; (2) tasks are selected from training based on the determination of which knowledge and skills are not already in the students' repertoire; and (3) job related performance criteria are developed to measure trainees' ability to satisfy job requirements.

Gain Attention. An approach that stimulates student curiosity and describes the benefits students will obtain by paying attention to the instruction.

Guest Lecture. A *guest lecture* is a presentation by a person other than the instructor who is usually an expert. It is used to give variety to the class period or to supply information in an area where the instructor is not an expert.

Guided Discussion. An instructional method in which the students participate in an instructor-controlled, interactive process of sharing information and experiences related to the achievement of one or more learning objectives.

Hazard. A condition with the potential to cause personal injury or death, property damage or mission degradation.

Hierarchy. The characteristic of a domain of learning that rank orders the levels-of-learning of which it is composed. See *Taxonomy of Educational Objectives and Domain of Learning.*

Higher Levels of Learning. Those levels of learning above the comprehension level (Bloom, 1956) which may be considered as the practical application of concepts and principles to complex, real problems.

High Risk Training. Basic or advanced individual or collective training, essential for preparing Marines and units for combat, that exposes students and instructors to the risk of death or permanent disability despite the presence and adherence to proper safety controls.

Implement Phase. The fourth phase of the SAT process during which instruction is delivered to the students.

Independent Relationships. Skills and knowledge in one learning objective are unrelated to those skills and knowledge in another learning objective.

Indirect Discourse. Indirect discourse involves verbal interaction among two or more persons, which is seen and heard by students. Some examples include: dialogue, teaching interview, panel, skits, playlets, and other dramatizations.

Individual Rehearsals. A process in which an instructor practices a lesson plan without any assistance from other instructors.

Individual Training Standard (ITS). The standards used to specify individual training proficiency requirements (tasks) that support unit mission performance. They include a task (behavior), condition, proficiency standards (often steps), and references. ITSs are generally derived from collective training standards. ITSs constitute the basis for design, development, implementation, and evaluation of all individual training conducted in units and institutions.

Informal Lecture. A conversational teaching lecture with considerable verbal interaction between instructor and students employing questions and discussion.

Instruction. The delivery of information to enable learning. The process by which knowledge and skills are transferred to students. Instruction applies to both training and education.

Instructional Aids. Materials used to teach where ownership belongs to the instructor. The students do not get to take the materials with them.

Instructional Design. An area of theory and practice that forms a knowledge base in the field of instructional technology. Processes for specifying conditions for learning.

Instructional Environment. Instructional environment refers to the instructional setting, media/equipment, support personnel, student materials, and the administrative functions the instructor must perform.

Instructional Material. All items of material prepared, procured, and used in a course or programs as part of the teaching or general learning process.

Instructional Method. The means used to present information to the student.

Instructional Rating Form (IRF). A reaction form (questionnaire) submitted to students following completion of a period of instruction that provides feedback on instructor performance, course materials, and instructional environment.

Instructional Setting. The location and physical characteristics of the area in which instruction takes place.

Instructional System Development (ISD). Identical to definition for "systems approach to training."

Instructor. The individual, military and/or civilian, assigned the responsibility of providing instruction.

Instructor Notes. Includes any information pertinent to the conduct of the lesson and can appear throughout the lesson plan.

Instructor Preparation Guide. A checklist that includes essential data, the instructor can quickly look at when preparing the lesson to get an idea of lesson content, duration, method, location, instructors required, references, and necessary instructional aids/equipment.

Interactive Courseware Multimedia (ICM). A set of commercially produced, computer-based, multimedia instructional modules, which comprise a full credit-bearing course. This courseware contains text, computer graphics, photographic stills, animation, sound and motion video. It offers highly interactive learning functionality for the learner, and contains instructional support and student support systems. The courseware is integrated into the delivery of courseware by the faculty. It is not intended for use as a "bolt on" attachment to a traditional lecture based course.

Interactive Multimedia Instruction (IMI). A group of predominantly interactive, electronically delivered training and education support products. IMI products include instructional software and software management tools used in support of instructional programs.

Interactive Television. Literally it combines traditional TV watching with the interactivity of the Internet and personal computer. Programming can include richer graphics, links to Web sites through TV Crossover Links, electronic mail, and chatroom activity and online commerce through a back channel (T-commerce).

Interactive Video Disc (IVD). Computer-controlled laser disc player used to present segments of video in a course or lesson.

Internal Evaluator. In either formative or summative evaluations, individuals working within the organization responsible for the instructional program, conduct the evaluation.

Interpretation. A type of learning at the comprehension level (Bloom, 1956) in which students develop and understand relationships among the various aspects of a communication and are able to perform such activities as making inferences, generalizing, and summarizing.

Interval Scale. Consists of mutually exclusive, exhaustive categories arranged in a hierarchical order. The intervals between numbers that represent categories are equal, but there is no true zero on the scale.

Interview. A set of structured questions used to gather information from respondents. Conducted in person or over the telephone.

Item Analysis. A set of methods used to evaluate the effectiveness of test items.

Item Difficulty. The number of people who get a particular test item correct, generally expressed in a percentage.

Item Discrimination. A comparison between people who have done well on a test and people who have not done well.

Introduction. Major section of a lesson designed to establish a common ground between the instructor and students, to capture and hold attention, to outline the lesson and relate it to the overall course, to point out benefits to the students, and to lead the students into the body of the lesson; usually contains gain attention, motivation, and overview steps.

Job. The duties, tasks, and task elements performed by one individual that constitutes his/her job. The job is the basic unit used in carrying out the personnel actions of selection, training, classification, and assignment.

Job Aid. Any item developed or procured for the purpose of assisting in the conduct of instruction and the process of learning. Examples of job aids include checklists, procedural guides, worksheets, etc.

Job Performance Measure. An instrument used to evaluate proficiency of a job holder on each task performed.

Job Task Analysis. A process of examining a specific job to identify all the duties and tasks that are performed by the job incumbent at a given skill level.

Kinesthetic. The ability to learn by through the use of motion, movement, or the performance of the required activity. Related to task requirements, one of the criteria for selection of delivery systems.

Kinesthetic Learner. Learners who tend to learn better by doing.

Knowledge. Information required to develop the skills for effective accomplishment of the jobs, duties, and tasks.

Knowledge-Based Tests. A knowledge-based test measures cognitive skills.

Knowledge level. The lowest level of the cognitive domain (Bloom, 1956) in which students have the ability to recall or recognize material in essentially the same form as it was taught.

Learning. A change in a person's behavior as a result of stimulus or experience. The behavior can be physical and overt, or it can be intellectual or attitudinal.

Learning Analysis. A procedure to identify a task's related knowledge and skills that must be learned before a student can achieve mastery of the task itself.

Learning Analysis Worksheet (LAW). Worksheet used during the learning analysis to generate knowledge and skills related to the task and its performance step(s).

Learning Objective. A statement of the behavior or performance expected of a student as a result of a learning experience, expressed in terms of the behavior, the conditions under which it is to be exhibited, and the standards to which it will be performed or demonstrated.

Learning Objective Worksheet (LOW). Worksheet used to generate learning objectives, test items, and the delivery system to be used.

Learning Style. An individual's preferred ways of gathering, interpreting, organizing, and thinking about information.

Lesson Plan. An approved plan for instruction that provides specific definition and direction to the instructor on learning objectives, equipment, instructional media material requirements, and conduct of the training. Lesson plans are the principal component of curriculum materials in that they sequence the presentation of learning experiences and program the use of supporting instructional material.

Lecture. A formal or informal presentation of information, concepts, or principles by a single individual.

Likert Rating Scale. A rating system that allows data to be evaluated on a quantitative scale.

Limiting Conditions. Any information or resource that is not available to the student and identified in the learning objective.

Main Points. The primary, logical break out of subject matter to support an instructional objective.

Managed On-The-Job Training (MOJT). Training conducted in the unit environment which utilizes a combination of classroom instruction and practical application. The classroom instructor is also the work supervisor of the trainee. Evaluation of the students is based upon the capability to demonstrate specific training standards.

Management-Oriented Evaluation. Approach to evaluation that entails collecting information to aid management decision-making as an instructional program operates, grows or changes.

Massed Practice Session. The instructional developer plans one continuous practice session due to time constraints of the course,.

Master Lesson File (MLF). A compilation of documents that contain all the materials necessary to conduct a period of instruction or lesson.

Mastery. The achievement of the prescribed learning objective.

Mastery Learning. Criterion-referenced testing is the preferred method of testing for learning objectives taught in the formal school/training center. The criteria for test mastery are established by the learning objectives. The student, when completing a test, receives either a master (pass) or non-master (fail) for each learning objective. The student may be assigned an overall score, but it does not remove the responsibility of mastering each learning objective. Students that non-master a learning objective will receive remedial instruction and retesting until they reach the standard for mastery.

Measurement. The act of acquiring data in the educational environment without making value judgments regarding the relative or absolute merits of those data.

Measurement Error. The extent to which a score has been influenced by irrelevant or chance factors such as fatigue, practice, time between the instruction and the administration of the instrument, etc. Also, every test contains errors of

measurement. No one test accurately measures a student's achievement or ability. Carefully designed standardized tests may have measurement errors of 5-10 percent. Teacher-designed tests have large measurement errors. A test result shows that a student falls into a range of scores and not just a single reported score. Focusing on a single score and ignoring the score range is among the most serious of score reporting errors.

Media. Means of presenting instructional materials to the learner; for example, filmstrips, videotapes, slides, wall charts, etc.

Media Cues. Used to remind instructors what media to use and when to present it during the lesson plan.

Median. The score above and below which 50 percent of the scores in the sample fall. Median is sometimes referred to as the "breaking score".

Mean. Arithmetic average of all scores.

Mediated Instruction. Includes such devices as slides, films, tapes, and cassettes used to present the planned course of instruction to the learner.

Mental Skill. Cognitive ability involving the processing, synthesis, and analysis of information.

Military Occupational Specialty (MOS). A four-digit code that describes a group of related duties and job performance tasks that extend over one or more grades. It is used to identify skill requirements of billets in T/Os, to assign Marines with capabilities appropriate to required billets, and to manage the force. It is awarded when performance-based criteria have been met as set forth in ITS/T&R Orders.

Mission Performance Standards (MPS). Criteria that specify mission and functional area unit proficiency standards for combat, combat support, and combat service support units. They include tasks, conditions, standards, evaluator instructions, and key indicators.

Mode. The most frequently occurring score.

Models & Mock-ups. A model is a copy of a real object. It can be an enlargement, a reduction, or the same size as the original. The scale model represents an exact reproduction of the original, while simplified models do not represent reality in all details. Some models are solid and show only the outline of the object they portray, while others can be manipulated or operated. Still others, called mock-ups, are built in sections and can be taken apart to reveal the internal structure. Whenever possible, the various parts should be labeled or colored to clarify relationships.

Modular Instruction. A prepackaged unit of instruction which typically contain a clear statement of objectives and all necessary learning resources to permit the learner to achieve these objectives. A module can be a complete unit or part of a course.

Motivation. Motivation interests the learner and focuses their attention on the lesson. The motivation for a lesson may be intrinsic or extrinsic. Intrinsic motivation refers to topics that students like or enjoy. Extrinsic motivation focuses on external rewards for good work or goal attainment.

Nominal Scale. Consists of descriptive categories. The number represents different categories in the set but has no mathematical meaning.

Non-Discursive Communication. Level of psychomotor domain (Simpson, Harrow, & Simpson) in which students communicate through bodily movements ranging from facial expressions to sophisticated choreographics; going from one movement to another in a specified order.

Norm-Referenced Assessment. An assessment designed to discover how an individual student's test scores are compared to scores on the test taken by a group of individuals who represent the target audience. Prevalent to aptitude and achievement tests that relate scores to a percentile. (Compare to criterion-referenced assessment.)

Objectives-Oriented Evaluation. Approach to evaluation that determines the extent to which learning objectives have been achieved (see criterion-referenced testing).

Objectivity. A characteristic of evaluation which requires that measurement in an educational environment be correct and factual and be free from instructor bias.

Observation. A form of evaluation conducted during practical applications, performance test, or on the job, where evaluators, instructors, or supervisors can observe the students' performance.

Observation Checklist. Evaluation instrument used to provide quality control and review effectiveness of instruction through the review of the Master Lesson File and the effectiveness of the lesson, activities, student materials, media, etc. as observed during a convening lesson.

Occupational Field (OCCFLD). A range of related military occupational specialties (MOS's) that share the same first two digits (e.g., 0300, 0311).

Open-Ended Question. A question that asks for narrative responses and allows respondents to respond in their own words.

Operational Risk Management (ORM). The process of dealing with risks associated with military operations. It includes risk assessment, risk decision-making, and the implementation of risk controls.

Operational Test and Evaluation. Approach to evaluation that determines whether a product represents a significant improvement or benefit over alternative products.

Ordinal Scale. Consists of categories arranged in a hierarchical order. The intervals between numbers that represent categories are not equal.

Organization. Level of affective domain (Krathwohl, 1956) in which students compare, relate, and synthesize new values into their own value systems.

Overhead Question. A question not specifically related to subject matter, but solicits a general response to the lesson.

Panel. A structured or unstructured discussion between two or more experts (generally excluding the regular instructor), presented in a variety of ways, such as constructive arguments followed by debate, response to questions from the instructor or the students, a preplanned agenda, a fixed or a random order of speakers, or free discussion.

Part Practice Session. A method of teaching that breaks down a task into parts. Used when tasks do not have highly interrelated subtask.

Pedagogy. Literally means the art and science of teaching children.

Peer Teaching. Method where instructors allow students to teach other students with the student available to clarify material presented unclearly.

Perceptual. Level of psychomotor domain (Simpson, Harrow, & Simpson) in which students interpret various stimuli (something that directly influences action) and make adjustments to the environment. Suggests cognitive as well as psychomotor behavior.

Performance. Part of a criterion objective that describes the observable student behavior (or the product of that behavior) against an established standard of performance as proof that learning has occurred.

Performance Checklist. The breakdown of a task into elements that must be correctly performed to determine whether each student satisfactorily meets the performance standards described in the objective....

Performance Measure. The absolute standard by which job performance is judged. It includes behaviors, results, and characteristics that can be observed and scored to determine if a student has performed a task correctly.

Performance-Based Test. Sample work situation that measures how well the student has mastered the psychomotor (physical) and cognitive (mental) skills required for task or job performance.

Physical Activities. Level of psychomotor domain (Simpson, Harrow, & Simpson) in which students perform activity requiring endurance, strength, vigor, and agility.

Physical Skill. Directly observable behavior requiring the movement of body muscles. Also referred to as psychomotor skill.

Pilot Course. A validation method used where instructional materials in final form are presented to a target population group.

Population. A well-defined group of subjects, things, or characteristics from which measurements are taken (for example, all students 6 feet or taller represents a specific population).

Post-Graduate Survey. Evaluation instrument to collect data from the graduates regarding a course previously attended.

Posttest. A test administered after the completion of instruction to assess whether a student has mastered the objectives of the class, lesson, course or other unit of instruction (see summative evaluation).

Practical Application. A technique used during an instructional session which permits students to acquire and practice the mental and physical skills necessary to perform successfully one or more learning objectives.

Practice and Provide-Help Cues. Practice cues describe the student's role in the practical application portions of a lesson, while provide-help cues describe the instructor's role.

Predictive Validity. We can establish predictive validity for our Correct Response to Test (CRT) in much the same fashion as we can determine concurrent validity. When we have two CRT measurements of what we believe to be the same skill or knowledge taken at a considerable length of time from each other, we may wish to determine how well the first CRT predicted success on the second CRT. We may wish to see how our school posttest predicts success on the job as measured by supervisor ratings. Or we may wish to determine how well a pencil-and-paper test can be used to predict future success on a performance exam. In these and similar situations, we can use various statistics to establish predictive validity between two CRT's as long as they are both scored on a pass or fail basis and the tests are separated by a substantial period of time.

Prerequisite. A requirement the student must possess before being able to receive instruction. It covers what a student must know before taking a lesson of instruction.
Pretest. A test administered prior to instruction to determine how much the student already knows (see formative evaluation).

Primacy. Material presented earlier or first.

Printed Materials. A form of visual information media that includes flat pictures, charts, diagrams, and graphs.

Probe. An unplanned instructor-initiated question used to seek clarification, probe for understanding, or to control the direction of the discussion; may be either direct or overhead question.

Process Method. Method used by evaluators to describe and document the actual development process of a specific course by use of a checklist.

Process Testing. Testing where the procedure or steps (tasks) used to get to the end result are used to evaluate the student.

Product Testing. Testing where the characteristics of a good product are used to evaluate the student.

Program of Instruction (POI). A training management document that describes a formal course in terms of structure, delivery systems, length, intended learning outcomes, and evaluation procedures.

Programmed Instruction. A method of instruction that usually includes a carefully planned sequence of small units of instruction which require the learner to respond to cues and receive immediate feedback. Various media (books, teaching machines, and computers) are used to deliver the programmed instruction to the learner.

Progress Method. Method used by evaluators to provide an audit trail that keeps management informed of the progress of the course development effort.

Progress Test. Tests administered throughout a course to evaluate student progress and to determine the degree to which students are accomplishing the learning objectives (see formative evaluation).

Projected Still Images. A form of visual information media that includes overhead transparencies and slides.

Psychomotor Domain. A major area of learning which deals with acquiring the ability to perform discrete physical skills requiring dexterity, coordination, and muscular activity.

Psychomotor Skills. Motor action directly proceeding from mental activity. Also referred to as physical skill.

Qualitative data. Qualitative data are subjective in nature. They emphasize standardization, precision, and reliability of measures of efficiency when evaluating training/education outcomes.

Quantitative data. Quantitative data are objective in nature and are gathered through standard methods (measures of efficiency, participant observation, interviews, etc.).

Questioning Method. Method used to emphasize a point, stimulate thinking, keep students alert, check understanding, review material, and seek clarification.

Questionnaire. A data collection instrument consisting of a printed form containing a set of questions used together information from respondents.

Range. The difference between the largest and smallest scores occurring in a distribution.

Rating Scales. Any number of instruments upon which instructors record their assessments of student performance through a process of observation or measurement and judgment.

Ratio Scale. Consists of categories arranged in hierarchical order that has equal intervals between categories (i.e., any two adjoining values in a ratio measure are the same distance apart). A true zero anchors the scale of a ratio measure.

Reading Method. Reading is the assignment to a student of printed materials including books, periodicals, microforms, manuals and regulations, and handouts (instructor-produced).

Receiving. Lowest level of affective domain (Krathwohl, 1956) in which students become aware of and pay attention to someone or something.

Recency. Material presented not long ago.

Record of Proceedings (ROP). The evaluation results and recommendations that is the result of the Course Content Review Board.

Reflex Movements. Level of psychomotor domain (Simpson, Harrow & Simpson) in which students perform an action without learning it in response to some stimuli (something that directly influences the activity).

Reliability. An indicator of score consistency over time or across multiple evaluators. Reliable assessment is one in which the same answers receive the same score regardless of who performs the scoring or how or where the scoring takes place. The same person is likely to get approximately the same score across multiple test administrations.

Remedial Instruction. Supplemental instruction designed to correct student misunderstanding of course material or a student learning deficiency. A sequence that provides an alternative, more basic approach to meeting the same instructional objective.

Responding. A level of the affective domain (Krathwohl, 1956) in principle which students act or comply with the instructor's expectations by performing an act and obtain satisfaction from it.

Risk. An expression of possible loss in terms of severity and probability.

Risk Assessment. The process of detecting hazards and assessing associated risks.

Role-playing. Students project themselves into simulated interpersonal situations and act out the parts of the persons and situations assigned by the instructor. Role-playing is generally limited to practice of the skills involved in interpersonal relations, such as counseling, interviewing, and conference leadership.

Safety Brief. A brief provided to make students aware of the identified hazards and the controls implemented to minimize risks.

Safety Checklist. Evaluation instrument used by instructors or the administration to ensure that proper safety procedures have been adhered to.

Safety Questionnaire. Student reaction form used to provide evaluation feedback on safety within the instructional environment.

Scales of Measurement. Method of measurement that specify how numbers assigned to variables relate to the property being evaluated or measured.

Self-Paced Instruction. Instructional method which permits a student to progress through a course of instruction at the student's own rate.

Simulation. Actual or mock-up of a piece of equipment that allows duplication of job performance.

Site Visit. Visit by formal school personnel to the Fleet Marine Force to observe and interview graduates.

Skill. The ability to perform a job related activity that contributes to the effective performance of a task.

Skilled Movements. Level of psychomotor domain (Simpson, Harrow, & Simpson) in which students perform a complex task with a degree of efficiency.

Slides. A piece of 35-millimeter film on which individual slides or frames appear in sequence. Some filmstrips are accompanied by a tape or disc that contains narration and a signaling device that indicates when to advance the filmstrip to the next frame. Depending on the type of projector, the film advances either manually or automatically.

Small Critical Audience Rehearsals. A process in which an instructor delivers a lesson plan in its entirety to a small group of instructor/peers to evaluate the delivery of a lesson.

Socratic Method. A conversation or discussion wherein two or more people assist one another in finding the answers to difficult questions. The method may resemble a guided discussion, but the goal is often to obtain specific answers to specific questions and not to stimulate discussion. This method facilitates the student's quest for understanding by requiring the student to answer questions on his/her own, to ponder the validity of what others have said or written, and to give reasoned support of his/her opinion to the other students in the group.

Standard. Part of a learning objective, the standard establishes a criterion for how well the task or learning objective must be performed.

Standard Deviation. Describes the amount of variability in a group of scores.

Standing Operating Procedure (SOP). A document that outlines the policies and procedures of an organization.

Stem and Responses. Makes up multiple choice test items. The stem presents a problem, question, statement, or situation, all information needed to answer the multiple-choice question. The response is made up of several possible responses where only one response is the correct answer.

Storyboard. A script sheet that shows key visualization points with accompanying video information.

Student. The individual receiving instruction, the individual learning from the interactive courseware, or an individual who has been placed in a learning situation to acquire knowledge and skills required for accomplishment of specific tasks.

Student Data Form. Form used to collect personal data from the student upon arrival at a course.

Student Materials. Additional facts and information given to the students as a study guide that can be referred to during the course and as a job aid that students can take back to their unit following completion of the course. There are two types of student materials, student outlines and supplemental student materials.

Student Outline. Student material which provides the student with a general structure to follow during the class and a conceptual framework that highlights the main ideas of the class.

Student Query. "Students asking questions" is often used in combination with other methods such as the lecture, the panel discussion, or the teaching interview, but it could be used by itself, either on a one-to-one basis in tutoring or coaching or as part of small or large groups. The method is student controlled, although the responder can also control the session to a certain extent if skillful enough. Students' questions may often be a measure of the degree of their understanding of a particular matter, that is, they "know enough to ask the right questions."

Subject Matter Expert (SME). An individual who has a thorough knowledge of a job, duties/tasks, or a particular topic, which qualifies him to assist in the training development process (for example, consultation, review, analysis, advise, critique).

Summary. A major section of a lesson, which follows an introduction and body. It should contain a summary, closure, and administrative directions.

Summative Evaluation. Used to make judgements and determinations concerning student achievement and the effectiveness of the instructional program. Summative evaluations lead to grades, to reports about a student's relative level of competence, and to alterations of instructional programs. Also designed to collect data and information during the operational (field) tryouts of equipment/system in order to determine the effect of the instruction under operational conditions and to make any changes or revisions to the system prior to becoming operational.

Supplemental Student Materials. Any handout, other than the student outline, given to the students to support the instruction.

Supportive Relationships. Skills and knowledge in one learning objective have some relationship to those in another learning objective.

Survey Test. A survey test is designed to determine what prospective students already know and can do before receiving the instruction.

Synthesis. Level of cognitive domain (Bloom, 1956) in which students are able to put parts together to form new patterns or structures.

Systems Approach to Training (SAT). An orderly process for analyzing, designing, developing, implementing, and evaluating an instructional program which ensures personnel acquire the knowledge's and skills essential for successful job performance.

Target Population Description (TPD). The TPD provides a general description of the target population and establishes administrative, physical, and academic prerequisites that students should possess to be assigned to a formal school of instruction. The level of experience the average student will bring into the classroom must be considered. Due to their lack of experience, entry-level students may not be able to comprehend multiple objectives in a single lesson.

Task. A unit of work usually performed over a finite period of time, which has a specific beginning and ending, can be measured, and is a logical and necessary unit of performance.

Task List. The sequential, component steps in a larger task; represented by achievement of a criterion objective.

Taxonomy of Educational Objectives. A systematic classification scheme for sorting learning outcomes into three broad categories (cognitive, affective, and psychomotor) and rank ordering these outcomes in a developmental hierarchy from least complex to most complex.

Teaching Interview. The instructor questions a visiting expert and follows a highly structured plan, which leads to educational objectives. The advantage of the teaching interview over the guest lecture is that the instructor controls the expert's presentation. The expert normally requires little or no advance preparation, but responds extemporaneously from general experience. When a question-and-answer period follows the interview, students can interact with the expert.

Terminal Learning Objective (TLO). A TLO is a statement of what a student is expected to perform upon completion of a lesson, topic, major portion of a course, or course completion.

Test. Any device or technique used to measure the performance , skill level or knowledge of an individual.

Time Cues. Approximations for the amount of time required for presenting each lesson component. Each component and main idea of a lesson plan has a time cue. The sum of all the main idea time cues equal the time cue for the body.

Training. Instruction and applied exercises for the attainment and retention of skills, knowledge, and attitudes required to accomplish military tasks.

Training & Readiness (T&R) Event. An individual or collective training standard.

Transfer of Learning. The extent to which what the student learned during instruction is used on the job.

Transparencies. An overhead transparency is usually made from acetate or plastic, which has been prepared for us on an overhead projector. If hand drawn transparencies are needed, materials such as heavy-duty, clear plastic bags, document protectors, and reprocessed x-ray film can be used in place of commercially produced acetate. In addition, transparencies can be made from existing printed material by using a thermoprocess machine and special film.

Transitions. Statements used by the instructor to move from the introduction of a lesson to the body, between main points between sub points within each main point, and from the body to the conclusion of the lesson. These statements show a logical relationship between the lesson segments they connect.

Validation. The process by which the curriculum materials and instruction media materials are reviewed by the contractor for instructional accuracy and adequacy, suitability for presentation, and effectiveness in providing for trainees' accomplishment of the learning objectives. Validation is normally accomplished in tryouts with a representative target population. The materials are revised as necessary as a result of the validation process.

Validity. A characteristic of evaluation, which requires that testing instruments measure exactly what they were intended to measure. A test with high content validity measures the material covered in the curriculum or the unit being tested. A test with high criterion validity successfully predicts the ability to do other work. For example a test to be an auto mechanic with high criterion validity will successfully predict who will become a good mechanic.

Variability Attributes. Characteristics shared by some, but not all, members of a class of people, object, events, ideas, or actions which are grouped together on the basis of shared critical attributes and called by the same concept name.

Variance. The average squared deviation from the mean variance is useful for determining how far off the mean students score on a particular test item or test.

Valuing. Level of affective domain (Krathwohl, 1956) in which students accept, prefer, or commit themselves to an object or behavior because of its perceived worth or value; to appreciate.

Video Tele-Training (VTT). Supports distance learning and video teleconferencing which allows us to send and receive presentations, allows students to interact with the instructors and students at distance sites and has the capability of connecting to more than 20 classrooms/sites around the world with one instructor teaching them all. This technology also has the capability of connecting to almost any kind of broadcast format.

Virtual Conferencing. Video teleconferencing that allows instructors the ability to send and receive presentations, and allow students the opportunity to interact with instructors at distance sites.

Virtual Reality (VR). Virtual reality is the computer-generated simulation of a real or an imagined environment or world. It can be graphics-based (e.g., a walk-through of a building) or text based (e.g., a description of a city where participants can interact with one another).

Visual Learners. Learners who tend to learn better by seeing.

Whole Practice Session. A method of teaching an entire task. Used when tasks have highly interrelated subtask.

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