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Ref: (a) MCO 1553.2B
(b) NAVMC 1553.2
(c) MIL-HDBK-29612-2A, Department of Defense (DOD) Handbook, Instructional Systems Development/Systems Approach to Training and Education
(d) MCRP 3-0A
(e) MCDP 1
(f) CMC FRAGO 01/2016: Advance to Contact
(g) CJCS Memo (CM-0166-13), Officer Desired Leader Attributes for Joint Force 2020
(h) CJCS Memo (CM-0260-13), Enlisted Desired Leader Attributes for Joint Force 2020
(i) MCDP 6
(j) MCDP 1-3
(k) CJCSI 1800.01E, Officer Professional Military Education Policy (OPMEP)
(l) MCO 1200.13G
(m) MCO P3500.72A
(n) NAVMC 1200.1A
(o) MCO 1580.7D
(p) MCO 3500.27C
(q) Marine Corps Instructor Mastery Model (IMM), dtd 23 Jan 2015
(r) Making Good Instructors Great (MGIG) Handbook, dtd 11 Jan 2012

Encl: (1) MCISD/SATE HANDBOOK

1. Purpose. To establish procedures and business rules for the application of the Marine Corps Instructional Systems Design/Systems Approach To Training and Education (MCISD/SATE) process to formal school curriculum development and unit training management for the Operating Forces (OPFOR), per reference (a).

2. Cancellation. NAVMC 1553.1.

3. Background. MCISD/SATE is a set of comprehensive processes, guidelines, tools, and techniques needed to define and close the gap between current and desired job performance through instructional intervention or sustainment training. The Marine Corps originally targeted the MCISD/SATE process for initial job training in Formal Schools, but the comprehensive system also applies to Managed On-The-Job Training (MOJT) in the OPFOR and supporting establishment.

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4. Scope. This NAVMC provides guidance on the management process for Marine Corps instructional programs and is intended for all those involved in training and educating Marines, with particular emphasis on application within Marine Corps Formal Schools as defined in reference (b). To illustrate instructional program development from start to finish, the five phases of the MCISD/SATE process are presented sequentially in this handbook - Analyze, Design, Develop, Implement, and Evaluate (ADDIE). At certain points in the process, these phases procedurally overlap and are interrelated throughout the life of the instructional program. This handbook is developed in accordance with policies, directives, instructional theory, and doctrinal guidance outlined in references (b) through (r). The MCISD/SATE process is the primary source of information for instructional program development and management for Marine Corps Formal Schools and Marine specific courses of instruction collocated at other military service schools. Although the MCISD/SATE process impacts all job holders, there are specific chapters that apply to individual billets. In addition, the instructional design model presented in this handbook serves as a blueprint – though slightly modified - for organizing and structuring Unit Training Management (UTM) process in the OPFOR. Refer to reference (d) for more comprehensive guidance on applying the MCISD/SATE process to UTM.

5. Changes. The System’s Approach to Training User’s Guide has been renamed the MCISD/SATE Handbook and has been revised to include emphasis to specific areas, as well as additional chapters for clarity, information, and understanding. Chapters on Training and Education and Adult Learning have been added to this version of the handbook. Appendix D contains a comprehensive list of resources to assist Formal Schools during all phases of ADDIE. Recommendations for further improvements to this NAVMC are always encouraged from commands.

6. Information. Commanding General (CG), Training and Education Command (TECOM) will update this handbook as necessary to provide current and relevant procedures to ensure current best practices are available for use by Marine Corps Formal Schools. All questions pertaining to this handbook should be directed to: CG, TECOM, MAGTF Training & Education Standards Division (C 466), 1019 Elliot Road, Quantico, VA 22134.

7. Command. This NAVMC is applicable to the Marine Corps Total Force.

8. Certification. Reviewed and approved this date.

J. W. LUKEMAN
By direction

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MCISD/SATE HANDBOOK

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CHAPTER 1

OVERVIEW

1. Introduction. The goal of Marine Corps instruction is to develop performance-based, criterion-referenced instruction that permits students to effectively transfer knowledge and skills from the learning environment to the job. For that goal to be achieved, instruction must be both 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. The MCISD/SATE process is a dynamic, flexible, total force system for developing and implementing effective and efficient education and training to meet current and projected readiness needs for all learners. It must be flexible to accommodate a wide range of audience characteristics, mission requirements, and instructional approaches. The system must also ensure that training meets readiness demands within the constraints of available resources. The MCISD/SATE process does not provide a specific procedure for every learning situation that can be encountered. Instead, it presents a generalized approach that can be adapted to the instruction and delivered appropriately to the adult learner.

2. Doctrinal/Philosophical underpinnings

> *"There are two basic military functions: waging war and preparing for war. Any military activities that do not contribute to the conduct of a present war are justifiable only if they contribute to preparedness for a possible future one. Clearly, we cannot afford to separate conduct and preparation. They must be intimately related because failure in preparation leads to disaster on the battlefield."*
>
> *- MCDP 1, Warfighting*

a. Per reference (e), training and education attempts to ready Marines and Marine units for uncertainty on the battlefield by teaching agile thinking for a changing situation. Training discrete skills is not enough to teach Marines to function on the battlefield, but rather they must be able to adapt to the ever changing nature of war; education provides a means to cultivate that talent.

b. "Like war itself, our approach to warfighting must evolve. If we cease to refine, expand, and improve our profession, we risk being outdated, stagnant, and defeated." - General Gray, 29th Commandant of the Marine Corps (CMC). Per reference (f), General Neller (37th CMC) reemphasizes this point by opening the aperture of our doctrinal thought process by stating, "...we must continue to advance and adapt at a pace as fast as the world around us. Doing what we do better, or adapting, takes today's tools (and those arriving in the next few years) and combines them with new operating concepts and methods to produce increased competitive advantage for the MAGTF." In order to uphold the Marine Corps culture of being exceptionally proficient on the battlefield, we require all Marines regardless of Military Occupational Specialty (MOS) to be able to serve in provisional infantry roles – that is to shoot, move, communicate, and lead Marines in combat. In order to achieve these demands, it takes the combined efforts of both training and education across the Marine Corps enterprise.

3. Nature of Learning

a. The broad concept of learning and its theories are enough to fill volumes; the challenge is to capitalize on the most important principles and certainties critical to the Marine Corps. Therefore, understanding of the nature of learning must take a holistic view of the prominent perspectives on learning, adopting a blended approach that seems most useful to the Marines and the Marine Corps learning settings with the ultimate goal of producing expeditionary readiness.

b. Learning is a modification of behaviors or mental associations due to direct or indirect experience in the environment. Learning is known to take place in three broad areas or "domains." These domains are cognitive (oriented on knowledge), psychomotor (oriented on skills), and affective (oriented on attitudes). Behaviors are outwardly observable actions by a person in an environment and are related to mental associations within the domains of learning - "what learners must do". Mental associations are internal connections made in the brain as the result of experience in an environment - "what occurs in a learner's brain that can't be seen". Learned knowledge, skills, or attitudes (KSA) can atrophy without reinforcement or use. Learning is measured by objective and subjective evaluation.

c. Learning must support the needs of expeditionary readiness through short or longer term goals. Intentional learning is designed in the form of training and education. The transformation that takes civilians and turns them into Marines is indicative of the power and the criticality of learning to meet the needs of our nation and our Corps. Learning in the Marine Corps is ultimately about changing behaviors to reach intended goals driven by strategic, operational, and tactical demands.

4. Marine Attributes

a. The ultimate goal of all individual training and education is to develop, foster, and sustain the Marine attributes at every step in a Marine's career. Similar to how Mission Essential Tasks (MET) are the measurement associated to collective tasks, Marine attributes are the measurement associated to individual tasks. Per references (g) and (h), the Chairman of the Joint Chiefs of Staff (CJCS) directed a review of joint education with the primary objective to "ensure that all services are developing agile and adaptive leaders with the requisite values, strategic vision, and critical thinking skills to keep pace with the changing strategic environment." In compliance with the Joint Desired Leader Attributes, the Marine Attributes align with this directive and are defined as "the manifestation of competencies and traits required of all Marines to meet the challenges of the present and future operating environments."

b. Each of the five Marine Attributes is an integral component of the "Whole Marine." Any time an individual or group designs or assesses training and education for subordinates or oneself, the attributes should provide the overarching framework that ensures the whole Marine is being developed. The Attributes form the vocational ideals that all Marines should be striving to achieve through self-development, individual and collective training, and professional military education. Figure 1-1 illustrates the five Marine Attributes as they relate to the "Whole Marine". The Marine Attributes are: Exemplary Character, Physically/Mentally Tough, Warfighter, Decide/Act/Communicate, and Leadership.

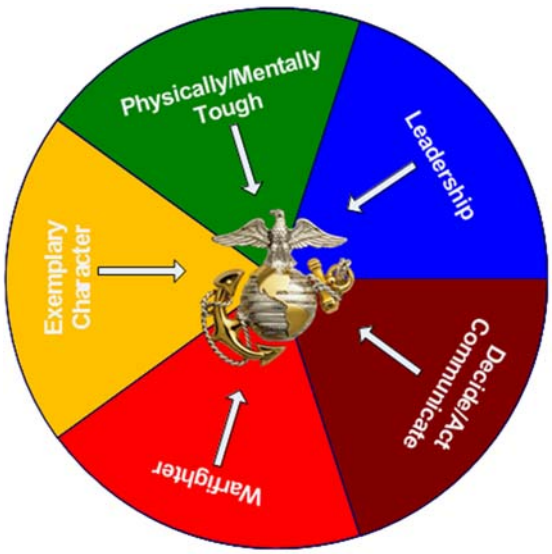

Figure 1-1.--Marine Attributes

5. Marine Competencies. Marine Competencies are a specific range of behaviors and mental associations expected of an individual Marine and are acquired through the integration of training, education and experience. They are the first step in turning the ideals of the Marine Attributes into practical training and education. They are not associated with a specific course, but rather an individual's capacity to perform a job and are categorized as being either behavioral or cognitive. Reference (r) identifies five core competencies associated to the Small Unit Decision Making (SUDM) initiative, which can be leveraged to provide a framework for identifying higher tier learning domain goals within outcomes based training and education.

a. Adaptability. Consistent willingness and ability to alter attitudes, thoughts, and behaviors to appropriately respond to actual or anticipated change in the environment.

b. Attentional control. Ability to direct and sustain attention on a deliberately chosen target, tolerate sustained attention even when unpleasant, and maintain awareness of own attention.

c. Metacognition. Thinking about your own thinking; using cognitive strategies to monitor/self-regulate learning and other mental processes.

d. Problem solving. Understanding the problem space, generating possible solutions, and applying complex strategies to achieve (or move toward achieving) a specific goal.

e. Sensemaking. Understanding connections (i.e. among people, places, and events) in order to anticipate their trajectories, estimate the overall situation, and act effectively.

6. Marine Definitions. The following are the service-level definitions for an individual Marine. These statements provide a foundation to build upon at each progression throughout the training and education continuum. Although these definitions provide focus for the Formal Schools during course design and development, they are broadly written and do not specifically address an

individual Marine's technical and tactical proficiency (e.g. MOS). For this reason, the MCISD/SATE process provides a systematic approach that illustrates how outcomes based training and education supports the Occupational System identified in the MOS Manual.

a. Basic Marine. A basic Marine is one who has embraced our core values and is transformed by our Corps' shared legacy. A basic Marine represents the epitome of personal character, selfless, and military virtue.

b. Marine Rifleman. A Marine rifleman is a physically fit, mentally hardened and offensively minded warrior, skilled in the disciplined application of force and possessing the moral courage to make sound decisions and withstand the rigors of combat.

c. Marine Leader. A Marine leader is a physically fit, tactically and technically proficient warrior of high moral character with a bias for action possessing the courage to make ethically sound decisions and capable of properly preparing and leading Marines to successfully accomplish their unit's mission in combat.

7. Tenets of MCISD/SATE. In order to maximize the potential of the MCISD/SATE process, it is critical for a professional, adaptable, and talented academic faculty member to effectively and efficiently implement the tenets identified below. These tenets are used to guide the development of Marine Corps training and education.

a. Readiness Driven. Expeditionary readiness is a continuous and never ending challenge. All training and education must orient on preparing individual Marines and OPFOR units for the KSAs required to shape the nation's force in readiness. This system focuses training and education resources to generate the ability to thrive in current and future operations within the Joint or Marine Air-Ground Task Force (MAGTF) environment. Recognizing the timeless and ever-changing nature of war results in continuous evaluation and improvement of Marine Corps instructional and training systems.

b. Learner-Centric. A learner-centric approach places the emphasis on the learning process rather than the content or academic faculty expertise. The intent of this approach is to minimize, if not eliminate, passive learning experiences in favor of active. It encourages student participation and puts the academic faculty member in the role of a facilitator. Facilitators are responsible for guiding discovery during relevant, context-based, collaborative, problem-centered instruction.

c. Integrated Training and Education. Intentional learning is comprised of an inseparable combination of both training and education that together builds individual Marine and unit expeditionary readiness. This concept is applied throughout the MCISD/SATE process through learning structures focused on behaviors and mental associations as well as professional and adaptable academic faculty. Chapter 2 will expound more on training and education integration.

d. Scalable and Adaptable. The MCISD/SATE process is a creative, iterative, meaningful, problem solving process for training and education that produces instructional systems, graduates, and evaluation feedback. It is flexible in that it allows for more than one solution to problems throughout based upon the content and context. The process serves as a

“toolbox” for practitioners at all levels to generate/revise instructional systems. While there are specific techniques and procedures captured within the phases of MCISD/SATE, it is in essence more of an art than a science.

8. Instructional Systems

a. By definition, a system is comprised of inputs, internal processes, and outputs, which together, accomplish the overall desired goal for the system. Systems usually contain smaller systems, or subsystems; which together interact on the main inputs towards the main outputs.

b. As an example, war itself is an open, complex, and adaptive system. Political objectives, military power, resources, populace factors, terrain, weather, and many other variables all interact with competing wills, violence, uncertainty, and friction across an ever changing background to consume the opponent’s resources, create casualties, and achieve actual or inferred military-political results. War is complex in that it is made up of dynamic networks of interactions with relationships that are not aggregations of individual static entities. It is adaptive in that the individual and collective behaviors modify and self-organize based on actual or perceived, operational events on the battlefield.

c. By comparison, an instructional system is intentionally designed to determine, define, effect, and measure learning necessary for individual or collective needs. Human competence gaps, learning audience, and available learning settings frame the instructional problem set as inputs. The internal MCISD/SATE processes interact to generate outputs of the system designed to resolve competence gaps and provide continual feedback to upgrade the system. MCISD/SATE is a creative process that yields an instructional roadmap or training plan to produce the tangible and intangible human capabilities needed by the Marine Corps across grades, functional areas, occupational groups, occupational specialties, billets, and units.

9. Marine Corps Training and Education System. The Training and Education System is the service-level application of the MCISD/SATE process used to define the requirements for each Occupational Field (OccFld), MOS, skill area, or capability.

a. Purpose. To provide the best trained and educated Marines to the OPFOR while assuring reasonable and practical allocation of resources - to achieve combat readiness with the lowest possible cost in dollars, people, and time. This is achieved by focusing first on Core Skills – those essential basic skills that "make" a Marine and qualify that Marine for an MOS – in order to achieve economy in time-to-train, instructor support, and equipment requirements for the Formal School. Core-plus skills – those advanced skills that are mission, rank, or billet specific - add to combat readiness, but require formal instruction which comes at a cost relative to time, instructor support, and/or additional resources. To be worth the investment, Formal School instruction for Core-plus skills must be decisively in the best interest of the Marine Corps.

b. Output. Products include defining training and education requirements in the form of Individual Training Events (ITE) or T&R manuals and the modification of requirements to focus on Core Skills. Other products may include Core-plus courses for either resident or nonresident instruction or performance support tools to allow Marines to accomplish some tasks without formal training. In some circumstances, shortened entry-level

training may benefit the Marine Corps by increasing the time that first-term enlistees spend in the OPFOR. In other circumstances, the unique and technical nature of an MOS may require lengthy schooling to ensure an adequate level of performance by school graduates. In other instances, the output may result in the development of career-level formal courses to raise the expertise of Marines as they become more senior. The measures of effectiveness vary with the needs of the Marine Corps, the health of the OccFld, and the Marines that make up the OccFld.

c. Endstate. The Training and Education System analyzes and establishes overall goals in each Occupational Field, designs comprehensive curriculum plans to best meet those goals, and manages the development, implementation, and evaluation of training and education to ensure that Marines are prepared to perform their job in a combat environment. The process is effective when employed by a team of representatives from the OccFld Advocate, the OPFOR, and the supporting establishment working toward common goals. Figure 1-2 is a graphic representation of what is taking place at the service level within the Training and Education System.

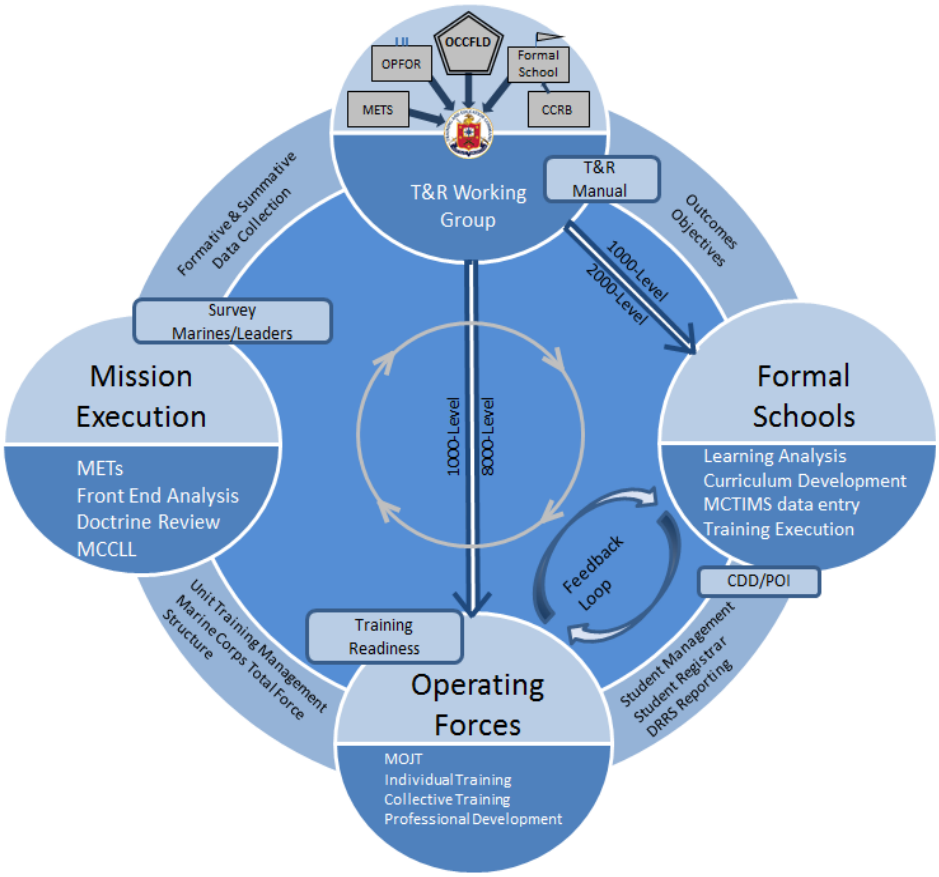

Figure 1-2.--Marine Corps Training and Education System

10. MCISD/SATE Instructional Design Process. The instructional design process adopted by the Marine Corps is separated into five phases: Analyze, Design, Develop, Implement, and Evaluate. These phases provide a “toolbox” for practitioners to produce the instructional systems required to cultivate readiness. Each phase builds upon the previous phase and can occur at any time, providing a system of checks and balances to ensure all instructional data is accounted for and that revisions to instructional materials are

identified and made. Procedurally, each individual phase involves inputs, processes, and outputs whereas the successive phase builds upon the output of the previous phase.

a. Formal School application. The MCISD/SATE 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 process; however, the selection of the best solution is the goal. For specific guidance on how MCU utilizes the instructional design model, contact the office of the MCU Vice President of Academic Affairs. Figure 1-3 is a graphic representation of how ADDIE is applied in Formal Schools.

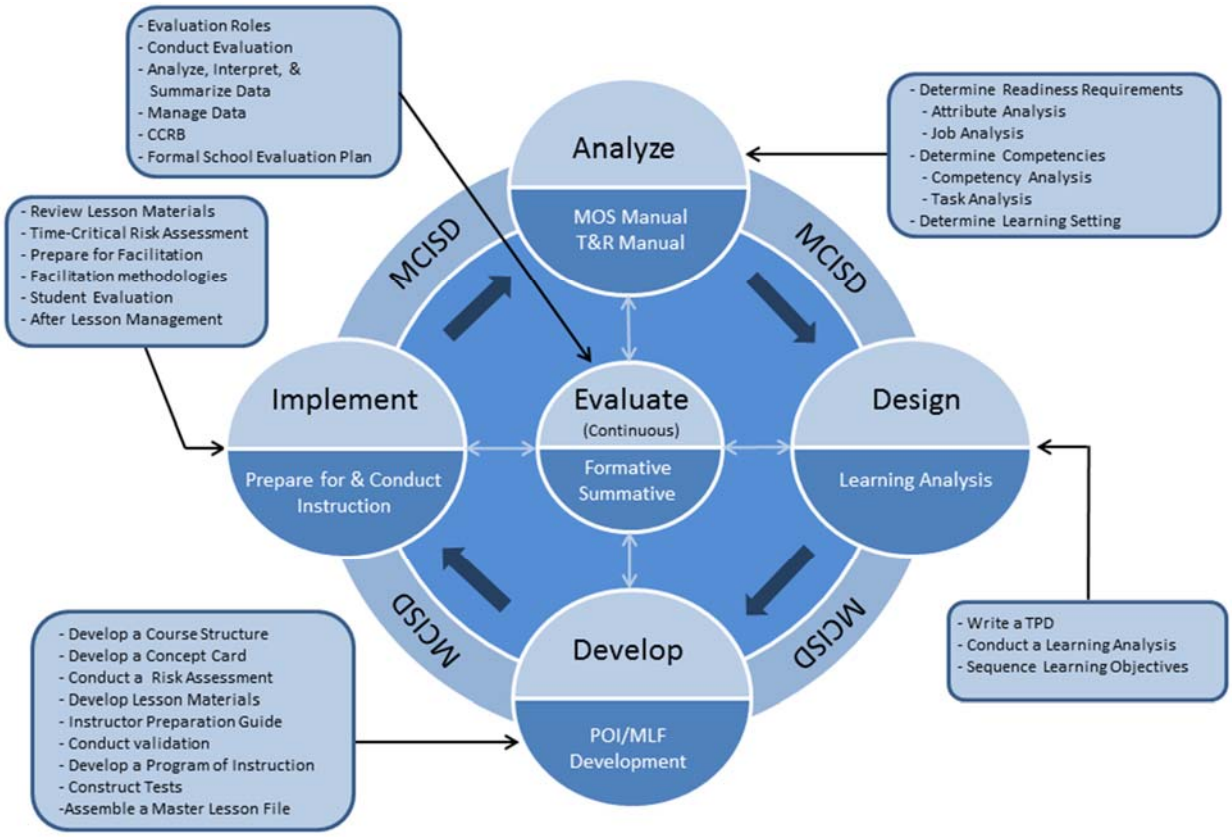

Figure 1-3.--MCISD/SATE in Formal Schools

b. OPFOR application. The alignment of UTM program development with the MCISD/SATE process facilitates a greater understanding and application of UTM overall. In addition to providing the Commander with a standardized method for the development of Mission Essential Task List (METL) based training plans, the alignment also facilitates the identification of rank specific train-the-trainer skill requirements. This alignment provides the flexibility for Marine leaders of any rank to be situated in the process for easy identification of the UTM skills. The TECOM Train-the-Trainer Integration (T3I) Program which is implemented in all skill and career progression courses is based on this concept. Refer to MCRP 3-0A, Unit Training Management (UTM) Guide for more comprehensive guidance on applying MCISD/SATE to UTM. Figure 1-4 is a “hybrid” graphic representation of how ADDIE is applied in the OPFOR.

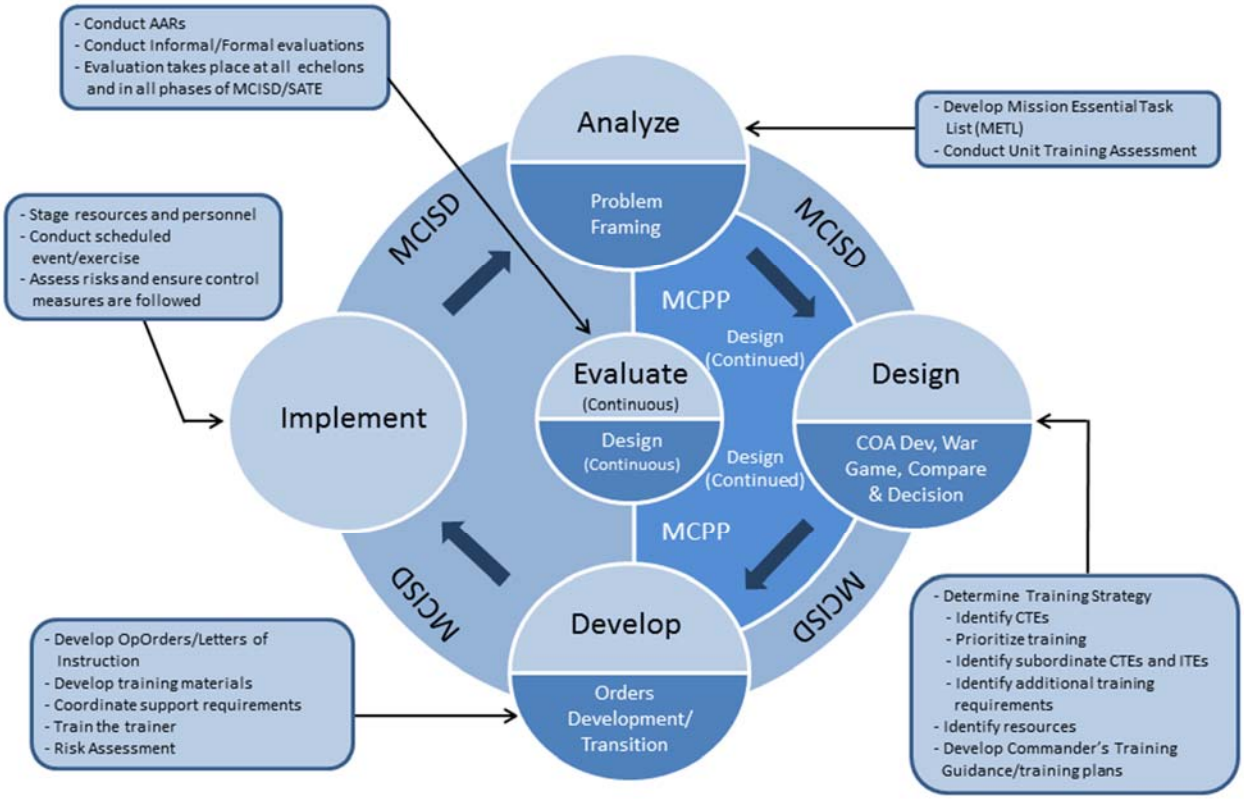

Figure 1-4.--MCISD/SATE in the Operating Forces

11. Synopsis of the ADDIE Process

a. Analyze. During the Analyze Phase, readiness requirements and Marine competencies are analyzed to determine service-level learning structures necessary to build readiness. This is conducted sequentially through two sets of sub-processes: MOS Analysis/Job Analysis and Outcome Analysis/Task Analysis. Throughout this process the learning setting is also determined for each T&R event. The output is an update to the MOS Manual and the development of a T&R Manual. Target audience: TECOM Task Analyst (TA) and other service level stakeholders (e.g. PP&O, MMEA, MMOA, OPFOR). Figure 1-5 illustrates the inputs and outputs of the Analyze Phase.

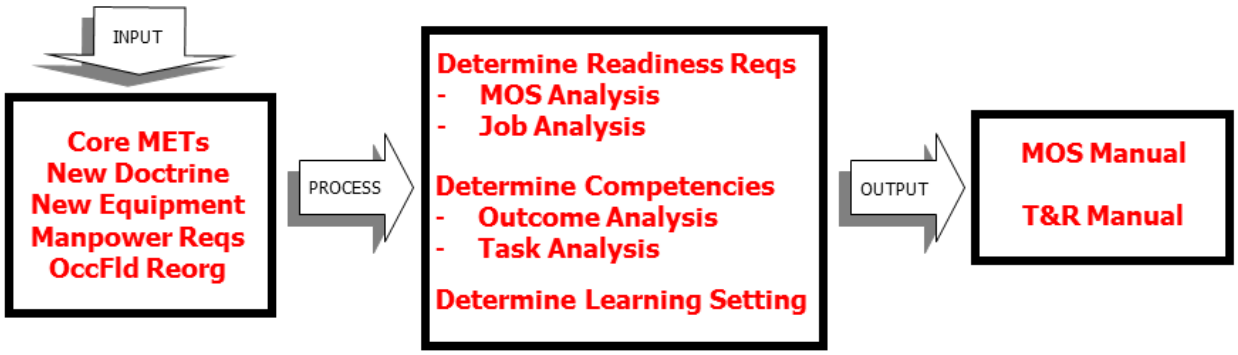

Figure 1-5.--Analyze Phase Flowchart

b. Design. During the Design Phase, the framework for instructional and assessment strategies is created by using the service-level learning outcomes

developed during the Analyze Phase to guide the creation of course and subordinate learning outcomes in addition to the conduct of a systematic process called a Learning Analysis. The output is the documentation of the learning institution competencies within an initial course framework. The main processes of the Design Phase are: Write a Target Population Description (TPD), Determine Course Learning Outcome, Conduct a Learning Analysis, Sequence Learning Objectives (LO), Determine Subordinate Learning Outcomes, and Determine Assessment Instruments for Learning Outcomes. Target audience: Curriculum developers and Academic faculty. Figure 1-6 illustrates the inputs and outputs of the Design Phase.

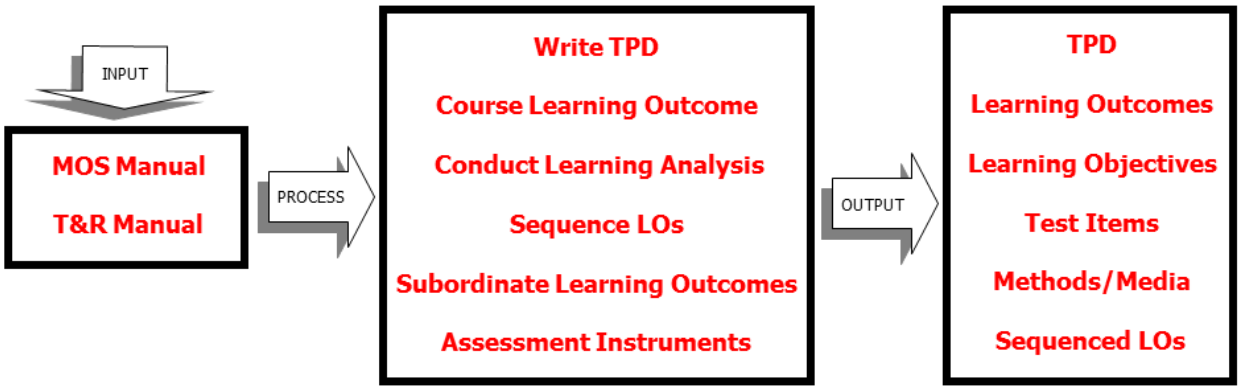

Figure 1-6.--Design Phase Flowchart

c. Develop. During the Develop Phase, developers complete the structure for the course, capture resource requirements, document the instructional system, and prepare materials necessary to conduct instruction. The output is the Program of Instruction (POI) and associated Master Lesson Files (MLFs). The main processes of the Develop Phase are: Develop a course structure, Develop a concept card, Develop a POI, Conduct a Risk Assessment (RA), Develop lesson materials, Construct assessments, Construct Tests, Conduct Validation, and Assemble a MLF. Target audience: Curriculum developers and Academic faculty. Figure 1-7 illustrates the inputs and outputs of the Develop Phase.

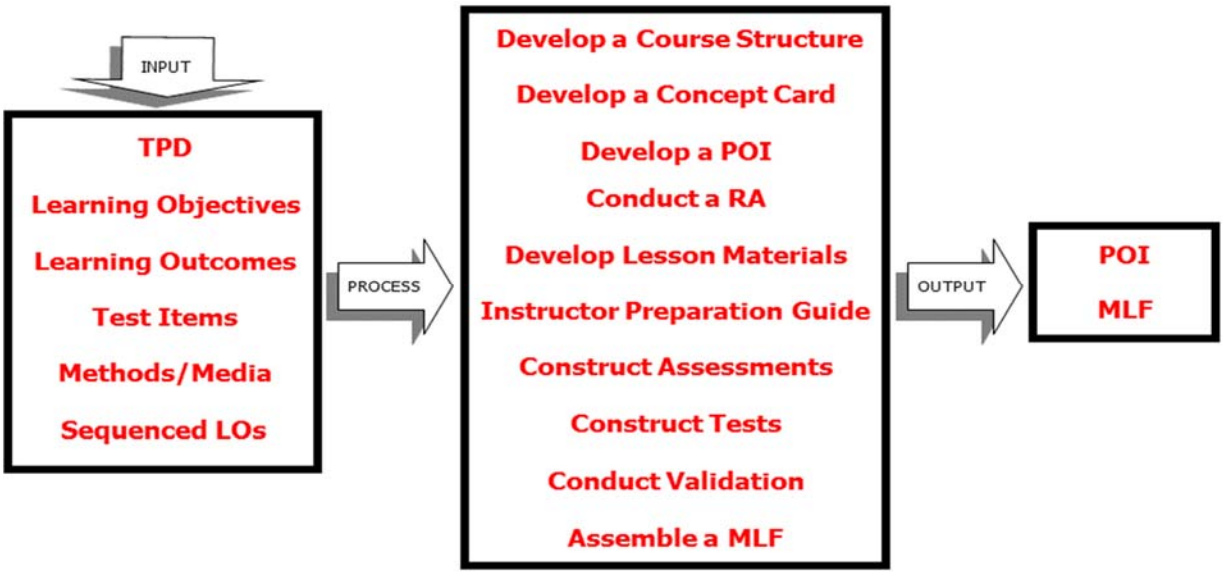

Figure 1-7.--Develop Phase Flowchart

d. Implement. During the Implement Phase, academic faculty prepare the learning environment, facilitate and evaluate learning, and conduct after lesson management. The output is learner mastery of behaviors and progress towards mental associations, graduates better prepared for operational demands, and course data. The main processes of the Implement Phase are: Prepare for facilitation; Establish a learning environment; Deliver instruction; Instructional Strategies, Tactics, and Techniques; Assess effectiveness of instruction; and After lesson management. Target audience: Instructors. Figure 1-8 illustrates the inputs and outputs of the Implement Phase.

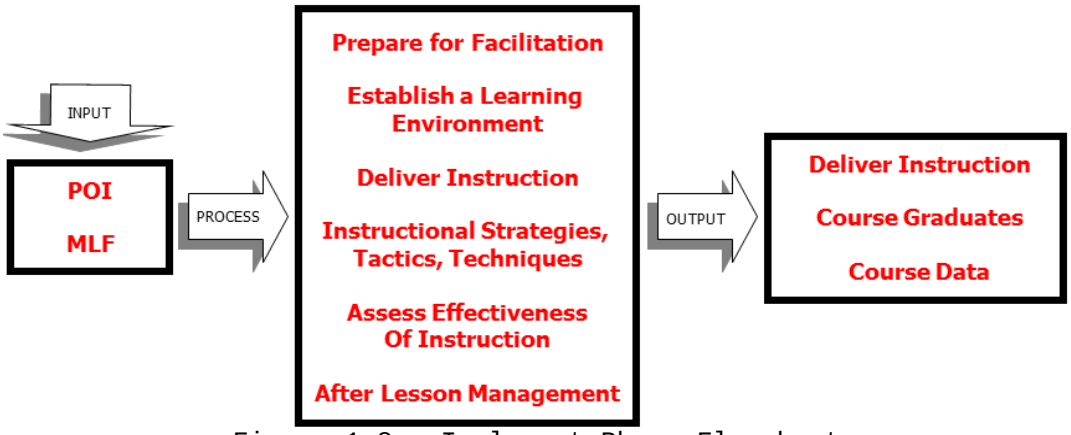

Figure 1-8.--Implement Phase Flowchart

e. Evaluate. During the Evaluate Phase, evaluation is used to ensure that instructional systems are current, relevant, effective, and efficient to meet the demands of training readiness. The Evaluation Phase is integrated with ongoing revisions throughout each element of the MCISD/SATE process and continues throughout the lifecycle of the instructional system. The output is a summary of findings and change recommendations to any aspect of the instructional system (e.g. service-level learning structures, course learning structures, faculty development, Standing Operating Procedures (SOP)). The main processes of the Evaluate Phase are: Plan evaluation; Conduct evaluation; Analyze, Interpret, and Summarize data; Manage data; Course Content Review Board (CCRB); and Formal School Evaluation Plan. Target audience: All stakeholders (e.g., Analysts, Developers, Designers, Implementers, Evaluators, Academic faculty, Students). Figure 1-9 illustrates the inputs and outputs of the Evaluate Phase.

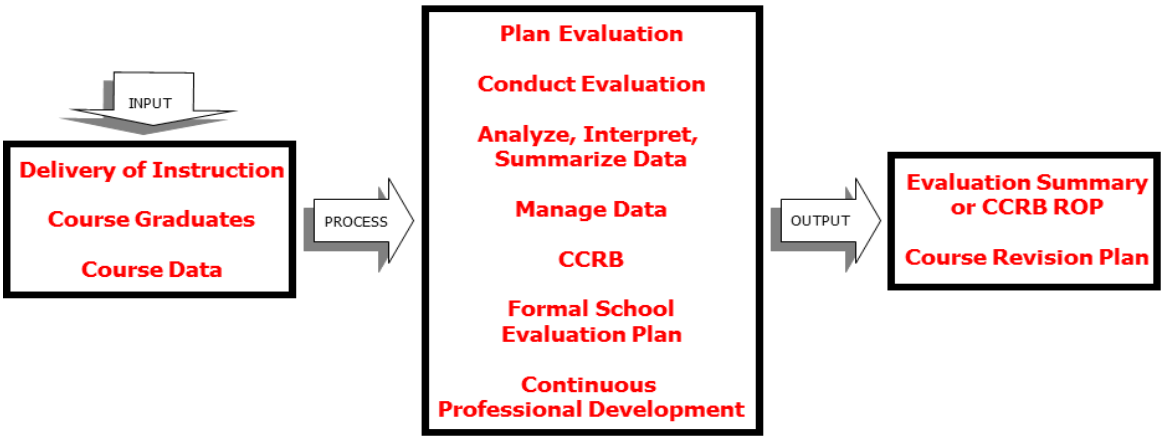

Figure 1-9.--Evaluate Phase Flowchart

CHAPTER 2

TRAINING AND EDUCATION

"The Marines of our Corps represent the American people who we have sworn to defend and protect. Through our recruiting, training, education, and retention of superb, talented, and committed men and women, we will enhance the quality and diversity of our Corps, and ensure that we maintain our ability to remain the Nation's pre-eminent force-in-readiness."

- Gen Neller, 37th Commandant of the Marine Corps

1. Introduction. Training and education are the two interdependent means to achieve learning required for operational demands. Each complements the other as they sustain the transformation along a continuum of professional development to produce tactically and technically proficient warriors who can think critically, apply military judgment, and make ethical decisions to solve complex problems in an environment of ambiguity and uncertainty. Training and education are mutually supporting efforts; just as the skillful execution of combined arms in combat produces the greatest bid for success, so too does the expert application of both training and education produce the most capable Marines and Marine units. The single most important aspect to understand about this concept is that instruction and exercises in any learning environment are comprised of an inseparable combination of both training and education that together builds individual Marine and unit readiness.

2. Training

"In order to develop initiative among junior leaders, the conduct of training - like combat - should be decentralized. Senior Commanders influence training by establishing goals and standards, communicating the intent of training, and establishing a main effort for training. As a rule, they should refrain from dictating how the training will be accomplished."

- MCDP 1, Warfighting

a. Reference (e) defines training as "the process by which skills are developed through progressive repetition of tasks commensurate with required capabilities." It is the means for changing tangible behaviors and related mental associations found within the domains of learning. It focuses on habits of thought and habits of action, which establishes what to think and how to act as Marines both individually and collectively. Training prepares Marines for the science of war (declarative/procedural knowledge): the facts, the techniques, the procedures, and the simple attitudes of receiving and responding. Training provides techniques and procedures which emphasize speed, accuracy, physical toughness, and physical courage. It can be executed across three domains or a combination thereof: Live, Virtual, and Constructive (LVC) or a combination thereof.

b. As noted in reference (f), the current operating environment is volatile and complex. Americans expect their Marine Corps to be most ready when the Nation is least ready. Readiness is not defined by just our equipment, supply, and maintenance. Readiness also accounts for the quality and challenging nature of our training, and the mental, spiritual and physical preparedness of Marines and Sailors across the force. Readiness does not just happen. It is the result of a variety of actions: commitment

by leadership, standards-based inspections, evaluated drills, and training exercises. The Commandant recognizes that in order to meet current and future challenges, the Nation will rely heavily on the Marine Corps to be ready, relevant, and capable. While there will be consistency in our missions, we must be willing to experiment, take risk, and implement change to overcome those challenges.

c. Historically, training has been described in many different ways and has often been considered in isolation in the past as only those efforts that result in the cultivation of skills. To say that an exercise is a training exercise is not to say that it excludes education. Training readies Marines and units for uncertainty on the battlefield through the transference of weapons capabilities, reports formats, techniques, procedures, and willingness to respond to commands. We recognize that a Marine learning about a machinegun's rates of fire, operation, function, and immediate actions is undergoing some form of training. In contrast with education - which we explore in a moment - the Marine learning basic principles and concepts relative to employing those machinegun KSAs is undergoing some form of education.

d. Training should also be considered from the perspective of differentiating between types of knowledge to be acquired by Marines participating in the instructional process. Two questions one may ask relative to training are:

(1) Is the knowledge to be acquired necessary to describe the environment that Marines operate in (as in the case of facts such as a weapon's maximum effective range)? If so, training must require and be evaluated against the learners' newfound or improved ability to name, explain, or talk about what has been learned in terms of meaningful standards.

(2) Is the knowledge to be acquired necessary to facilitate skills (as in the case of learning about the steps to perform remedial action on a weapon before attempting to do so)? If so, training must establish structured processes that evaluate learners' ability to act and do things; to perform tasks, in keeping with meaningful standards (e.g. speed, accuracy).

e. While initial training focuses on the lower levels of the learning domains, training tends to atrophy without use and thus requires repetition and sustainment in order to provide a foundation for the variation, adaptation, and enduring thought that education fosters. Because training is heavily emphasized early in a Marines' career, it is never isolated from, nor far removed from, education.

3. Education

"The intuitive approach (to decision making) is based on the belief that war being ultimately an art rather than a science, there is no absolutely right answer to any problem."

- MCDP 6, Command and Control

a. Education is the process by which knowledge is attained in order to develop the analytical skills and critical thinking capability to enable Marines to adapt quickly in any environment. It conveys the broad body of knowledge and develops the habits of mind that are essential to the military professional's expertise in the art and science of war. Education programs

prepare leaders to think critically, apply military judgment, and make ethical decisions to solve complex problems in an environment of ambiguity and uncertainty. In plain terms, education focuses on “how to think” not "what to think." It prepares Marines for applying the art of war (implicit knowledge): the analysis or synthesis of knowledge, the adaptation or origination of skills, and the cultivation of values. Education can be evaluated by measuring and assessing many possible results towards the ultimate aims of achieving designated learning outcomes (e.g. creativity, military judgment, adaptability, moral courage, mental toughness).

b. Education has been subject to misconceptions and construed as only those classroom activities in the pursuit of knowledge. To say that a Marine gained an education from a classroom lecture is not to say that the Marine was not also trained. For example, training centric KSAs such as the introduction, acquisition, or reinforcement of facts, techniques, or procedures may be a part of a lecture that also educates the high order KSAs associated with employment, judgment, or analysis to creatively apply the training.

c. Reference (j) states “...good tactics depend on sound technical skills.” The science builds to and facilitates the art. Education relies on the training to provide the context and foundation for variation, creation, and adaptation. Education is heavily emphasized later in a Marine’s career, since it rests on the foundation training provides. It is noted that the Marine learning to employ a machinegun based on varying conditions of the mission, enemy, troops and fire support available, terrain and weather, time, and civil considerations is also being educated. Problem-based instruction and exercises best facilitate education for the demands on creativity, judgment, adaptation, and other higher order behaviors.

4. Training and Education Integration

“Training and education are not mutually exclusive. Virtually all military schools and professional development programs include elements of both education and training in their academic programs. Achieving success across the joint learning continuum relies on close coordination of training and education to develop synergies as personnel develop individually over time, acquiring and performing progressively higher skills and responsibilities as their careers advance.”

- CJCS OPMEP

a. The Marine Corps must challenge and inspire learners who have grown up in a digital world, are adept at using technology, demand relevance, and require feedback and support from peers and mentors. It must also challenge and meet the needs of seasoned Marine professionals who have experienced repeated deployments and bring a wealth of knowledge to the learning system.

b. Current instruction is typically based on individual tasks, conditions, and standards, which works well when the Marine Corps has a well-defined mission with a well-defined enemy. However, due to the versatility of today’s battlefield, the Marine Corps learning process has to be equally adaptable in order to deliver purposeful and relevant instruction to today’s adult learners. Student-centered learning methods are the goal of Marine Corps instruction and should be at the forefront of the curriculum design and development process.

c. A combination of science and art is necessary to meet the demands of warfare. Therefore, training - which cultivates the science without any tie to education - fails to adequately prepare Marines for the nature of war. For example, Marines that have been trained to perform immediate action on their weapon must also learn to determine when and why to perform immediate action in order to best prepare them for the uncertainty that pervades the battlefield. Moreover, education relies on the tangible foundation provided by training as a basis for variation in the preparation for uncertainty. The Marines employing supporting arms to put the enemy in a combined arms dilemma must first assess the tactics, techniques, and procedures for each asset (e.g. firing agency, ammunition capabilities, aircraft capabilities, gun target lines, airspace deconfliction) before creatively combining them to achieve the desired effects despite unknowns about the situation. For these reasons, training should not be conducted without connection to the resulting and enduring education. So too, education should be paired with training. According to reference (j), we must leverage instruction and exercises to this end as they "...serve to integrate training and education, producing a whole greater than the sum of its parts."

d. In an era of persistent conflict, formal school and unit training and education must remain on the cutting edge in order to prepare Marines, leaders, and units to operate and succeed in uncertain operational environments where the Nation's enemies continue to adapt quickly using the full range of threats. To continue success, they must hone necessary capabilities and develop small unit decision makers that become comfortable with collaborative planning and decentralized execution, have a willingness to deal with ambiguity, and make rapid adjustments as situations develop. Marines must learn from realistic experiences and opportunities that integrate technological capabilities and introduce conditions of ambiguity to develop the trust and confidence required for successful execution of decentralized operations.

e. Having established the essential connection between training and education to accomplish the military learning required for readiness, the question becomes apparent as to how do we differentiate between training and education during execution? Finding a clear division between training and education in any instruction or exercise is a challenge. Both are similarly focused on changing behavior and mental associations in the three domains of learning; training orients on the tangible KSAs and education orients on the intangible KSAs as identified in Figure 2-1. However, the conduct of training-focused instruction also generates education results, while the conduct of education-focused instruction also reinforces training. For example, instruction on a weapon's immediate and remedial actions changes lower order behaviors that are necessary to perform each task, but it also changes the higher order critical thinking and evaluation to determine when and why as well. In the same light, instruction on tactical planning and orders reinforces the lower order recall of the operations order format and the guiding acronyms for tactical planning at the same time it develops the higher order thought to synthesize the estimate of the situation into the origination of a unique operations order. The key to determining the appropriate mix of training and education is to measure learning results through objective and subjective evaluation.

f. In any learning environment, it is rather a blurring or a blending that occurs where training and education meet. In planning and conducting instruction and exercises we still target the lower or higher order behaviors for change, yet we recognize that whether we intended to train or we intended

to educate, we produce effects on both - as we must to ready Marines and units for expeditionary operations and the conduct of war.

g. In Figure 2-1, the emphasis placed early in a Marine's career is on training with some education. In the middle of the continuum, training and education are more equally balanced. As a career continues the emphasis between training and education shifts primarily toward education with some training. This shift in focus is due to the foundational role of training to education. Baseline tangible KSAs are essential before moving to more intangible ones. While students at Entry Level Training (ELT) schools (enlisted and officer) must focus heavily on training, education is still present. Both settings use education to foster and evaluate intangibles such as Marine ethos or leadership potential.

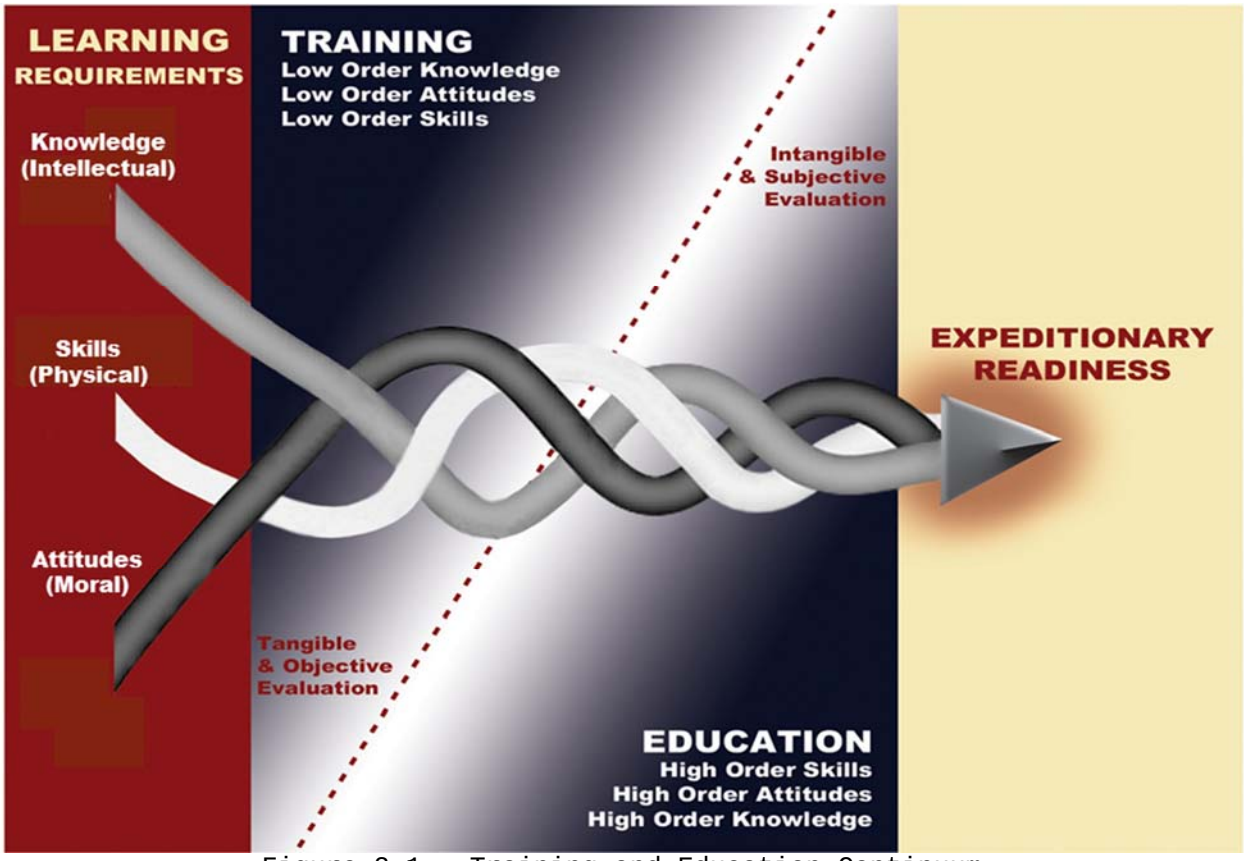

Figure 2-1.--Training and Education Continuum

5. Outcomes and Objectives

"There are two parts to any mission: the task to be accomplished and the reason or intent behind it. The intent is thus a part of every mission. The task describes the action to be taken while the intent describes the purpose of the action."

- MCDP-1, Warfighting

a. Outcomes Based Training and Education. Training is often the vehicle to cultivate education which in turn, informs and focuses the training. Much like any mission, instruction and exercises have two parts: the task to be accomplished and the outcome or purpose of the task. Outcomes based training and education focuses on the total development of the individual relative to

the wartime mission. We use outcomes to guide the conduct of training and education through well prepared instructors and unit leaders who artfully bring the outcomes into focus across instruction or exercises. Learning objectives are the “short term” learning contract whereas learning outcomes are the result of multiple learning experiences that provide the “long term” learning contract.

(1) Learning Objective. A learning objective is 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. They focus on specific types of performances that the Marines must demonstrate. Learning objectives, typically, are the intended observable changes that occur due to instruction, curricula, programs, or activities.

(2) Learning Outcome. A learning outcome is a statement that specifies how learners will “be” as a result of the learning experience. Service-level outcomes are defined beginning with the Core Mission Essential Tasks (MET) and are codified within the MOS Manual and T&R Manual when determining readiness requirements during the Analyze Phase. During the Design Phase, course learning outcomes and subordinate learning outcomes are developed to support the building block approach and ultimately align with the Core METs.

(a) The use of learning objectives has been formalized over time in the Marine Corps; however, learning outcomes have not been as widely used within Formal Schools during curriculum development. It is understood that current policies provide constraints and restraints to this process, so this version of MCISD/SATE will provide clarification and rectify these concerns. Although many Formal Schools are incorporating outcomes into their learning structures, it is not a “one size fits all” solution. The MCISD/SATE provides guidance on the creative process of integrating outcomes at all levels.

(b) A learning outcome provides the means to identify long term goals across learning domains that support both Marine Attributes and Marine Competencies. Stated another way, a learning outcome is an intended effect of the learning experience. A learning outcome may be inferred through behaviors across the scope of observation. For example, evaluating a learning outcome over time throughout a course could involve evaluations throughout a myriad of teaching methods, as well as during administrative and non-academic interaction. It is not observable and measurable on its own as a standalone assessment. Mental associations as learning outcomes are internal thought processes that are inseparably connected with behaviors that help us see and assess through inference that something has changed--that learning has occurred.

(c) Although, the broadening of curriculum development processes to allow the inclusion of learning outcomes in a POI might sound significant, in reality there will not be a drastic change in the way the Marine Corps conducts training and education. It will, however, provide options for flexibility in the way a learning analysis is conducted. The use of learning outcomes carries with it nuances that will need to be adhered to when utilizing them in the curriculum design and development processes. The intended use is to ensure that the academic faculty members teach what they claim to teach and that students learn what they are supposed to learn. It

is also important that the institution identifies the learning outcomes that are expected and then assess whether or not the institution achieved these outcomes.

(d) The combination of training and education with the use of outcomes accomplishes the military learning required for expeditionary readiness and builds Marines able to operate on a changing and uncertain battlefield. In this way, our foundational Warfighting doctrine is at work in our approach to training and education. Although the implementation of learning outcomes requires revisions to several overarching policies, there is an abundance of research available relative to outcomes based training and education. The preceding paragraphs were not meant to be comprehensive by any means, but rather to provide common definitions and terminology as they are applied to the Marine Corps and specifically to the MCISD/SATE process.

(3) Mastery vs. Progress. Learning structures for behaviors lend themselves to a mastery learning orientation. This means that learners must exhibit observable behaviors that are evaluated to a concrete or abstract standard. Anything that can be seen can be measured. Some behaviors will be more tangible permitting objective evaluation while other behaviors will be intangible, requiring subjective evaluation. Learning structures for mental associations are more difficult to measure. Behaviors related to the mental association provide windows into these inner changes and permit direct or inferred measurement. The long term purpose provides a guiding function for academic faculty members and an aspirational goal for learners. Although mastery of a skill is typically assessed and evaluated using an appropriate testing tool, true mastery is not feasible to determine in relatively short periods of time when associated to Marine Corps instructional systems; however, positive progress is possible to assess and measure. Learning structures for mental associations then lend themselves to progress-learning orientation.

6. Conclusion. Training and education has always been interrelated in the curriculum development process, however, the process was never truly codified in a way that permitted their use in a practical manner. Although the Marine Corps mindset is to “Train to Fight”, we must not also forget that in the process of training and building Marines, there is an educative element to this construction. Training for a skill, MOS, or mission is only part of the equation. If the Marine Corps is truly intent on creating a forward thinking, creative, and prepared small unit leader to make better decisions, then training and education must be integrated into all facets of curriculum development. In doing this, the Marine Corps Training and Education System and the MCISD/SATE instructional design process merge to create a holistic and well-rounded process for the integration of training and education.

CHAPTER 3

ADULT LEARNING

"From recruit training through senior Staff NCO professional military education (PME) and from Officer Candidates School through our Senior Leader Development Program, we must continue to build thinking, decisive, innovative Marines, imbued with initiative and empowered to act within the construct of commander's intent and in the face of potentially confusing, chaotic and unclear situations."[1]

1. Introduction

a. The education of service members has been around as long as the military itself. George Washington recognized a theme of illiteracy among his troops during the Revolutionary War.[2] Deciding this needed to change, Washington used Chaplains to provide instruction to the soldiers to improve their literacy rates. This concept was used not only as a means to educate the troops, but also to improve spiritual welfare and overall morale.

b. Over the past 50 years there has been rapid growth in adult education and with this growth, the adoption of its principles has become part of learning in the military. Statistics show that the Department of Defense (DoD) is the largest provider of adult education, offering training and education to more than 3.2 million members.[3] The Marine Corps follows suit with the large number of adults trained.

c. Adult learning, on its own, does not fulfill the needs of training and education in the Marine Corps. Formal School Academic faculty is an integral part of these processes. Those involved, whether during design or facilitation, need to ask what motivates adults to learn and recognize the shared responsibility between the academic faculty and the learner.

d. This chapter is intended to assist those individuals assigned as academic faculty members throughout the Marine Corps. It will address adult learning, discuss the adult learner, and methods of instruction and design. The intended use of this chapter is not to provide a "one size fits all" approach to training and education. The intent is that those involved with Marine Corps training and education will be provided with a foundation of knowledge, methods, and discussion points that will guide them in their billets, as well as provide a point of departure into self-improvement and professional development.

2. The Foundation

"If you have built castles in the air, your work need not be lost; that is where they should be. Now put the foundations under them."[4]

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[1] Marine Corps Vision & Strategy 2025

[2] Kime, S. F., & Anderson, C. L. (1997). *Education vs. training: A military perspective*. Washington, DC: Servicemembers Opportunity Colleges.

[3] Persyn, J. M., & Polson, C. J. (2012). Evolution and influence of military adult education. *New Directions for Adult and Continuing Education, 2012*(136), 5-16. doi:10.1002/ace.20031

[4] Thoreau, H.D. (1995). *Walden, or, Life in the woods. New York: Dover Publications.*

a. Malcolm Knowles. Andragogy is defined as the art and science of teaching adults and is a term adopted by Malcolm Knowles to describe the emerging ideas about adult learners. Knowles is identified as a pillar in adult learning. He is not only credited with the adoption of the term andragogy, but also for his assumptions about learners. This series of assumptions, guides how he views learning by adults. Knowles developed his model and used it to differentiate andragogy from pedagogy, which is the teaching of children. The reason being, that children do not have the experience necessary to draw from in order to be self-directed in their own learning. This is relevant to Marine Corps instruction as this may reflect the transition and growth of learners within the Marine Corps. As they progress through their careers, they increasingly become self-directed. Assumptions of both types of learners will be further discussed in the adult learner section.

b. Marine Learners are Adult Learners. In Marine Corps training and education, it is about encouraging Marines to become autonomous learners while empowering them with knowledge, skills and understanding needed for working and living in the military and society in general.[5] This is not a simple task; it means an academic faculty needs to have an understanding of some of the framework within adult education. This will provide tools that will assist those in academic faculty roles to provide a quality training and education environment for the learner.

3. The Marine Learner

"Leading Marines is the most important responsibility in our Corps, and thus we must educate the heart and mind to prevail on the battlefield and in the barracks, in war and in peace."[6]

a. Understanding the Learner. In order to facilitate the process of learning it is important to understand the learners' needs, motivations, learning tendencies, physiological limitations and social influences. These provide insights into understanding the adult learner. Using the methods set forth in this handbook, academic faculty members can have a deeper understanding of the adult learner and ultimately generate the most effective and lasting learning experience for Marines.

b. Needs of the Learner. Humans are dominated by progressive needs which if not met, interfere with learning at an often unconscious level. While implementing the MCISD/SATE process, academic faculty must consider meeting the learners' basic needs prior to reaching higher order needs. For example, Marines engaged in a lesson on a given subject that are denied basic needs, such as a bathroom break, will unconsciously become less effective learners. Another example is that a Marine who is ridiculed in front of a classroom could shut down towards learning, due to damage to social belonging and esteem needs. In response to this, faculty members must ensure that the needs of the learner are considered and addressed. In addition, developers should consider the timing of a course and ensure breaks are included. Leveraging an understanding of human needs contributes to our ability to maximize a Marine's ability to learn. This is shown in Figure 3-1, where in

[5] Kime, S. F., & Anderson, C. L. (1997). *Education vs. training: A military perspective*. Washington, DC: Service members Opportunity Colleges.
[6] Amos, J.F. (2014). *Foreward, Leading Marines, MCWP 6-11*

order to reach self-actualization the adult learner must first seek fulfillment of the needs below it.

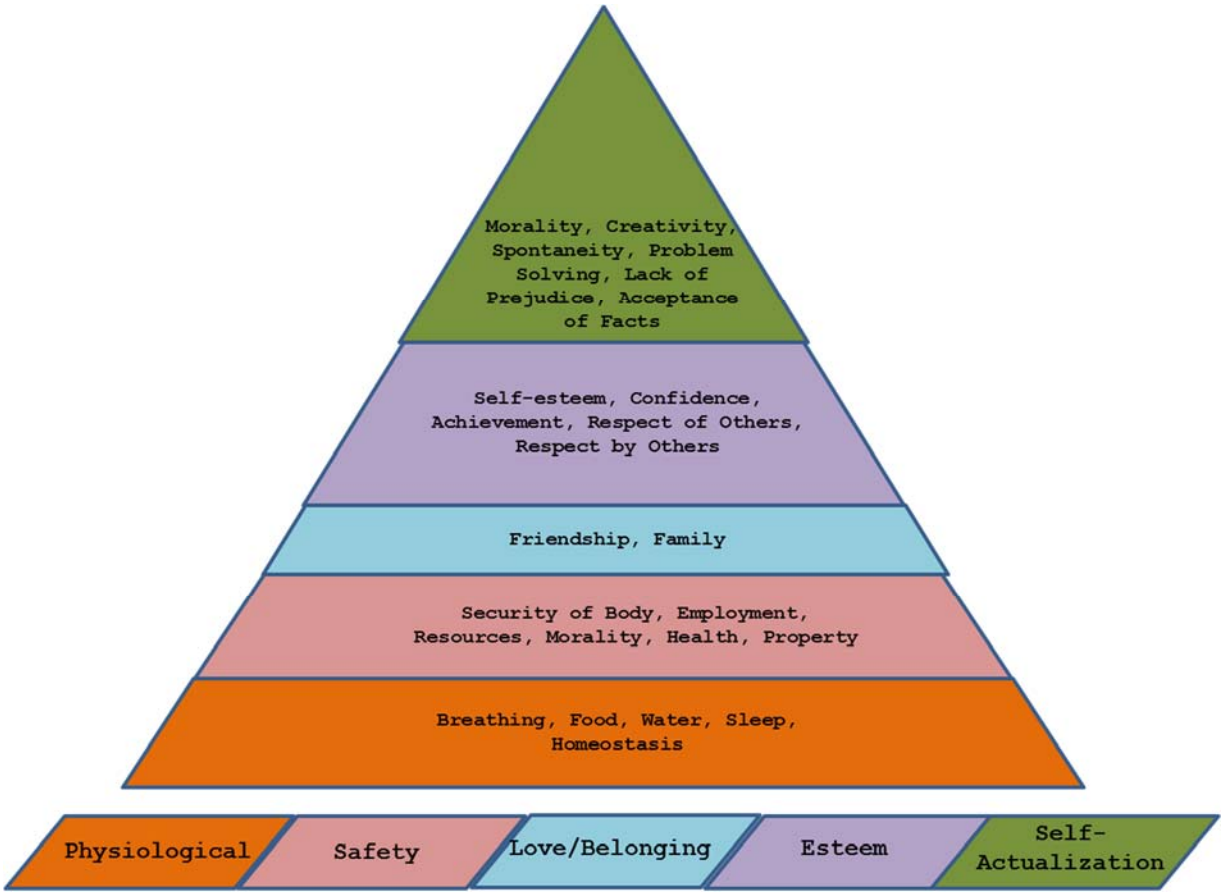

Figure 3-1.--Maslow's Five Staged Hierarchy of Needs[7]

c. Assumptions about Learners. Understanding the basic needs of the learner is the first step to assist them in reaching their full potential. The art of instructing is about having an understanding of the assumptions that are made about learners. Academic faculty members must realize that delivering curriculum is going to rely heavily upon the status of their students. Knowing a Marine's level of experience, understanding, and motivation to learn is not just important for developing the TPD, but also to ensuring an effective learning environment. By developing new Marines through an introduction of adult learning methodologies, the Marine Corps may later gain the reward of a life-long learner. Two sets of assumptions are important to consider: One about basic learners and the other of more experienced learners. Understanding these assumptions can improve curriculum design and instruction for particular learners.

(1) Basic Learner. There are assumptions that align with the basic learner, as identified in Appendix C, and should be noted by curriculum developers. As training and education move further away from Entry Level Training (ELT), the target population should no longer be looked at as the

[7] Maslow, A.H. (1943). A Theory of Human Motivation. *Psychological review,* 50(4), 370-396

basic learner. As such, the design of the curriculum should progress away from aligning with these assumptions.

(a) Marine Corps recruit and officer candidate training is a rite of passage where civilians are transformed into Marines. At this level, whether it is a recruit standing on yellow footprints or an officer candidate on the blacktop at Brown Field, the individual has little experience with the Marine Corps way of life.

(b) There are two key assumptions of the basic learner to focus on. The first is that the learner is dependent on the instructor. This means the learner is set to receive; a passive learner. The instructor bears the responsibility of ensuring learning has occurred. The second assumption to note is that people are motivated to learn primarily by external pressures, grades, incentives, and other motives. This particular assumption demonstrates how at times, especially in ELT, the motivation of the learner is often external. However, external motivation alone negatively impacts the learner's long-term knowledge retention levels.

(2) Experienced Learner. As Marines move forward in their career, the learning characteristics they exhibit should be more in line with the experienced learner.

(a) Academic faculty members should be providing lessons that are assisting learners in their progression and shifting them from a learner that is set to receive to one capable of sharing in the responsibility of their education. Remember, today's entry-level Marine learner is tomorrow's Staff Non-Commissioned Officer (SNCO) instructor.

(b) Likewise there are two key takeaways from the second set of assumptions about the adult or more experienced learner. The first is that learners feel the need to learn. As learners move toward being self-directed, they are closer to being able to seek their own self-improvement. The second is that learners participate actively in the learning process. As learners progress, not only will they feel they have a reason to learn, they'll take an active part in it.

d. Characteristics of Adult Learners

(1) Learner Experience. Through prior experiences, Marine 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. This applies to the instructor and developer because prior experience will drive the TPD. It will also drive how the course is taught. A recruit or new Marine's experiences will vary from an 18 year-old with little life experience, to a 25-year old college graduate. At the other end of the spectrum, a SNCO will bring experience to a PME classroom. Experiences should be considered and applied during a course to enhance all learners' experience.

(2) Readiness to Learn. In some forums, Marine learners are directed to participate in a training and education forum vice voluntarily attending by choice. This can affect their motivation to learn and more importantly their readiness to learn. It is easy to place students in a learning setting and have them hear a lecture or demonstrate a skill. It is more difficult to ensure that learning has occurred and is transferrable to practice. Learners

reach periods in their lives where they are more ready to learn than others and apply information they receive, based on their situation.[8] This stage is commonly referred to as a "teachable moment". Instructors need to consider this when tasks are being introduced. Effectiveness increases when the tasks are injected at the right time and provides a better opportunity for the students to learn and retain the intended information because their readiness is elevated.

(3) Motivation. Motivation drives adult learners, whether or not the learner is aware of it. Whether internal or external, it is useful to consider motivation when training and educating Marines. It is important to understand the differences in motivation because as Marines progress, they should be less reliant on external motivation and more on internal.

(a) Intrinsic Motivation. Defined as motivation from within the learner and may be consciously driven. Intrinsic motivation is a critical element in cognitive, social, and physical development. Intrinsically motivated learners are more likely to engage in the task willingly as well as work to improve their KSAs to increase their capabilities. Learners gain internal motivation when they feel they are either in control or have some control in what is going on around them. This is referred to as the "locus of control". People with an internal locus are those that believe they can have an effect on their lives. Those with external locus think along the lines that their actions bear no results, or a lack of control of results. For instance, a terminal Corporal may not be as motivated to seek out completion of Corporal's Course and if assigned to it may not be motivated to do well. On the other hand, hearing an experience from a SNCO may provide a junior Marine with the motivation to drive toward success.

(b) Extrinsic Motivation. Defined as motivation external to the learner and refers to the performance of an activity in order to attain an outcome. Common examples are rewards for showing the desired behavior, or the threat of punishment following misbehavior. Competition is an extrinsic motivator because it encourages the performer or group to win and to beat others.

(4) Orientation to Learning is Life Centered. Learning must have applicability to students. Learners are motivated to the extent they feel the new knowledge or skills will help them in their daily lives. Instructional materials should address real situations, examples, and concerns. Academic Faculty members can demonstrate the relevance of concepts by relating examples to their students, or alternatively, have the learners make their own connection between the new material and their existing experiences.

(5) Personality. Personality types drive preferences for learning as well as for teaching. Personality has to do with individual differences among people in behavior patterns, cognition and emotion. These differences stem from a person's nature (their genetic design received from their parents) as well as their nurture (how they were raised/schooled/acculturated over time). These two dynamics combine to shape and shift personality. Common characteristics of these models are that adult learners tend to align

[8] Havighurst, R.J. (1972). *Developmental tasks and education* (3rd ed.). New York: David McKay Company, Inc.

across four general temperaments that are bounded by concrete experience, reflective observation, abstract conceptualization, and active experimentation approaches (See Figure 3-2). What this means to academic faculty is that personality drives the learner's approach to learning, teaching, leadership, and counseling. Academic faculty must account for these diverse approaches both in learning and in teaching to affect the learning required by the demands of readiness. In addition to this example, there are many variations of personality tests and models, some of which are found in Appendix C under learning personalities.

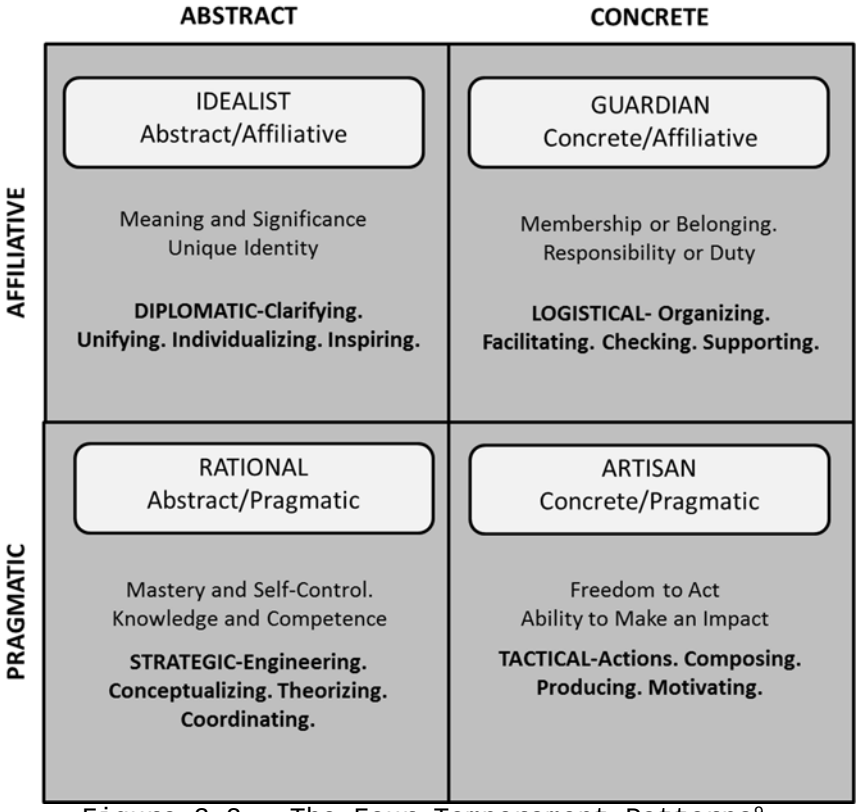

Figure 3-2.--The Four Temperament Patterns[9]

e. Understanding learners

(1) Modalities. The senses also play a role in ways people prefer to learn. Three senses in particular: seeing, hearing, and touch stimulate different portions of the brain and are most aligned to intentional learning. While learning does occur from smell and taste throughout our lives, those senses are not viable pathways within Marine Corps instructional systems. According to research, learners with visual (seeing) and tactile-fine motor movement/kinesthetic-gross motor movement (doing) preferences are the most prominent, while learners with auditory (hearing) preferences are the least. The MCISD/SATE process must account for these preferences and recognize that those who prefer auditory stimulus are the smallest population of learners.

[9] Essential Qualities of the Personality Patterns by Linda Berens http://www.bestfittype.com/Articles/essential_qualities_of_the_personality_patterns.cfm

It should be noted that creating curricula or using methods that favor one learner will tend to ignore the needs of another. This means that diverse approaches and methodologies should be used in order to reach all learners.

(2) Thinking. Another aspect of adult learners is thinking preference. Thinking is a result of brain dominance and personality; however, it is able to be shaped to match the environment. People tend to lean towards one approach to thinking within a context, but can be developed to stretch their thinking ability to achieve greater balance. Recognizing that adult learners have a tendency towards one type of thinking, teaching methodologies must foster more “balanced” thinking. This is done by leveraging strengths in the learning environment and stretching learners to develop areas of weakness.

(a) Analytical Thinking. Strengths in retention, critique of others, organizing information, and the process of problem solving; weaknesses in communicating with others, generating new ideas, dealing with uncertainty, seeing the big picture, and taking action.

(b) Creative Thinking. Strengths in generating new ideas and dealing with uncertainty; weaknesses in retention and organization of information, following processes for solving problems, seeing the big picture, communicating with others, and taking action.

(c) Practical Thinking. Strengths in communicating with others, seeing the big picture, and taking action; weaknesses in retention and organization of information, following processes for solving problems, generating new ideas, and dealing with uncertainty.

(3) Physiology. The human body physiologically can be primed for learning or can counteract learning. Hunger, fatigue, anger, fear, boredom, stress, and discomfort are all human factors that exist not only in the extreme trial of combat, but to varying degrees within Marine Corps learning settings. The deprivation of human needs generate these human factors, so they must be part of the preparation for war by exposing (inoculating) Marines for the realities expected. MCISD/SATE must intentionally assist learners to recognize these factors through designed, risk managed, guided, and supervised exposure, such as during field exercises or field firing exercises. At the same time, the learning process must seek to prevent the unintentional presence of these human factors within the learning setting as they gradually remove the learner’s ability to focus and reduce the impact and effectiveness of the learning experience. Appendix C highlights additional aspects of physiology impact adult learning.

4. Curriculum Design for Adult Learners. Driven by the demands of readiness, creating effective and efficient adult learning in the Marine Corps is fundamental to preparing for war. MCISD/SATE seeks to draw upon the most useful theories and concepts in order to make the most of the Instructional Systems Design (ISD) process. There are many models, theories, and personalities that have shaped adult education over a long period of time. To list and describe them here would be an exhaustive process. The intent is to highlight the characteristics of some practical models and theories to provide a basis for discussion and inform the participants during the instructional design process in preparation for curriculum development and instruction. Learning is about change. Developers, in particular, are charged with being able to translate the knowledge, skills, and principles of instruction into instructional materials, lessons, and activities. This

ultimately will bring about the change desired in Marines through training and education.

a. Elements of Learning. While there are many psychological perspectives that provide theories to describe the nature of human learning, the concept of training and education builds from a combination of the three main philosophical frameworks under which learning theories fall: behaviorism, cognitivism (or cognitive psychology), and constructivism (or social cognitive theory). Behaviorism focuses on the objectively observable aspects of learning. Cognitive theories look beyond behavior to explain brain-based learning. Constructivism views learning as a process in which the learner actively constructs or builds new ideas or concepts. While these main frameworks each provide a unique approach to describing the nature of learning, the integration of various aspects of each should be considered within the MCISD/SATE process.

b. Domains of Learning in a Marine Context. Learning can be thought of in an organized way, relating categories of increasingly difficult mental associations with observable behaviors across three overlapping domains: knowledge (or mental/intellectual learning), skills (or physical learning), and attitudes (or moral/values learning) – also known as KSAs. The difficulty of learning increases as the level increases. Higher order learning is achievable as the behavior to change is elevated up any of the three domains. A level of any domain may be the overarching goal of a learning activity, while the behaviors associated with the level of the domain serve as the means to reach and measure the goal within the context. For example, in a learning activity intended to enable Marines to comprehend the combat order format, the associated behaviors of “list” or “describe” the combat order format provides the means to both assess effectiveness and ensure transfer to the learner in reaching the overall goal. Figure 3-3 illustrates levels of particular behaviors associated with each domain as described below.

(1) Knowledge. The levels from simple to complex are knowledge, comprehension, application, analysis, synthesis, and then evaluation. A Marine operating at the knowledge level simply must recall facts or identify information, while a Marine operating at the evaluation level is comparing, considering, and deciding.

(2) Skills. The levels from simple to complex are perception, set, guided response, mechanism, complex overt response, adaptation, and then origination. A Marine operating at the perception level must distinguish or choose between sensory cues to guide a physical activity, while a Marine operating at the adaptation level modifies existing motor skills to fit a new situation.

(3) Attitudes. The levels from simple to complex are receiving, responding, valuing, organizing, and then characterization by value or value set. A Marine operating at the receiving level must listen for and accept ideas or direction, while a Marine operating at the valuing level supports, debates, and develops in others certain ideas, materials, or phenomena.

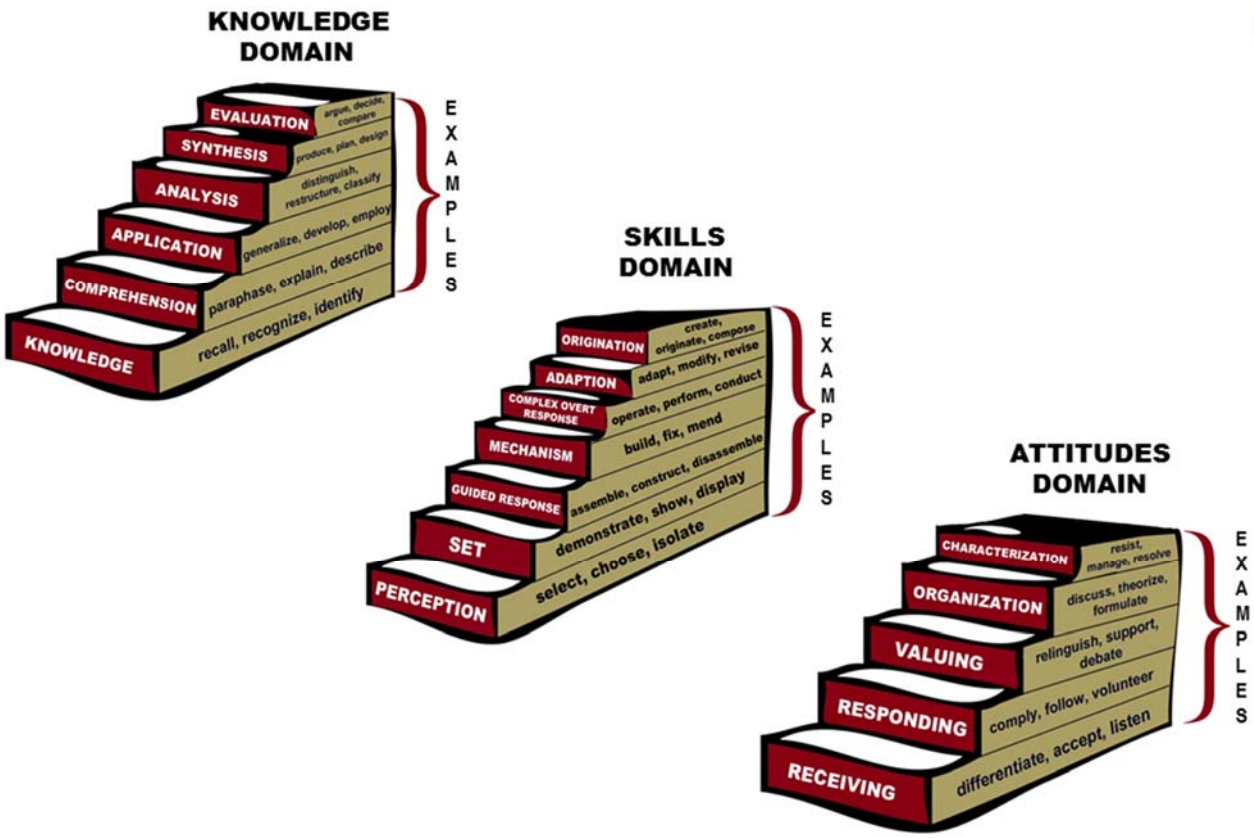

Figure 3-3.--Domains of Learning in a Marine Context

c. Learning Framework

(1) Experiential Learning Cycle. Experiential learning is a holistic theory made up of four stages that combines experience, perception, cognition and behavior.[10] Trainers and educators should view experiential learning theory as a cyclical process. This cycle could potentially occur every day in our lives, many times a day.[11] What this means to the instructor or developer is that in order to make the most meaning out of learning, there has to be time to learn and experience concepts and also reflect upon the concepts learned.

[10] Kolb, D. A. 1981. Learning Style Inventory: Self-Scoring Inventory and Interpretation Booklet. Boston, MA: McBer & Company.

[11] Clawson, J. G., & Haskins, M. E. (2006). Adult learning theory: It matters. In *Teaching management: A field guide for professors, consultants, and corporate trainers* (pp. 34-48). Cambridge: Cambridge University Press.

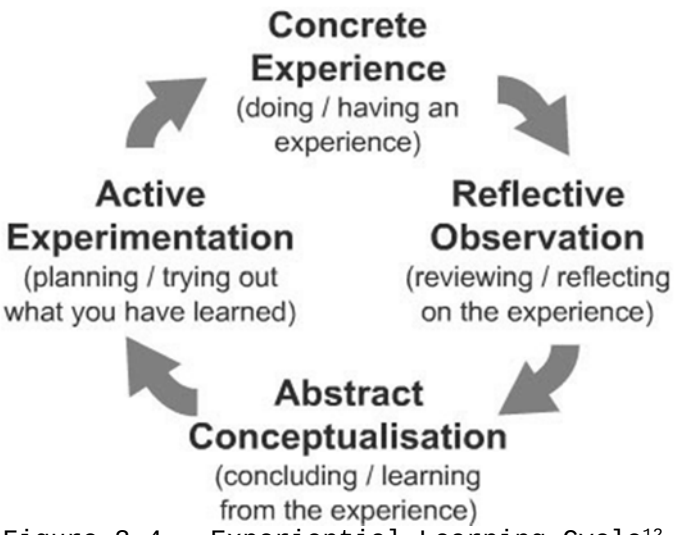

Figure 3-4.--Experiential Learning Cycle[12]

(2) Active Learning

"A learner really hasn't stored new information in long term memory until he or she does something with that information."[13]

(a) Think about past experiences as a learner or teacher. Often discussed is the difference in hearing a lecture and learning from a lecture. Is the learner actually mindfully processing what is being said? Or is he/she mindlessly occupying a seat in the classroom? Active learning can help eliminate the illusion of understanding.[14] Simply put, active learning is generally described as any instructional method that engages students in the learning process.[15]

(b) The core elements of active learning can be whittled down to introducing student activity into the lesson, and promoting student engagement. Goals of active training methods are to: (1) promote participation, (2) enliven learning, (3) increase retention, and (4) encourage application. Fully integrating active learning into any training program or course must begin in the developmental stages. Eight qualities of an active training design are listed in Appendix C.

(c) Research has proven that learners tend to learn more when the learning is active. This can work to maximize retention and design and deliver instruction that allows learners to actively participate in the learning process (group discussions, case studies, modeling). This does not suggest that lectures are not an effective teaching method; lectures can be active when the academic faculty, appropriately moderates time devoted to lecture (e.g. 10 minute mini-lectures) while employing various techniques

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[12] McLeod, S. A. (2010). Kolb - Learning Styles. Retrieved from http://www.simplypsychology.org/learning-kolb.html

[13] McKeachie, W. J., & Svinicki, M. D. (2014). *Mckeachie's teaching tips: Strategies, research, and theory for college and university teachers, fourteenth edition.* Belmont, CA: Wadsworth.

[14] Ibid, McKeachie

[15] Prince, M.(2004). Does active learning work? a review of the research. *Journal of Engineering Education*, 93(3), 223-231.

and/or technologies to engage the class. Utilizing the goals set forth and additional qualities listed in Appendix C for active training can provide amplifying guidance for academic faculty in their training design.

(3) Transformation through learning

"The mind is not a vessel that needs filling, but wood that needs igniting,"

– Plutarch

(a) The learning process is a continuum, in which Marines progress over time, from entry level training to the upper levels of PME. The inclusion of outcomes into the training development system allows for these changes to occur over time. This is where transformation comes into play. Transformation, in the Marine, occurs as they are taken through various levels of learning in the formal schools, and their operating units. Transformation does not happen all at once, but instead, over time. It is through this time, that true growth and change in learning occurs.

(b) Transformative learning allows students to learn in a manner in which they ingest the knowledge, are able to analyze it compared to their learned or prior experience, and then be able to discern a better decision. The goal of any curriculum is not for the student to merely be a sounding board or hear what is being presented. The goal is to provide the fleet with highly developed individuals who are able to take what they have learned, with a new perspective and be able to implement that into their jobs. The desired end-state is a well-rounded, accurately trained, and critically thinking Marine.

(c) Transformation is not just reserved for the civilian entering boot camp, to be transformed into a Marine. Transformation, the change of mindset, and gaining of a new ethos, must be sustained throughout that Marine's career. Transformative learning pays dividends in Values Based Training/Leadership (VBT/L), where leaders are translating values from paper into the hearts and minds of Marines. For more on transformation through learning, see Appendix C.

d. Transfer of Learning

(1) Planning the Learning Experience. Transfer of learning provides the learner with KSAs that can then be used to improve mission-related skills across the Marine Corps. Near transfer is taking a knowledge or skill, learned in one context, and applying it in a similar context (i.e. learning to drive a four speed manual in one type of vehicle and then driving a four speed manual in a different type of vehicle). Far transfer is the application of learning to a more "remote" or different context (i.e. applying the understanding of how shifting gears on a bike applies to shifting gears in a car - same basic principles of gears meshing or gear ratios). This is a variable that impacts time considerations, variety of near or far type problems for the learners to solve in the instructional system, and requires clearly defined learning structures to support evaluation of intended learning.

(2) Mapping the Learning Experience. Using learning structures for behaviors (T&R Events/Learning Objectives) in concert with those for mental associations (Learning Outcomes/Educational Objectives) should be similar to the structure of an operations order, which includes the mission/task to be

accomplished and the broader commander's intent. Additionally, academic faculty should seek to provide adult learners with enough repetitions, for content to be learned through application of instructional methods. While not applicable to every learning situation, Figure 3-5 below illustrates an approach to gaining repetitions that slowly shifts responsibility from the instructor to the student throughout a specific learning experience.

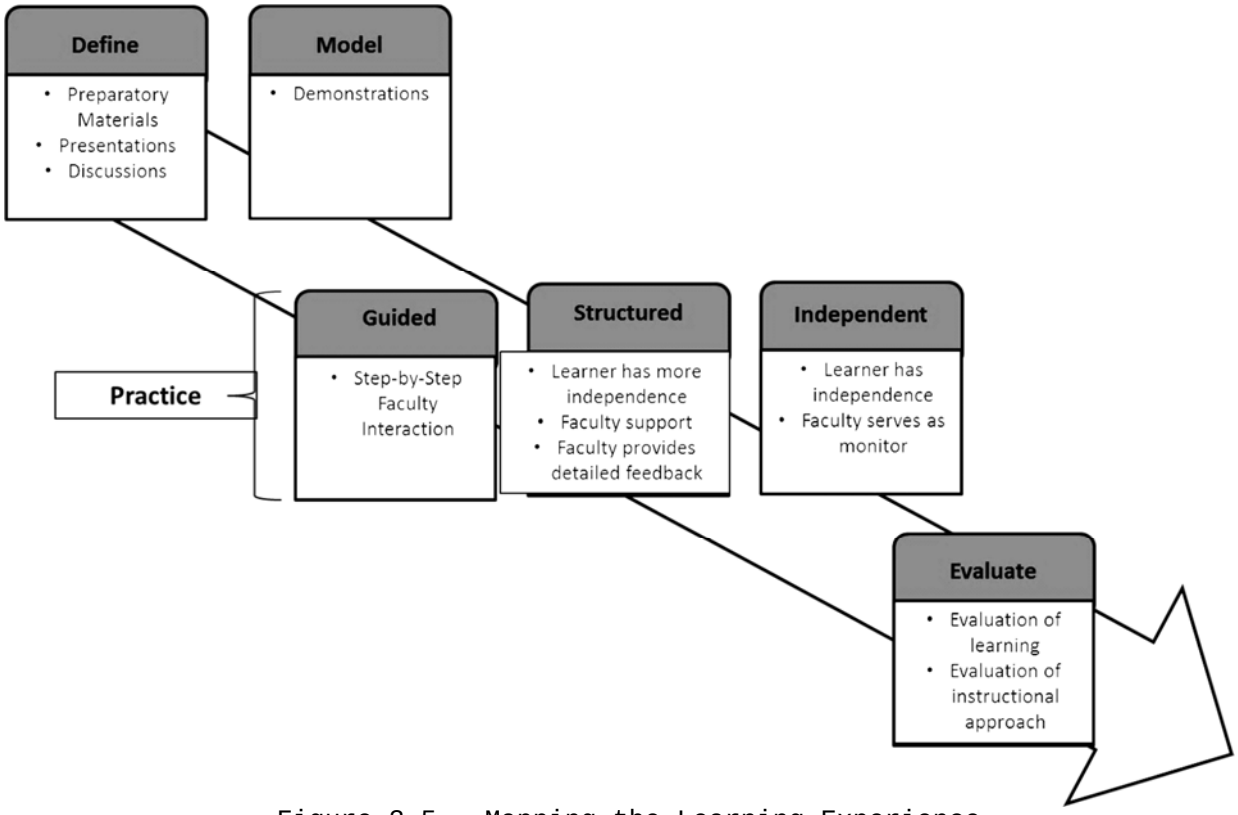

Figure 3-5.--Mapping the Learning Experience

(3) Connecting the Learning Experience. Transfer of learning to the job is best supported when learning makes multiple connections with previous experiences and when it goes beyond single mastery to frequent application of any KSA. Research shows that a minimum of seven repetitions is recommended as a sound basis to support the transfer of learning, but any KSA can be hard wired into automaticity through over fifty repetitions. This hard wiring is often described in physical terms specifically related to the skills learning domain as "muscle memory." While the muscles themselves do not remember, the pathways that repetition builds in the brain are what produce the lasting change in behavior. For example, Marines who first receive lessons on marksmanship, proceed to snap-in, and then live fire on the rifle range multiple times are returning to the KSAs for marksmanship repeatedly over several days during differing conditions of weather, wind, and other elements. This repetition first builds, then clarifies, and eventually makes automatic the firing positions and marksmanship fundamentals essential to speed and accuracy on the battlefield. We now see that Marines not only need to be actively engaged in learning to support retention, but they also need to apply any KSA frequently — going beyond simple mastery of "one and done" — leading up to building expeditionary readiness.

(4) Applying the Learning Experience. There is more than one way to frame a lesson and it is important to realize that there are steps that a learner must encounter to allow for learning. Saying "Lecture, Demo, Practical Application" is easy, but to truly train and educate with a goal of learning retention is more of an in-depth process. In general terms, any lesson should include general components that are applicable across methods and learning settings. These components frame up on the acronym LEARN: Link, Engage, Activity, Reflection, and Next Steps. There are other more technical approaches to designing a lesson that may be useful for MCISD/SATE, as identified in the Design phase of this handbook and in Appendix C.

5. Teaching Marines

"There are two parts to any mission: the task to be accomplished and the reason or intent behind it. The intent is thus a part of every mission. The task describes the action to be taken while the intent describes the purpose of the action."[16]

a. Integrating the Art and Science of Teaching. As noted in Chapter 1, Intentional learning is comprised of an inseparable combination of both training and education that together builds individual Marine and unit expeditionary readiness. This concept is applied throughout the MCISD/SATE process through learning structures focused on behaviors and mental associations as well as professional and adaptable faculty.

b. Learning Preferences

(1) Role of Faculty. Academic faculty need to recognize that there may be types of learners that match up well with certain types of teaching, and instructors. This takes thought and creativity, but the effort will help to make instruction effective for all students. It is also helpful for staff and faculty to take a Learning Style Inventory (LSI) 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. Instructors will tend to want to teach and curriculum developers will tend to design the way they want to learn. Each must be aware of their own tendencies, in order to ensure differentiated instruction and/or design to meet the needs of all learners. There are instruments to assist in determining these tendencies. See Appendix C for amplifying information.

(2) Role of Students. Similarly, students knowing their learning preferences can take advantage of their strength within a learning environment. Just as personality tests can look into personality, there are inventories that assist in determining learner types (see Appendix C). Regardless of the instrument, a series of questions is usually given to gauge student preferences, which can be used by developers and instructors to know how to better reach their students. It may not be practical in all situations to evaluate every student that enters a course; however, noticing trends, or changes in trends of the TPD, can assist the academic faculty in adjusting the course, as the TPD changes over time.

[16] MCDP-1, Page 89

c. Self-Directed Learners. As shown in Figure 3-6, there are multiple stages that learners go through in their learning progression. This chart also demonstrates the role of academic faculty, depending on the learner's stage. For example, flight students out for their initial flight are dependent upon the instructor for direction. They are looking for the instructor to be a coach and would warrant immediate feedback. Conversely, Officers at Command and Staff College are involved in their learning, which enables them to bring relevant experience and ideas to the discussion. In this case, the instructor spends most of the time as a facilitator. Understanding the four, stages of self-direction are important because it describes a flow of partnering a teacher or teaching style to how a student is best going to learn based upon their current stage. In contrast, it is possible to mismatch the staged learner with inappropriate instruction. For example, the Stage 4 learner is not going to learn best from a straight lecture or rote memorization method of teaching. Understanding styles of the learner is only part of the process. Being able to translate learning effectively is important as well. For further discussion of how the Four Stages of Self-Directed learners can apply to faculty, and students, see Appendix C. Noting stages that learners are in is important because assumptions can be made that learners should be in one position or stage, when in fact they are at another. In addition to this, learners continue to move both forward and backward between stages and positions and can be in more than one stage at a time. This changes on the subject being taught, or as expertise is gained. If an incorrect assumption is made, and a mismatch occurs, it could hinder their learning experience. For an additional look at stages of learning, see Appendix C.

SELF-DIRECTED LEARNERS			
Stage	**Student**	**Teacher**	**Examples**
Stage 1 Dualism	Dependent	Authority, Coach	Coaching with immediate feedback. Drill. Informational lecture. Overcoming deficiencies and resistance
Stage 2 Multiplicity	Interested	Motivator, Guide	Inspiring lecture plus guided discussion. Goal-setting and learning strategies.
Stage 3 Relativity	Involved	Facilitator	Discussion facilitated by teacher who participates as equal. Seminar. Group projects.
Stage 4 Commitment	Self-Directed	Consultant, Delegator	Internship, dissertation individual work or self-directed study group.

Figure 3-6.--Self-Directed Learners[17]

d. Information Processing. The senses send information to the brain, where it awaits processing. Memory plays a key role in learning, to distribute information and ultimately decide whether it will stay in short-term, working, or long-term memory. It is the primary system for receiving, processing, storing, and retrieving KSAs (see Figure 3-7). The age of information has led the learner to believe their brain can multi-task and focus on many objects at once. The truth is that the brain has a lot of

[17] Grow, Gerald O. (1996). "Teaching Learners to be Self-Directed." *Adult Education Quarterly, 41* (3), 125-149.

information to organize via the senses. It has to sort through this and pay attention to select items to gain meaning from them. This is why it is crucial for an instructor to engage learners by gaining and sustaining their attention. Academic faculty have to understand how information is processed and stored in order to use methodologies that will garner skills and knowledge into appropriate areas of the learners' memory. Academic faculty are best able to support Marines' learning when they help them attend to the information, organize and support new information structures through the bottleneck of temporary working memory, and build automaticity through repetition in the long-term memory.

(1) Temporary Working Memory. In a library, there is space for books, placed on book shelves. Imagine an enormous library with unlimited space; all with a surprisingly small in-processing desk to review, categorize, and code each book for addition to the library according to guiding frames or procedures. There is a process in place, in order to make sense of disorganization and store it properly. The learner's mind is very similar. Understanding the information process will help faculty be able to understand crucial moments during the process of learning to make the experience more effective.

(a) Sensory Register. The sensory register is likened to blinds on a window. As academic faculty, there is the need to set the stage for an instructional environment through design, development, the instructor's demeanor and classroom (all settings) management. We have to keep the students engaged and comfortable to keep the sensory register blinds open. If the blinds are closed, the student shuts out the instructor, the media, and the learning environment. Faculty need to keep this register (blinds) open in order to keep the learner engaged, to allow the cognitive processes to begin working and pass the knowledge, eventually to long-term memory. If the knowledge does not make it through this step, it has a small likelihood of being retained. The new information has to be able to continue being processed.

(b) Short-term Memory. Short-term memory functions as a temporary working memory. Think of short-term memory as a list of to-do items. The brain has priorities and new learning is at the tail end of the list. New learning takes being able to focus the learner's brain through attention, like using a flashlight in a dark room. The best way to do this is to actively engage the learner in multiple areas of the brain, so that the brain can prioritize what is relevant and prepare the learner for evaluation. For instance, the brain will prioritize things it deems important to survival or anything that involves emotion over new pieces of information to learn. Another example is for an instructor to ensure students take notes during a lesson. This results in learners doing something while also engaging the auditory, visual, and kinesthetic areas of the brain. It also ensures summarization by having the learner put concepts into their own words simultaneously. Instructors need to leverage survival where useful (this will keep you or your Marines alive). Secondly, instructors should leverage emotion priorities in the brain through a light sense of humor and helping students to remain engaged throughout the lesson. Attention must be gained, then sustained throughout the lesson.

(2) Working Memory. Working memory is like a work table where items are processed and organized. It holds information for a limited amount of time, but also retains a limited amount of information. This incorporates both new information that is moved to working memory and recalled

information. Recalled information is clarified, refined, and readied for return to long-term storage. Working memory needs information that is organized into structures. Just as more stacks of organized papers fit onto a table, than scattered loose sheets of paper. Faculty need to consider how many information structures they are levying and how often they are shifting those structures. Typically, the learner can only fit seven organized structures of information at a time and can attend to them for no more than twenty minutes at a time. This is why it is important that instruction should be well organized, and timely. Working memory is like a narrow in-processing desk - only capable of handling a few groupings of information at once. The guiding frames or procedures are mental models defined as “deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action. Entrenched mental models (or habits of mind)… thwart changes”, which may be necessary for learning to occur. Academic faculty must encourage openness to new ideas or ways of thinking about previously established norms in order for learning to meet minimal resistance when processed.

(3) Long-term Memory. Long-term memory is more like a filing cabinet. This stores information that is recalled by the learner, as necessary. Referencing Figure 3-7, information moves to long term through linking experiences. Long-term memory is divided into two areas: declarative memory and implicit memory. Declarative memory is related to knowing facts or events. Implicit memory is the knowing how to do things and is the process of tying together information occurs. Whether, implicit, or declarative, the important item to note is that stored information is recalled as needed, by similarities. This is where faculty can assist, by moving information to long-term storage by connecting new learning to prior learning and experiences. The long-term file on a topic will be stored, and recalled repeatedly over time in addition to several periods of sleep, much like a paper being revised over a period of time. This is what allows the clarification and refinement to fill out the conceptual file of information stored in the memory. Faculty need to consider how reinforcement and repetition will contribute to this storage during their courses. Instructors must leverage the learner’s prior experiences in order to support their learning by being able to store according to similarities. Also, repetition should be evident in design and instruction to ensure that the learners are able to clarify and solidify the information, skills, and attitudes. Repetitions should be spread across multiple days, allowing periods of sleep to allow the storage and recall process. This means that being able to get lessons on a topic spread over several days may increase the transfer of learning.

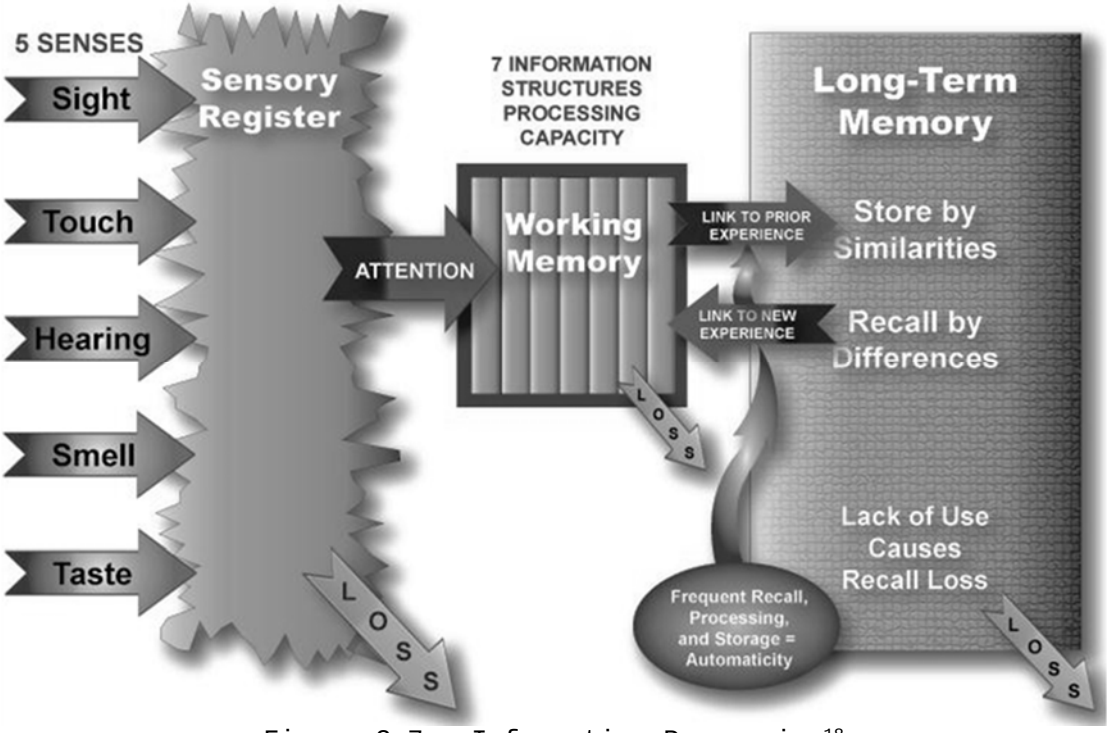

Figure 3-7.--Information Processing[18]

e. Social Learning. Teaching adult learners effectively takes leveraging social learning to guide participation of learners, tap into the dynamics of peer interaction, and apply a shared relationship with learners based on an apprenticeship model. Appendix C provides a model for apprenticeship. Social Learning is important because learners learn new information and behaviors best by observing other people, or modeling.[19] The steps in the modeling process and the apprenticeship model can lead academic faculty through methods to enhance learning. From the moment a person is born, they learn most often by example and what they see. The apprenticeship method takes advantage of this and provides ways that an instructor can guide a student through example, scaffolding and modeling to demonstrate the right way of doing things. As an example, this is why Drill Instructors go through a very selective screening process - only the finest Marines are chosen to be the initial examples that a civilian sees during their transformation into a Marine, thus providing a model for them to follow as a Marine.

f. Small Groups. Research on adult learning has shown that most adults learn best in small groups. This makes learners responsible not only for their own learning, but for the learning of the group. Learners 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 learners to hear and consider diverse perspectives and may require them to question their assumptions or hold opposing views prior to accepting or rejecting an alternative way of knowing. Small groups foster an environment where students that are confused are more likely to ask

[18] Sousa, D. (2001). *How the Brain Learns*. (2nd ed.). Thousand Oaks, CA: Corwin Press.
[19] Bandura, Albert (1997), *Self-efficacy: The exercise of control*, New York: Freeman, pp. 604

questions, check for understanding, and share their failure to grasp a concept with their peers than with a faculty member. Those students that do understand then have the benefit of reorganizing what they have learned and are able to explain it to those that are confused.[20]

g. Supportive and Challenging Environment. Academic faculty must provide and maintain a learning environment that assists learners in meeting goals, outcomes, and objectives. Facilitators of learning must become proficient in the use of constructive feedback and positive reinforcement. Academic faculty can remove or lessen anxieties by clearly describing expectations up front for participants and setting up group norms. An example is the facilitator letting participants know that active participation is encouraged, divergent opinions are welcomed, and that faculty members are there to help them learn. Why is this important? Understanding how a student thinks (what stage or position the student holds) allows academic faculty to tailor activities in the classroom to support the learner in growing and developing autonomy with the subject. Also, students may become stuck in their progression by "temporizing" (delaying in a position and hesitating to make the next step), "escaping" (avoiding responsibility of commitment), or "retreating" (returning to dualism as a means of dealing with overwhelming environmental challenges). Instructors should be aware of this, and do what is necessary to help the learner move forward.

6. Conclusion

"We must provide opportunities to experiment and work with the latest technological advances. In order to learn and improve, we will aggressively experiment, testing new concepts and capabilities, within existing training venues, and developing emerging venues where appropriate."

- Gen Neller, 37th Commandant of the Marine Corps

a. The nature of our organization is such that our population is comprised of adult learners. However, not all learners or learning environments are alike. When attempting to design, develop, or implement an instructional system for Marines, it is necessary to know more about Marines as learners and how they may learn.

b. Treating Marine learners as adult learners increases the cultivation of decision making concepts (adaptability, sense making, meta-cognition, attentional control, and problem solving). These are not ideas or skills that are transferable through informal lecture or other directive learning methodologies. These concepts, if they are to be effective, should be introduced to the learners early in their transformation from civilian to warfighter. This is accomplished by developing the learner using adult learning methodologies throughout the MCISD/SATE process. Creating a foundation at the entry-level allows the institution to continually and consistently develop higher order thinking skills throughout the learner's career. Career-level Marines will then bring a wider range of institutional knowledge and experience for facilitators to build upon. As such, more interactive methodologies may be required to satisfy the needs of a mature learner.

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[20] McKeachie, W. J., & Svinicki, M. D. (2014). *Mckeachie's teaching tips: Strategies, research, and theory for college and university teachers, fourteenth edition.* Belmont, CA: Wadsworth.

c. The aforementioned models and discussions on learning are just a broad brush stroke compared to what is available. Theories are updated in time, as well as the research and practices available. A commitment to lifelong learning by academic faculty will prove beneficial to the end product that the Marine learner receives. Personnel involved in the training and education of Marines can utilize the appendices in this handbook which provide more in-depth information on what is presented, relative to adult learning.

CHAPTER 4

ANALYZE PHASE

NOTE: For specific guidance on how MCU utilizes the instructional design model during the Analyze Phase, contact the office of the MCU Vice President of Academic Affairs.

1. Introduction. As noted in Chapter 1, MCISD/SATE is an instructional system comprised of inputs, internal processes, and outputs, which uses the construct of the ADDIE model to accomplish the overall desired goal for the Marine Corps Training and Education System. As part of the system, Figure 1-3 illustrates how evaluation occurs continuously throughout all phases of ADDIE to ensure a systematic and standardized approach is used when assessing the effectiveness and efficiency of an instructional program. Inputs to the Analyze Phase can come from various forms of data collection, such as MET reviews, doctrinal changes, new equipment fielding, manpower requirements, OccFld reorganization, etc. As the data is utilized during the Analyze Phase through a series of sub-processes (codified in subordinate paragraphs), the output is an update to the MOS Manual and the development of a T&R Manual. This provides not only the requirements, but also focus for Formal Schools to use when designing and developing their learning outcomes/objectives during the Design Phase. Figure 4-1 provides a graphic representation of the process flow within the Analyze Phase and its sub-processes.

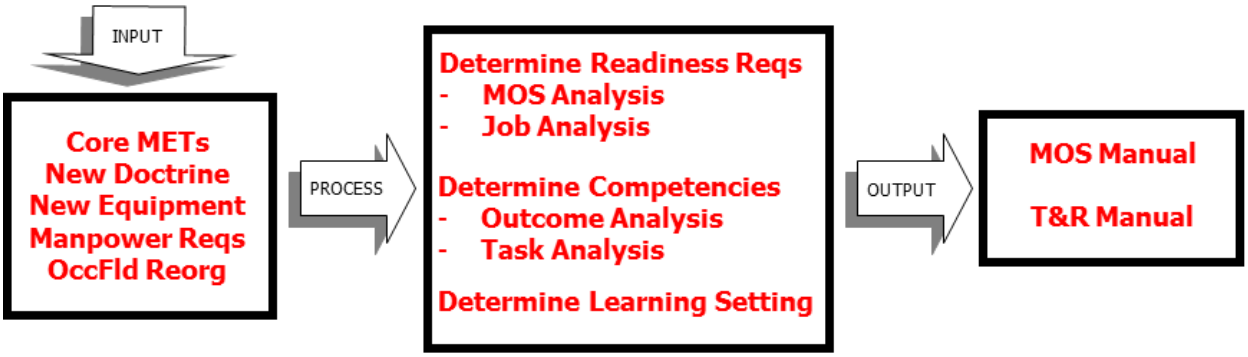

Figure 4-1.--Analyze Phase Flowchart

2. Determine Readiness Requirement. Core Mission Essential Tasks (MET) are the service-level requirements comprised of MOS Core Skills and Unit Core Capabilities, which are defined by collective and individual T&R events, per reference (m). Evaluation “E” Coded events are the training measures of effectiveness for these Core METs and are directly supported by MOS proficient individual Marines and Unit collective training requirements. As illustrated in Figure 4-2, the MCISD/SATE process utilizes these Core METs to define the requirements for each OccFld/Community, MOS, skill area, or capability. Determining individual training readiness requirements is initiated through two interrelated sub-processes: MOS Analysis and Job Analysis. Their purpose is to identify gaps in existing capabilities within current or anticipated behaviors or mental associations and to codify the information into a list of duties and tasks to be trained on the job or taught in Formal schools. For some rare new functional areas or MOS communities, they define for the first time the full operational capability (FOC) required rather than identify existing gaps. The results are codified in two source documents: MOS Manual and T&R Manual.

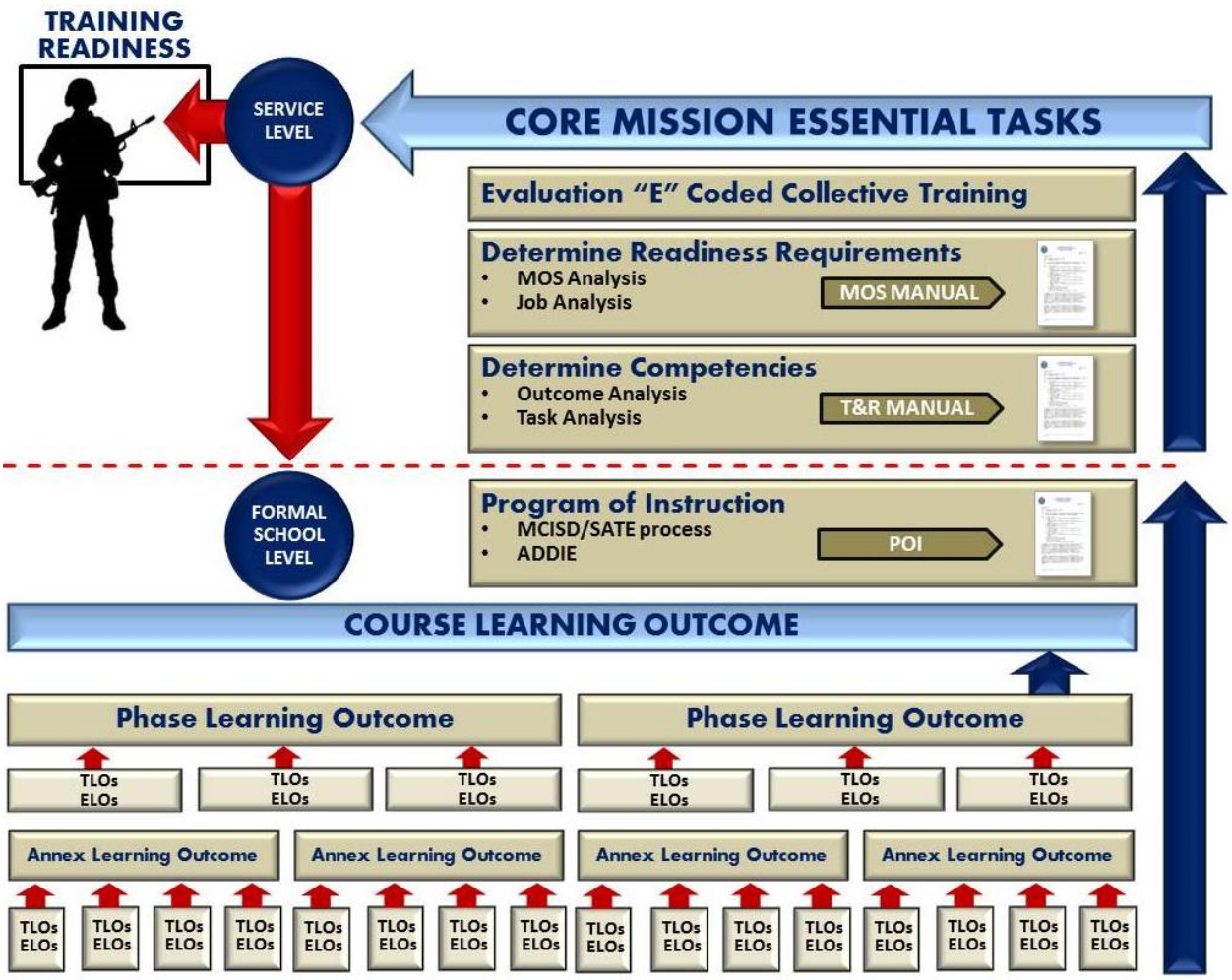

Figure 4-2.--Outcomes Based Training and Education

a. MOS Analysis. MOS Analysis is the process used to determine the intended state of readiness for Marines assigned to a specific MOS. Within this analysis, the focus of effort is to update the MOS Manual by providing a clear and concise focus (outcome statement) to define and organize MOSs to: 1) identify billet requirements on tables of organization in Total Force Structure Management System (TFSMS); 2) identify skills qualification of individual Marines in the Marine Corps Total Force System (MCTFS); and 3) identify required training for necessary MOS skills qualifications, per reference (n). At the broadest level, the Marine Attributes identified in Chapter 1 are an example of how all Marines should "be" and provide the foundation for the training and education continuum. These attributes should be leveraged in determining the service-level outcome statements that will support the Occupational System identified in the MOS Manual. To follow the sequential process, these statements will feed directly into determining competencies within the Outcome Analysis during a T&R Working Group. Figure 4-3 provides the service-level outcome criteria used to develop outcome statements. Figure 4-4 provides an example of how an outcome statement would appear in the MOS manual. An example for Formal Schools to use in the development of learning outcomes is provided in Chapter 5. NOTE: Use of the outcome statements will result in modifications to MCTIMS and will be communicated in subsequent versions of the MCISD/SATE and other TECOM orders and directives.

SERVICE-LEVEL OUTCOME CRITERIA
1. Builds upon the Marine Attributes to specify how an individual will “be” as it applies to his/her career path.
2. Builds upon the service-level Marine definitions.
3. Supports a logical progression of the MOS Roadmap.
4. Provides a means to measure mastery of skills that demonstrates positive progress over time.
5. Developed as a “long term” learning contract between an individual Marine and the Marine Corps.
6. Provides an aspirational goal for individual Marines to strive towards.
7. Clear and concise without ambiguity.

Figure 4-3.--Service-level Outcome Criteria

3110. OCCUPATIONAL FIELD 03, INFANTRY

2. MOS 0311, Rifleman (Sgt to Pvt) PMOS

a. Outcome. A Marine rifleman is a physically fit, mentally hardened and offensively minded warrior, skilled in the disciplined application of force and possessing the moral courage to make sound decisions and withstand the rigors of combat.

b. Summary. Riflemen employ the M16M4/A4 Service Rifle, the M203 Grenade Launcher and the M27 Infantry Automatic Rifle (IAR) and are the primary scouts, assault, and close combat forces available to the MAGTF. They are the foundation of the Marine Infantry Organization, and as such are the nucleus of the fire team in the rifle squad, the scout team in the LAR Squad, and Scout Snipers in the infantry battalion. NCOs are assigned as Fire Team Leaders, Scout Team Leaders, and Rifle Squad Leaders.

Figure 4-4.--MOS Manual Outcome Statement (Example)

b. Job Analysis. Per reference (l), the Front End Analysis (FEA) process highlights evolving changes across an OccFld by identifying and comparing common trends in what "on the job" tasks Marines actually perform with tasks learned at MOS school. Job Analysis occurs as part of this process and is the collection and organization of data that results in a clear description of duties, tasks, and behaviors that define that job. TECOM administers electronic surveys to job incumbents, conducts interviews with SMEs, observes actual job performance of tasks, and/or convenes a board of SMEs to review the currently approved task list. The result is a verified list of all tasks performed on the job and the identification of those tasks that must be taught in Formal Schools. Once the Job Analysis is complete, a FEA Report is produced that serves as a key input to the Task Analysis conducted at a T&R working group.

(1) Job Analysis requirements are typically generated by:

(a) Organizational changes (e.g. MOS structure, OccFld realignment).

(b) Introduction of new or better weapons/support systems.

(c) Doctrinal changes, DoD requirements, and Marine Corps needs.

(d) Evaluations/MCCLL reports indicating changes in job requirements.

(e) Direction from higher headquarters.

(2) Step 1: Initial Task List Development. The first step in Job Analysis is the development of an initial task list and is conducted by TECOM MAGTF Training and Education Standards Division (MTESD) in coordination with the OccFld Advocate. This process can include the initial identification of functional areas in which the tasks can be organized.

(a) Initial Task List. An initial task list is developed by a combination of the following means:

1. Reviewing technical documentation and references pertaining to the job. This documentation might also be obtained from various sources outside the Marine Corps and may address similar tasks or have generated materials that may be applicable for task list development. These sources include Navy, Army, Air Force, or Coast Guard Formal Schools, civilian or industry trade organization/associations or the Defense Technical Information Center, which offers training studies, analyses, evaluations, technical articles and publications.

2. Conducting formal collaboration with subject matter experts who can detail the requirements of a specific job.

3. Conducting interviews with SMEs.

4. Reviewing MCCLL reports to identify (environment, enemy, and conflict non-specific) changes to job and task requirements.

5. Soliciting input from Formal Schools.

(b) Task Criteria. A task is a behavior performed on the job and must meet the following criteria:

1. Be a logical and necessary unit of work.

2. Be observable and measurable.

3. Have one action verb and one object.

4. Be a specific act done for its own sake.

5. Be independent, unique, and able to stand on its own.

6. Have a specific beginning and ending.

7. Occur over a short period of time.

(c) Functional Areas. A functional area is an organizer of data consisting of one or more tasks performed. To facilitate the survey of incumbents and correlation of survey data, closely related events within a

task list are grouped by functional area. Functional areas are generally very broad categories and may be defined by:

1. A system (e.g. Weapons, Demolitions, Communications).

2. A function (e.g. Admin, Operations, Maintenance).

3. A responsibility (e.g. Train, Manage, Education).

(3) Step 2: Task List Verification. The next step 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. This information is collected, analyzed, and synthesized during the FEA process and integrated as part of the Job Analysis to provide invaluable input for the T&R working group.

(4) Step 3: Task List Refinement. 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 task criteria.

3. Determine Competencies. The individual readiness requirements produced from the previous analyses feed directly into the next element of the Analyze Phase - the T&R Working Group. This venue permits the process of determining competencies in the form of events and outcomes. During T&R event development, behaviors and mental associations are determined and sequenced to describe a Marines' performance in an OccFld, MOS, Grade, Billet, and/or Functional area. Similar to determining readiness requirements, competencies are also determined through two interrelated sub-processes: Outcome Analysis and Task Analysis. These sub-processes involve the systematic approach of identifying specific events to be developed and a detailed analysis of each of those events in terms of frequency, difficulty, and importance.

a. Outcome Analysis. During the Outcome Analysis, emphasis is placed on 1000/2000 level events and the outcome statements codified in the MOS Manual are either carried over (MOS producing, MOS skill progression/skill enhancement) or further developed (Entry level, Non-MOS specific skill enhancement) as noted below within the Individual Events chapters in the respective T&R Manual. These statements will be used to inform the Task Analysis in order to develop events that meet the outcomes derived during MOS Analysis. This will also align them to the appropriate OccFld/Community level in order to accurately support development for readiness. NOTE: Use of the outcome statements will result in modifications to MCTIMS and will be communicated in subsequent versions of the MCISD/SATE and other TECOM orders and directives.

(1) Entry level (Marine Corps Common Skills). The Marine definitions in Chapter 1 are identified as the service-level definitions for an individual Marine regardless of his/her MOS: Basic Marine, Marine Rifleman, and Marine Leader. These statements provide a foundation to build upon at each progression throughout the training and education continuum. They can also be used to develop the mission statements of the Formal Schools that teach Entry Level Training (ELT).

(2) MOS Producing. When developing the outcome statements for a particular MOS, the criteria identified in Figure 4-3 must be followed in order to standardize the means in which they are presented in the MOS Manual.

The statements will be codified within each Occupational Field under the MOS section and will be updated on an annual basis, per reference (n). Figure 4-5 provides an example of an outcome for an MOS producing course.

(3) MOS Skill Progression/Skill Enhancement. Regardless of whether or not a course is designated as ELT, MOS producing, skill progression, or skill enhancement, the outcome statement provides focus to Formal Schools during course design and development. It is the responsibility of every Formal School to ensure that learning outcomes support the outcome statements codified in the MOS Manual and T&R Manual respectively.

(4) Non-MOS specific skill enhancement. Figure 4-3 will be used during the development of learning outcomes for non-MOS specific skill enhancement in order to support the outcomes designated in the T&R Manual. Once developed, they will provide focus to Formal Schools when determining course learning outcomes and subordinate learning outcomes (Chapter 5) while enabling creativity and innovation during curriculum design and development. Figure 4-6 provides an example of an outcome for a non-MOS specific skill enhancement course.

INFANTRY T&R MANUAL

CHAPTER 11

MOS 0311 INDIVIDUAL EVENTS

11000. OUTCOME. A Marine rifleman is a physically fit, mentally hardened and offensively minded warrior, skilled in the disciplined application of force and possessing the moral courage to make sound decisions and withstand the rigors of combat.

11001. PURPOSE. This chapter details the individual events that pertain to the community. These events are linked to a service-level Mission Essential Tasks (MET). This linkage tailor’s individual training for the selected MET. Each individual event provides an event title, along with the conditions events will be performed under, and the standard to which the event must be performed to be successful.

Figure 4-5.--MOS Producing Outcome Statement (Example)

T3 T&R MANUAL

CHAPTER 3

FORMAL SCHOOL INSTRUCTION INDIVIDUAL EVENTS

3000. OUTCOME. Ethical, Adaptive, Teacher-Scholar able to facilitate the development of life-long, self-directed learners.

3001. PURPOSE. This chapter details the individual events that pertain to formal school instruction. Each individual event provides an event title, along with the conditions events will be performed under, and the standard to which the event must be performed to be successful.

Figure 4-6.-- Non-MOS Specific Skill Enhancement Outcome Statement (Example)

b. Task Analysis. Task Analysis can be behaviorally oriented in the form of T&R events - what can be seen whether evaluated objectively or subjectively - and are framed using behaviors, conditions, and standards, as well as associated event components or performance steps. During this process, the members review formative and summative data derived from student critiques, FEA reports, MCCLL reports, CCRB ROPs, etc. in order to determine the job performance requirements necessary for each task performed on the job. Within Task Analysis, draft behavior statements are focused on what must be observed in the form of tangible and intangible verbs connected to a subject/object. Figure 4-7 provides the purpose of a task analysis.

PURPOSE OF A TASK ANALYSIS
1. Refine the task list based on SME input.
2. Develop T&R events that appropriately codify the requirement.
3. Produce a TPD that will guide the Formal School or unit in the preparation and facilitation of instruction.
4. Analyze other OccFld T&R manuals to determine similar T&R events IOT mitigate duplications across communities.

Figure 4-7.--Purpose of a Task Analysis

(1) T&R Event Development

(a) Building block approach. T&R events are the building blocks of the T&R Program and are developed by SMEs from the OPFOR, supporting establishment, and other stakeholders. This system of progressive and ordered events minimizes duplications, ensures training effectiveness, and reduces the number of tasks commanders at all levels are required to track. All T&R events relate directly back to the unit’s METL and serve as the foundation for curriculum design and development in subsequent ADDIE phases. The output is a draft T&R Manual that is formally staffed to key stakeholders and eventually authorized by the appropriate CG as the approved community training standards. Refer to reference (m) for amplifying information.

(b) Simulations (Live, Virtual, Constructive). References (a) and (f) codify the requirement to plan accordingly for live, virtual, and constructive training across the MAGTF. The Commandant directs the operational and training and education communities to focus on better leveraging modern immersive training and simulation technologies. Per reference (b), instructors shall work closely with curriculum developers to ensure that POIs and associated MLFs utilize simulations, where appropriate.

“We will work to leverage a virtual and constructive training environment and tools to train our major subordinate command (MSC) and major subordinate element (MSE) headquarters (HQ), focusing on our leaders. Enabled by technology, we will increase the amount of training each unit can accomplish - to “increase the reps” in mentally and physically stressing environments for all elements of the MAGTF before they do so on the battlefield.”

- Gen Neller, 37th Commandant of the Marine Corps

(2) T&R Event Composition. Each T&R Event has specific components that make up the actual event. Although the majority of these components are

necessary fields, some of them are specific to either Individual Training Events (ITE) or Collective Training Events (CTE) depending on how they are developed. Amplifying information can be found in reference (m).

4. Determine Learning Setting. The third process in the Analyze Phase involves determining the learning setting for each ITE behavior. Similar to Task Analysis, this process also occurs during a T&R Working Group and defines which instructional level is responsible for facilitating the instruction and the level of proficiency the student must achieve when performing the task in a learning environment. When determining the learning setting, two guiding factors must be used: effectiveness and efficiency. For example, one function of entry-level instruction is to teach the necessary skills to prepare a Marine immediately upon arrival at his/her first duty station and to provide the Marine with the necessary prerequisites to continue instruction in a Managed On-The-Job Training (MOJT) program. During T&R event development, the structure can be broken down into organizations that will assume responsibility for fulfilling the requirement. The events must be divided into the following groups, which are components of the drop down menu in MCTIMS:

a. Formal School: 1000 level, 2000 level which includes skill progression and skill enhancement.

b. Managed On-The-Job Training: 2000 level; or 3000 through 9000 for CTEs.

c. Distance learning: Computer-based instruction.

CHAPTER 5

DESIGN PHASE

NOTE: For specific guidance on how MCU utilizes the instructional design model during the Design Phase, contact the office of the MCU Vice President of Academic Affairs.

1. Introduction. The output of the Analyze Phase, the T&R Manual, becomes the input to the Design Phase. During the Design Phase, the curriculum developer takes the T&R events designated to be taught at the Formal School and attempts to simulate, as closely as possible, the real world job conditions within the learning 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. Figure 5-1 illustrates the inputs and outputs of the Design Phase.

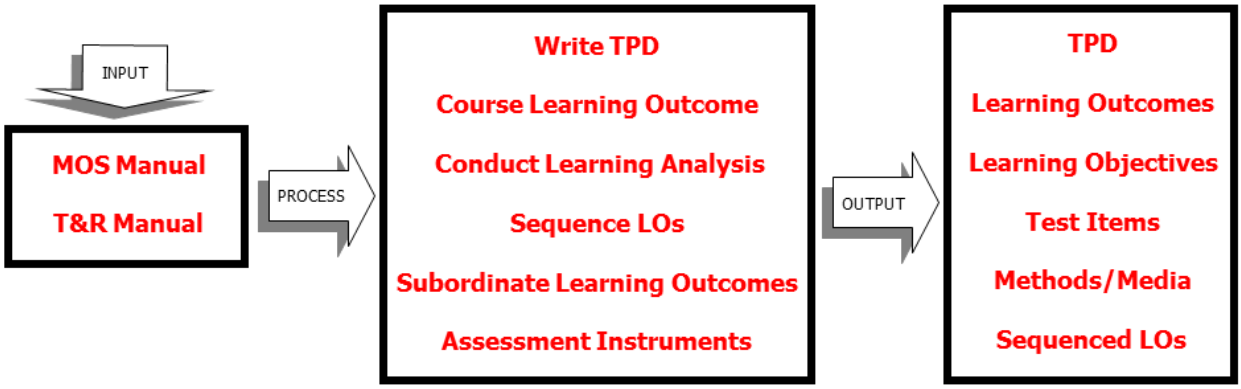

Figure 5-1.--Design Phase Flowchart

2. Write a Target Population Description (TPD). A TPD is a description of the 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 each student 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.

a. 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. 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 re-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 instructional methods, media, and evaluation methods. For example, experienced students can often learn with group projects or case studies and self-evaluation. ELT 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.

b. Steps to Write a TPD

(1) Obtain Sources of Data. To clearly define the TPD, data must be gathered from the appropriate sources listed below. Information can be obtained from the OccFld Advocate and TECOM TAs by means of phone conversation and/or electronic message. The outputs from the Analyze Phase (MOS Manual and T&R Manual) outline job performance by detailing what tasks must be performed on the job and the specific requirements of that particular job.

(2) Gather and Review Student Background Information. To ensure the course prerequisites are correct and that the POI is developed appropriately for the TPD, information can be organized into the following categories:

(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, and others.

(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, evaluation scores, training experience and GCT/ASVAB scores.

(3) Generate a Draft TPD. Capture information that describes the general characteristics of the average student attending the course. Organize this information so that it is grouped together and any prerequisites are grouped together. Summarize the data into a concise paragraph describing the target population. Figure 5-2 provides an example of a TPD.

TARGET POPULATION DESCRIPTION (EXAMPLE)
This course is designed for those Marines, both Officer and Enlisted, as well as civilian and contracted employees, involved in the design, development and evaluation process of the MCISD/SATE. Attendees must possess a working Common Access Card (CAC) and be proficient in Microsoft Word and PowerPoint. Prerequisites: 1. Students must possess a CAC with current certificates. 2. Assignment as a curriculum developer or administrator at a Marine Corps Formal Schools/Detachments. 3. Proficient in Microsoft Word. 4. Proficient in Microsoft PowerPoint.

Figure 5-2.--Target Population Description (Example)

3. Determine Course Learning Outcome. The service-level outcome statements codified in the T&R Manual provide a clear and concise focus for Formal

Schools to use in the development of course learning outcomes. Each learning outcome should include a measurable change as a result of objective and subjective evaluation of designated learning objectives. Outcomes are not typically assessed just by observing a learner during a moment in time, but rather over time through observable events (e.g. field exercises, job performance, liberty choices). In doing this, course learning outcomes will be linked directly to the service-level outcomes in order to support the building block approach and ultimately align with the Core METs. NOTE: When designing curriculum, the curriculum developer may use various resources, such as input from outcome statements at the service-level, analysis of the school mission statement, and/or commander's guidance. The process for developing subordinate learning outcomes (e.g. phase, annex) and the use of assessment instruments will be discussed later in the chapter. Figure 5-3 provides an example of what a course learning outcome would look like in the CDD portion of a POI, when implemented.

SECTION I – COURSE DESCRIPTIVE DATA

1. COURSE TITLE: Infantry Rifleman Course

2. LOCATION: Commanding Officer
School of Infantry
Training Command
PSC Box 20161
Camp Lejeune, North Carolina 28542-0161

3. COURSE ID: M030314

4. OTHER SERVICE COURSE NUMBER: N/A

5. MILITARY ARTICLES AND SERVICE LIST NUMBER (MASL): N/A

6. OUTCOME: A Marine rifleman is a physically fit, mentally hardened and offensively minded warrior, skilled in the disciplined application of force and possessing the moral courage to make sound decisions and withstand the rigors of combat.

7. SCOPE: This course is designed to train Marines in the knowledge and skills required to perform as a rifleman in an infantry rifle squad. The Marine receives instruction on the M27 Infantry Automatic Rifle (IAR), offensive operations, fire and movement, patrolling, urban patrolling, urban fighting positions, traffic control points, room clearing, and reporting information. Additionally, this course reinforces the skills mastered in the 0300 Program of Instruction through scenario-based training that simulates what the Marine will be required to perform in the operating forces. Upon successful completion of this course, a Marine will receive the MOS 0311 and be capable of performing as a rifleman in an infantry rifle squad.

Figure 5-3.--Course learning outcome (Example)

4. Conduct a Learning Analysis. The purpose of a learning analysis is to examine the real world behavior that the Marine performs in the OPFOR and transform it into the learning setting. A learning analysis must be performed for every T&R event taught at a Formal School and must be validated with every POI submission. As noted in Chapter 2, outcomes specify how the

learners will “be” as a result of the learning experience, but are not a “one size fits all” solution. The learning analysis allows for adjustments to be made to accommodate for resource constraints at the Formal School. During this process the following products are produced: Learning Objectives, Test Items, and Methods/Media.

a. Steps to Conduct a Learning Analysis

(1) Step 1: Gather Materials. Once the scope of a course being designed by the curriculum developer is determined, obtain the:

(a) T&R Manual. To determine what events the jobholder performs. Also used to identify if any T&R events were linked to service-level outcome statements.

(b) Publications. Orders, directives, manuals, job aids, etc. will help analyze the events to be taught.

(c) Subject Matter Experts. To fill in details that the publications do not cover. SMEs will conduct the brainstorming session along with the curriculum developer.

(d) Learning Analysis Worksheet (LAW). Utilize MCTIMS CMD to enter data into the LAW. LAWs must be included as a component of the MLF.

(e) Learning Objective Worksheet (LOW). Utilize MCTIMS CMD to enter data into the LOW. LOWs must be included as a component of the MLF.

(f) Previously developed LAWs and LOWs. If a course is similar or has tasks related to the one being developed, then reference can be made to the LAWs and LOWs.

(2) Step 2: Determine Formal School Requirements. Review the T&R Manual to determine what tasks must be taught at the Formal School. In a T&R Manual, all tasks taught at the Formal School for 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 at the 2000-level. In some cases, topics that need to be taught at a Formal School will not have corresponding events in a T&R Manual. Examples are a course overview or an introduction to a series of tasks being instructed. These lessons are not derived from learning objectives and are designated “Lesson Purpose.” Amplifying information on lesson purpose can be found in Chapter 6.

(3) Step 3: Analyze the TPD. Before the knowledge, skills, and attitudes (KSA) 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 learning 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.

(4) Step 4: Record Event Data. Record the data found in the individual elements of the T&R manual. Then record each performance step.

(5) Step 5: Generate KSAs. When generating KSAs, 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 differences between KSAs are identified below.

(a) Knowledge. Information required to develop the skills for effective accomplishment of the jobs, duties, and tasks. 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 an NSN”.

(b) Skills. 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”.

(c) Attitude. An acquired mental state that influences choices for personal action, such as preferences, avoidance, or commitment. Since the majority of these cannot be observed or measured within the confines of the learning setting, they may still be recorded during the learning analysis.

(d) Brainstorming. This is the method used by SMEs and curriculum developers to ensure that KSAs are generated for each task. 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.

1. The phrases “Know” and “Know how to” (KHT) indicating a knowledge and “Be able to” (BAT) indicating a skill are common terms in the learning analysis brainstorming process.

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

(6) Step 6: Group KSAs

(a) Review all the knowledge and skills generated for the entire event, regardless of the performance step under which they were initially brainstormed. Circle those that are duplicative, very similar, or common to one or more performance steps. Identify those that you feel belong together by color-coding or using symbols. It is recommended not to use letters due to the potential of causing confusion later in the process. Complementary knowledge and skills are grouped to create the appropriate number of ELOs. NOTE: *It is important to “hide” the performance step during the grouping process in order for an unbiased grouping of KSAs.*

(b) 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 are determined to be possessed by the TPD prior to the period of instruction, they would be designated as “TPD.” Additionally, if a grouped KSA is taught in an earlier portion of the course, then it would not need to be re-taught but merely recalled. These

grouped KSAs will be designated 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 event. 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. If a KSA is omitted at this point, it will not be included in a learning objective, test item or lesson plan. Ensure references are used to help capture all KSAs. A good practice is to record the reference, page, and paragraph along with the KSA for use during the Develop Phase. For all KSAs that are not TPD or DEL, group them together (perhaps by similar object or verb), so that they can be taught together. You may have more or less groups than performance steps, depending on the specificity of the T&R event and performance steps.

(c) Develop Draft Behavior Statements. For each group, answer the question: “What behavior would confirm that the student possesses these skills and knowledge?” It is possible for the draft behavior statement to be the same as the performance step. These will later be used to write a learning objective.

(d) KSAs are grouped to determine which should be taught together, thereby improving the effectiveness and efficiency of a lesson. These statements will be used to develop learning objectives.

(e) Record behaviors and retain since these behaviors are the basis for developing the ELOs. NOTE: *The number of performance steps does not necessarily equate to the number of ELOs.*

(7) Step 7: Sequence Groups. Review the draft behavior statement for each individual event and all the groupings of KSAs. The question to be answered during this step is, “Which grouping(s) of KSAs 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 the methods listed below to sequence the groups. 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. Record the method of sequencing on any of the notes lines for the grouping of KSAs

(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. Actions are sequenced to demonstrate cause and effect 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. 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.”

(i) Known-to-Unknown. 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.

(8) Step 8: Input KSAs into MCTIMS. For documentation of the Learning Analysis process, all elements must be recorded into MCTIMS. A LAW must be produced for inclusion in the MLF.

(a) LAW report generated by *task*. Allows you to see a LAW report by performance step and allows verification that KSAs were developed for each performance step.

(b) LAW report generated by *group*. Allows you to see the KSAs that were generated for the performance steps separated by groupings. This will give you the information required to be placed under each main idea in your Lesson Plan. This report shows the linkage between the T&R event, POI and lesson materials. The LAW, by group, determines the number of ELOs as well as each ELO draft behavior statement. Draft behavior statements will be recorded next to the alpha designator for that grouping of KSAs. Additionally, each group determines the content (KSAs) that will be covered under every ELO.

c. Develop Learning Objectives. A learning objective is defined as 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. In layman’s terms, learning objectives are a “contract” between the student and the standard. ITEs that are included in a formal course of instruction will have corresponding learning objectives unless exempted by the specialized cases identified in reference (b).

(1) Purpose. The purpose of a learning objective can be broken down into five areas – all with equal importance.

(a) States behavior students will be able to perform. (Behavior)

(b) Describes the conditions under which the performance will occur. (Condition)

(c) Tells how well someone will perform. (Standard)

(d) Establishes the basis for measurement of the performance.

(e) Provides a focus for the instructor and the student.

(2) Types of Learning Objectives. There are two primary types of learning objectives: Terminal Learning Objectives (TLO) and Enabling Learning Objectives (ELO). PME uses student learning objectives.

(a) TLO. Describes the behavior a student is expected to perform upon completion of a lesson, topic, major portion of a course, or course completion.

(b) ELO. Describes the behavior for prerequisite knowledge and skills necessary for a student to perform the steps identified in the T&R event.

d. Components of a Learning Objective. Prior to writing a learning objective, it is important to have an understanding of each of the three components: behavior, condition and standard.

(1) Behavior. The behavior is any activity the student is expected to exhibit after instruction and the primary component of a learning objective. The behavior must:

- 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.

- 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”, which is why these behaviors are not used in developing learning objectives.

- be stated in student terms. Instructors must understand that they may 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.

- be a realistic performance of the behavior in the learning environment. The behavior must reflect what the student will do within the confines of the learning environment and should as closely as possible replicate what the student will do on the job.

(2) Condition. The condition describes the situation/environment in which the students perform the specified behavior. Conditions specify the

resources provided, or not provided, to the student and the environment in which the student must perform the behavior. They include any pertinent influence upon task performance, including any or all of the following: location of performance, environment, equipment, manuals, or supervision required. 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 event. These include references, tools, equipment, job aids, facts, formulas, specific situations, special instructions, and cues. If the event 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.

Example: Given tools and equipment, tune an engine...
Example: Given an observation scenario, complete a "SALUTE" report...

2. Limiting Conditions. Any information or resource that is not available to the student is considered a limiting condition.

Example: Without the aid of references, perform immediate action...
Example: While blindfolded, assemble an M16 rifle...

(b) Environmental Conditions. Environmental conditions describe the environment in which the student will be performing the behavior. Physical conditions deal with the time of day, weather, location, and/or facilities. Social conditions refer to the student as an individual but they may also identify the student as a member of a team which is a social condition. These conditions can be physical or social.

Physical conditions: During the hours of darkness, conduct a patrol...
In a mess galley, prepare pastries...
Social conditions: As a member of a machine gun team, conduct a hasty...

(c) Implied Conditions. In some cases the condition may be implied, as in "recite the Gettysburg Address". The implied condition is "from memory" and that qualifier may be omitted since it is implied by the verb recite. Quite often the verb or object in a learning objective will have an implied condition in it. The below example has several implied conditions. It implies that the driver will have an LAV and whatever else is required to operate it over rough, hilly terrain, including not having the reference.

Example: Given rough, hilly terrain drive an LAV...

(3) Standard. The standard establishes a criterion for how well the task or learning objective must be performed. Standards state the quantity and/or quality of acceptable behavior. There are four criteria for a good standard: completeness, accuracy, realistic, time or "CART".

(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, and pieces that must be covered or produced, or any quantitative statement that indicates an acceptable portion of the total.

Example: ...list 3 of the 5 performance steps.
Example: ...tune an engine so that it idles between 900 and 1100 RPMs.

(b) Accuracy. A standard indicates what is considered an accurate performance of an event 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 in the appropriate section.

Example: ...solve a mathematical problem to within two decimal points.
Example: ...fire the rifle with a minimum score of 25.

(c) 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.

(d) Time. If the event is time critical, then the minimum time requirement must be specified in terms of days, hours, minutes, or seconds.

Example: ...don the field protective mask within 9 seconds.
Example: ...generate a 5-paragraph order in less than 2 hours.

e. Record Learning Objectives. The Learning Objective Worksheet provides a standardized template with information necessary to input into MCTIMS CMD – Learning Objective Editor. The LOW is a required element of the MLF. Refer to reference (b) for more information on the required MLF components.

f. Writing TLOs. The T&R Manual describes the real-world event the Marine performs in the OPFOR. Each event in the T&R Manual designated to be taught at the Formal School has a corresponding TLO. TLOs tell the student how they will be tested and provide a base from which curriculum developers will write test items. Therefore, the curriculum developer must consider the projected method used to test when writing TLOs as well as the resources available to the school. Generally speaking, the TLO will be a verbatim reflection of the associated T&R event.

(1) Compare the Formal School resources against the task list. If the school does not possess the resources to teach the T&R 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. 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 POI. Figure 5-4, TLO Construction Flowchart, provides a guide for this decision making process.

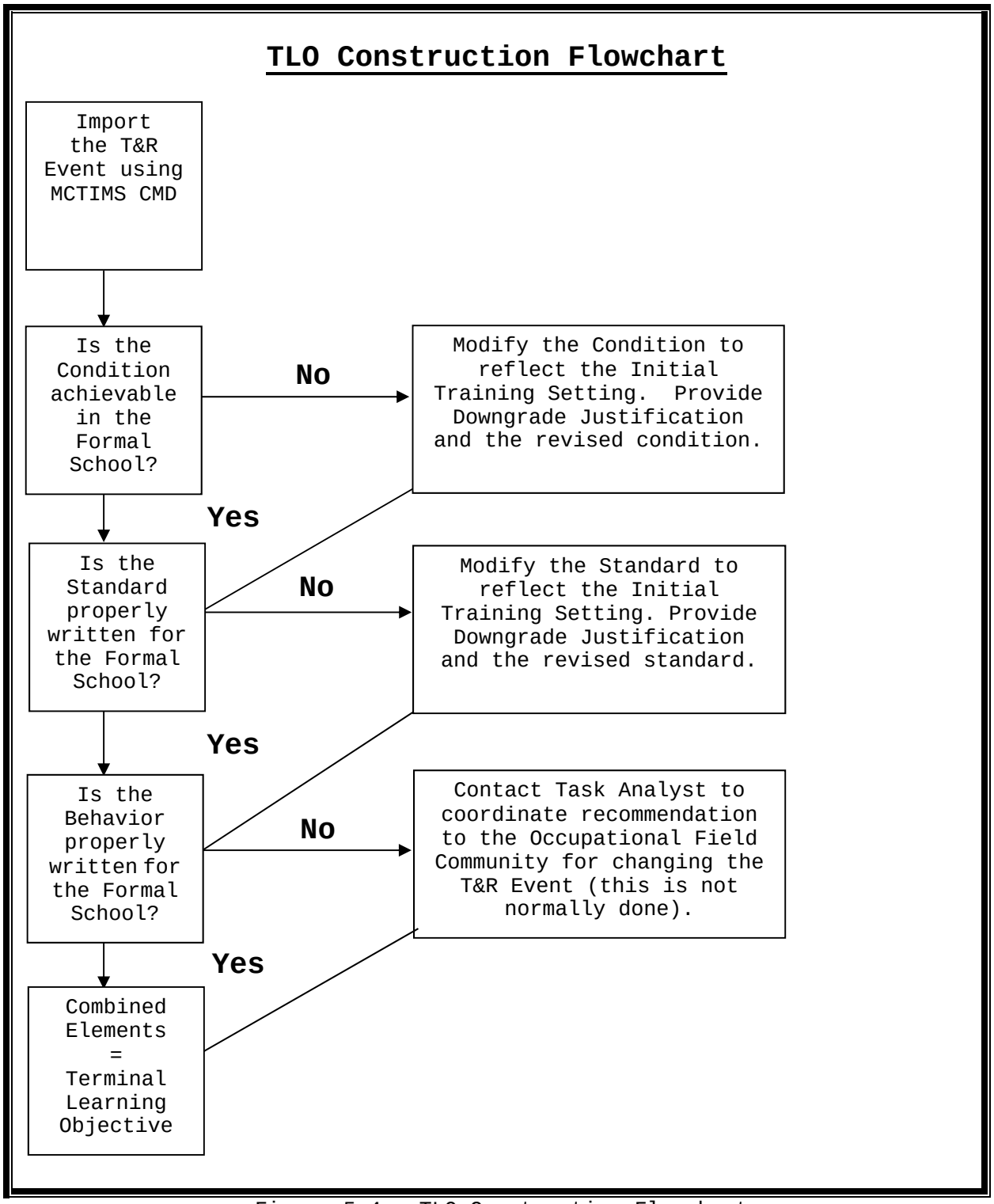

Figure 5-4.--TLO Construction Flowchart

(2) Steps for Writing TLOs

(a) Step 1: Determine Formal School Resource Availability. The first step is to compare Formal School resources against the T&R event list in order to determine if a course of action is required. If the Formal

School does not possess the resources to teach the event to standard, there are two possible courses of action: Downgrade the TLO or Request additional resources.

1. Downgrade Justification. If a TLO cannot be executed as written due to factors, such as resource constraints, safety, or range access then the TLO will be downgraded to fit the learning setting in which it will be executed. Modification of any element of the behavior, condition, or standard will only be done only as a last resort and with the authorization of the approving CG. There are two types of downgrade justifications:

a. Downgrade an Individual TLO. If the behavior, condition, or standard necessitates modification, then a downgrade justification must be provided using the Learning Objective Editor located in MCTIMS CMD. Once entered, it will appear in each individual concept card affected within the POI. Figure 5-5 provides an example of downgrading an individual TLO.

T&R EVENT:	*Given a report, source documentation, access to SABRS or other appropriate feeder system, and the references, correct transactions on performance indicator reports ensuring the timeliness and accuracy of transactions.*
TASK LIST NOTES:	The following event has been downgraded in the POI: 3451-FMGT-1008.
CONCEPT CARD: DOWNGRADED TLO	Given *necessary reports*, source documentation, access to SABRS, *screen shots of feeder system*, and the references, correct transactions on performance indicator reports ensuring the timeliness and accuracy of transactions. Downgrade Justification: This TLO requires access to GCSS-MC, PR Builder, and SABRS Management Analysis Retrieval System (SMARTS). The Formal School does not have access to these systems in their Virtual Training Environment. The downgraded event will be taught to the students using screen shots of the systems and the provided reports.

Figure 5-5.--Downgrade an Individual TLO (Example)

b. Downgrade Multiple TLOs. If a Formal School determines that a POI consists of multiple TLOs that will require a downgrade due to the inability to meet the behavior, condition, or standard identified in the T&R event(s), then a blanket statement can be provided in the POI Task List Notes explaining the downgrade justification. Figure 5-6 provides an example of downgrading multiple TLOs.

TASK LIST NOTES:	The following events have been downgraded in the POI: 0911-FIT-2012, 0911-INST-2021, 0911-INST-2023, 0911-LEAD-2031, 0911-INST-2032, 0911-INST-2033, 0911-INST-2034, 0911-INST-2035, and 0911-INST-2037. Downgrade justification: Due to time and resource constraints, these events are not achievable as performance based events and have been downgraded so they may be assessed via written examination.

Figure 5-6.--Downgrade Multiple TLOs (Example)

2. Request Additional Resources. Refer to reference (b), Chapter 5, for Planning, Programming, Budgeting, and Execution (PPBE) processes.

(b) Step 2: Determine Evaluation Methods. If the behavior is performance-based, then a performance evaluation of the process, the product, or both needs to occur. If the behavior is knowledge-based, then the evaluation will be written or oral. For example, if it is a performance based TLO, then the majority of the ELOs must be performance based and vice versa for knowledge based TLOs. Since resources are often limited, performance-based evaluation and remediation are not always possible (remediation is not counted as academic time). However, every attempt must be made to secure required resources from TECOM to ensure that training and evaluation replicate actual job conditions and standards.

(c) Step 3: Record Completed TLO. The final step in writing the TLO is to record it. Tasks are imported directly from MCTIMS T&R Module and will be edited in MCTIMS CMD based on the results of TLO development. The TLO must be written in the form of a complete sentence. TLOs can be initially recorded on the LOW for future input into MCTIMS CMD – Learning Objective Editor.

g. Writing ELOs

(1) Per reference (b), 1000-level MOS producing courses shall have a minimum of two ELOs to demonstrate the doctrinally based building blocks for instruction. TLOs will not be repeated as ELOs since this is contrary to a logical learning analysis. The students are essentially “reinforcing” previously learned skills. In these cases specific justification will be required as part of the CO’s Cover Letter if there are no associated ELOs with a TLO.

(2) ELO's are subordinate to the TLO and are derived from the identified KSAs needed by the students in order to perform the steps listed in the T&R Event. They are written to emphasize teaching points and to evaluate student understanding/performance. For each grouping of KSAs not labeled as “TPD” or “DEL” an ELO is generated. Remember, the number of ELOs is usually not equal to the number of T&R performance steps. There may be more ELOs or less depending on how KSAs were grouped.

(3) Steps for Writing ELOs

(a) Step 1: Document the Behavior. The draft behavior statement identified during the learning analysis may need to be modified so that it follows the rules of a well-written behavior. 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 and attitudes?” This behavior must support the building block approach to accomplishing the TLO within the resources of the school house to replicate performance in the operating forces.

(b) Step 2: Determine the Condition and Standard. The starting point for each ELO’s condition and standard should be the TLO condition and standard. However, when writing the ELO’s, modification to the condition and/or standard may be needed in cases where the TLO is a performance based objective and during the learning analysis a knowledge based behavior was developed to support the TLO. In order for a student to master the

performance objective, a knowledge based ELO is necessary to ensure students have the knowledge to perform the objective successfully and safely.

Example: If the TLO behavior is "engage targets"; but the ELO states "Identify the characteristics of the weapon", then a knowledge based ELO condition and standard must be written to ensure students can perform the objective successfully.

(c) Step 3: Record Completed ELO. 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: "*While blindfolded, disassemble the M4 carbine service rifle in 30 seconds or less*." It is critical to ensure that all the Performance Steps of a given T&R Event are covered by the developed ELOs. The best way to accomplish this is to compare the ELOs to the groupings of KSAs. ELOs can be initially recorded on the LOW for future input into MCTIMS CMD – Learning Objective Editor.

h. Develop Test Items for Learning Objectives

(1) Analyze Learning Objectives. The purpose of any test is to find out whether the objectives of a lesson have been achieved by the student. If an event is important enough to dedicate resources to teach it, then it is equally important enough to dedicate resources to evaluate the event. Test items are designed to determine if the student has acquired the KSAs to perform the event. This promotes student 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. Prior to writing the test items, the curriculum developer must analyze the behavior, condition, and standard of the learning objective. 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. TLOs and ELOs may be evaluated more than once, however, this is not common practice and must serve a purpose. In this case the effected concept card should have a note explaining this evaluation.

(2) Determine Test Item Type. The domains of learning can be used when deciding how to appropriately test a student as noted in Figure 5-7.

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
Evaluation	No	No	No	No	Yes	Yes	No	Maybe
Synthesis	No	No	No	No	Yes	Yes	No	Maybe
Analysis	Maybe	No	No	Maybe	Yes	Yes	No	Maybe
Application	Yes	No	No	Yes	Maybe	Maybe	Maybe	Maybe
Comprehension	Yes	Yes	Yes	Yes	No	No	Maybe	No
Knowledge	Yes	Yes	Yes	Yes	No	No	Maybe	No
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
Characterization	No	No	No	No	Yes	Yes	No	Yes
Organization	No	No	No	No	Yes	Yes	No	Yes
Valuing	Maybe	No	No	No	Yes	Yes	Yes	Yes
Responding	Yes	No	No	Maybe	Maybe	Maybe	Yes	No
Receiving	Yes	Maybe	Maybe	Yes	No	No	Yes	No
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
Origination	No	No	No	No	No	Maybe	No	Yes
Adaptation	No	No	No	No	No	Maybe	No	Yes
Complex Overt Response	No	No	No	No	No	Maybe	Maybe	Yes
Mechanism	No	No	No	No	No	Maybe	Maybe	Maybe
Guided Response	No	No	No	No	No	Maybe	Maybe	Maybe
Set	No	No	No	No	No	No	Maybe	Maybe
Perception	No	No	No	No	No	No	Maybe	Maybe

Adapted from Planning Instruction for Adult Learners By P. Cranton, 1989, Toronto, Ontario: Wall & Emerson, Inc.
Yes = Appropriate Maybe = Can be appropriate in some situations No = Never appropriate

Figure 5-7.--Using learning domains to determine test item type

(3) Write Test Items. There are two primary types of evaluation techniques used to measure student mastery of learning objectives: knowledge-based (cognitive) and performance-based (psychomotor/cognitive). The Marine Corps strives for performance-based instruction and testing to increase the transfer of learning from the learning environment to the job.

(a) Knowledge-Based Evaluation. 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, condition, and standard 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 Schools 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-Based Test Items consist of true/false, multiple-choice, matching, listing, fill-in-the-blank, short answer, labeling, and essay. Refer to Appendix A for additional information on knowledge-based test items.

1. True/False. 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.

2. Multiple Choice. 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.

3. Matching. 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.

4. Listing. 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.

5. Fill-in-the-Blank. 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.

6. Short Answer. 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. For a Short Answer Checklist, refer to the Fill in the Blank Checklist.

7. Labeling. 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).

8. Essay. 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.

(b) Performance-Based Evaluation. Used to measure how well the student has mastered the psychomotor (physical) and cognitive (mental) skills required for task or job performance. Writing performance-based test items involves determining whether the focus of the assessment is the process, product, or both. A performance evaluation 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, then 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 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. Writing performance-based test items involves stating the performance objective, creating the checklist (if applicable), instructions to the evaluator, and instructions to the student. Refer to Appendix B for additional information on performance-based test items.

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 either be 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 will identify which of these will be used in the overall evaluation of the student. Additionally, a determination of whether the student should have the checklist when being evaluated must be made.

2. Process Checklist. When a performance-based evaluation 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. The steps or activities must be defined, observable, and sequenced in order of performance. Space for "checking" the performance of each step or activity and recording/describing errors are provided. Process checklist 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. Instructions to the Evaluator. 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. The instructions cover what the evaluator needs to evaluate the student, such as checklists or tools. Additionally, they state any start/stop signals, safety considerations, and 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. They must be detailed enough to cover everything the evaluator needs to know or do to make the evaluation happen.

4. 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.

(4) Record Test Items. Curriculum Developers can use the Test Item Checklist located on the MTESD Sharepoint site to assist in the development of test items. Once determined, they will be recorded on the LOW for future input into MCTIMS. This will provide a catalog of the test items by ELO for use in producing tests and Questionmark Perception (QMP) electronic testing.

i. Select Instructional Methods. An instructional method is the means used to present information to the student. The method selected will have a direct impact on both the quality of the 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.

According to Bloom's Domains of Learning, domains are used to determine the appropriate selection of instructional methods as noted in Figure 5-9. The higher level order skills are on top of each list.

DOMAIN	LEVEL OF LEARNING	MOST APPROPRIATE METHODS
COGNITIVE DOMAIN	**EVALUATION**	Independent/Group Projects, Field Experience, Laboratory
	SYNTHESIS	Independent/Group Projects, Field Experience, Role Playing, Laboratory
	ANALYSIS	Discussion, Independent/Group Projects, Simulations, Field Experience, Role Playing, Laboratory
	APPLICATION	Discussion, Simulations and Games, CAI, Modularized Instruction, Field Experience, Laboratory
	COMPREHENSION	Lecture, Modularized Instruction, Programmed Instruction
	KNOWLEDGE	Lecture, Programmed Instruction, Drill and Practice
AFFECTIVE DOMAIN	**CHARACTERIZATION BY A VALUE**	Independent Projects, Field Experience
	ORGANIZATION	Discussion, Independent/Group Projects, Field Experience
	VALUING	Discussion, Independent/Group Projects, Simulations, Role-Playing, Field Experience
	RESPONDING	Discussion, Simulations, Modularized Instruction, Role-Playing, Field Experience
	RECEIVING	Lecture, Discussion, Modularized Instruction, Field Experience
PSYCHOMOTOR DOMAIN	**ORIGINATION**	Independent Projects, Games, Field Experience
	ADAPTATION	Independent Projects, Games, Field Experience
	COMPLEX OVERT RESPONSE	Games, Field Experience
	MECHANISM	Games, Role-Playing, Field Experience, Drill and Practice
	GUIDED RESPONSE	Peer Teaching, Games, Role-Playing, Field Experience, Drill and Practice
	SET	Demonstration (lecture), Drill and Practice
	PERCEPTION	Demonstration (lecture), Drill and Practice

Figure 5-8.--Using learning domains to select instructional methods

(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. Consider the characteristics listed in Appendix F carefully to ensure that the appropriate methods are selected for the instructional system. NOTE: The learning sciences have concluded that passive, lecture-based instruction provides minimal student engagement, which subsequently does not capitalize on prior experience and, therefore, should be carefully considered prior to determining as the identified facilitation method.

(a) Learning Objectives. The desired learning objective must be taken into consideration. Therefore, the method choice must complement the kind of learning to be undertaken by the students (e.g. cognitive, psychomotor, or affective). Based upon the domain and the level required by the learning objective, instructional methods are chosen that will enable students to perform at the specified level. A combination of methods works best. For example, if the learning objective requires the student to perform a task, the curriculum developer and the instructor must collaborate to ensure that the appropriate methodology is relative to performance-based instruction.

(b) Target Population Description (TPD). Consider the level of motivation, background, knowledge, and skill level of the target population. Are the students entry-level or career-level Marines? What kinds of experience do they already have? Design your curriculum at a level appropriate to your TPD, avoid teaching the "basics" to experienced students through lecture. Incorporate other methods that allow for more student participation (e.g. questioning, case study, role-play).

(c) Transfer of Learning. Transfer of learning from the learning environment to the job is most likely to happen when the conditions of learning best replicate what is being required 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 (auditory, visual, and kinesthetic) into instruction. For example, if it has been determined that the TPD learns best kinesthetically, then consider methods that are interactive and allow students to do something. Simulation and/or practical application methods should be considered.

(d) Adult Learning Principles. Typically, adults are self-directed learners and bring their own experiences to the classroom. Research has shown that they learn best through problem-based learning, in small groups, and when challenged. For example, if the course is entry level, the students may not bring a lot of experience to the classroom and problem-based learning may not be appropriate. Also, courses for entry-level students are generally large in size, which may not allow for certain interactive methods.

(e) Resource Constraints. Although resource constraints should not be the primary factor in determining instructional methods, availability of resources must be considered. This can include the level of instructor experience available, class size, evaluation potential, and the ability to meet the individual needs of the students. However, new methods will never be incorporated to break the status quo if curriculum developers do not identify the necessary resources to improve instruction. 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.

(2) Select and Record Instructional Method(s) on LOW. Select the appropriate method after reviewing method considerations. The instructional method chosen is recorded on the LOW. Method(s) must be selected for each learning objective. All of the method(s) selected for the ELOs must be placed on the LOW. The selected method(s) are then recorded in MCTIMS for inclusion on the LOW, which is part of the POI.

j. Select Instructional Media. In any instructional situation there is a message that needs 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.

(1) Consider the Advantages and Limitations of Media. Media has various characteristics that make it either suitable or unsuitable for particular learning settings. Consider the characteristics listed in Appendix G carefully to ensure that the appropriate media are selected for the instructional system.

(2) Select and Record Instructional Media on LOW. Media selection 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 and takes into consideration the theories of adult learning. Forms of media have various characteristics that make them either suitable or unsuitable for particular training situations. Careful consideration of the characteristics of each media type will ensure that the appropriate media are selected for the specific instruction given to a specific audience. Examples of media: printed materials, dry erase boards, turn charts, models/mock ups, actual item/object, slides, video, computer based training (CBT), video teleconference. The instructional media chosen is recorded on the LOW. It is important to record this information on the LOW because it will be used during the development of your media and allows you to stay focused on the design. The selected media is also recorded into MCTIMS to capture the resources being dedicated to the learning objective and is inclusive in the POI.

5. Sequence Learning Objectives

a. Purpose. Sequencing learning objectives provides a foundation for developing the course structure. Even though ELOs have been previously sequenced in the context of each task, now all of the learning objectives need to be sequenced in the context of the entire course. Up until this point all decisions have been made at the task or learning objective level. This is the first course level decision being made in order to complete the learning analysis and begin developing curriculum. Sequencing learning objectives provides the following benefits:

(1) Efficiency. Sequencing learning objectives allows for an efficient system of instruction while avoiding duplication. It also allows the maximum amount of learning to occur over a given time frame. For example: The movement “Order Arms” is the basis of all movements when

drilling with arms. It is a movement that you would want to teach up front and then build upon that knowledge and skill to teach other movements.

(2) Transition. Properly sequenced learning objectives allow your students 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 learning objectives serve as a rough course structure and outlines your strategy for instruction. This is important as it facilitates learning, particularly when introducing new instruction. This transfer of learning is maximized when closely related learning objectives are kept and taught close together. Figure 5-9 provides the steps for sequencing learning objectives.

STEPS FOR SEQUENCING LEARNING OBJECTIVES
1. Group the learning objectives based on shared elements.
2. Determine if the relationship between the learning objectives is dependent, supportive, independent, or conflicting.
3. Arrange learning objectives based upon their relationship. ➢ Sequence the learning objectives with **dependent relationships** in a hierarchical arrangement. ➢ Sequence learning objectives with **supportive relationships** in an order that permits optimum transfer of learning from one learning objective to another. ➢ Sequence the learning objectives with **independent relationships** in any logical order. Since the learning objectives are independent of one another, the sequence in which they are presented will not affect learning. Remember that these learning objectives stand alone and should not be placed between dependent or supportive learning objectives as this would disrupt the transfer of learning. ➢ Sequence the learning objectives with **conflicting relationships** between learning objectives that involve opposite responses to the same cue in a different context.

Figure 5-9.--Steps for sequencing Learning Objectives

b. Grouping Learning Objectives. Before learning objectives are sequenced, they should be grouped. If learning outcomes were developed, then the learning objectives will be grouped according to their overarching focus (e.g. course, phase, annex).

(1) Same Subject. Learning objectives that deal with the same subject have a shared element relationship and may be grouped together.

(2) Same Object. Learning objectives with the same object may be grouped together (i.e. all TLOs pertaining to the M16 rifle or all learning objectives pertaining to a communications annex). Same object learning objectives can often be determined by reviewing the T&R Events, because all tasks are grouped by duty areas that define similarities among them. Learning objectives may be grouped by these same areas also. Grouping

learning objectives this way maximizes the mastery of learning objectives, because closely related learning objectives are kept together.

(3) Same Condition. The environment and the resources within a school should be considered when grouping learning objectives. Learning objectives may be grouped by like resources (i.e. 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 (i.e. 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.

c. Sequencing Learning Objectives. To logically sequence learning objectives, the curriculum developer must determine the relationship among them. The four most important relationships in sequencing learning objectives are dependent, supportive, independent, and conflicting.

(1) Dependent Relationships. Dependent relationships exist between learning objectives that are a prerequisite to other learning objectives. Personnel must master the dependent learning objective before they can master the others. Figure 5-10 provides an example of dependent relationships.

DEPENDENT RELATIONSHIPS (EXAMPLE)
Example 1: “Right Shoulder Arms on the March”; this movement has a dependent relationship because one must first teach Right Shoulder Arms while halted and how to march. **Example 2:** “Drive a HMMWV”; driving a HMMWV has a dependent relationship to “drive a 7-Ton MTVR” because the MCO states one must have a HMMWV license prior to driving a 7-Ton MTVR.

Figure 5-10.--Dependent Relationships (Example)

(2) Supportive Relationships. In supportive relationships, the learning involved in mastery of one learning objective transfers to the other, making learning involved in the mastery of the other easier. Learning objectives 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 Developer’s expertise in the subject matter and subjective judgment of what makes the learning of a task easier. Figure 5-11 provides an example of supportive relationships.

SUPPORTIVE RELATIONSHIPS (EXAMPLE)
Example 1: “Swim 25 meters on your side. Swim 25 meters on your back”; The two learning objectives are similar and would benefit from being taught next to each other during training; however, it is not absolutely dependent to teach them closely together. **Example 2:** “Disassemble the M9 pistol”; Disassembling the M9 pistol has a supportive relationship to "Assemble the M9 pistol."

Figure 5-11.--Supportive Relationships (Example)

(3) Independent Relationships. In an independent relationship, skills and knowledge in one learning objective are unrelated to those in another learning objective. Arrange learning objectives with independent relationships in any reasonable sequence. They should not be placed between learning objectives with dependent or supportive relationships. Figure 5-12 provides an example of independent relationships.

INDEPENDENT RELATIONSHIPS (EXAMPLE)
Example 1: "Balance a checkbook" is independent of "select investments." **Example 2:** "Disassemble the M4" is independent of "Disassemble the 9mm pistol."

Figure 5-12.--Independent Relationships (Example)

(4) Conflicting Relationships. Conflicting relationships exist between learning objectives 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 learning objective(s) to be conflicting usually involves a visual or auditory cue within the learning objective(s). Remember to sequence the learning objective(s) with conflicting relationships as close to one another as possible so that the conflicting issues/concerns can be addressed. Figure 5-13 provides an example of conflicting relationships.

CONFLICTING RELATIONSHIPS (EXAMPLE)
Example 1: "As a member of a platoon and on the command fall in, fall in platoon formation" and "As a member of a platoon under arms and on the command fall in, fall in platoon formation", the objective is to have the platoon move into a formation at normal interval. This drill movement means two different things, depending on with or without weapons. **Example 2:** "As a member of a platoon and on the command right face, execute a right face" and "As a member of a platoon under arms and on the command right face, execute a right face", the same holds true. Depending on whether or not the platoon is armed or unarmed determines the conflict in relationship.

Figure 5-13.--Conflicting Relationships (Example)

d. Learning Objectives 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. Figure 5-14 provides an example of a relationship table.

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

Figure 5-14.--Learning Objective Relationship Table

6. Determine Subordinate Learning Outcomes. Once learning objectives are grouped, subordinate learning outcomes will be linked directly to the course learning outcomes and may occur at multiple levels within a POI in order to align TLOs/ELOs with an overarching focus of the learning objectives (e.g. phase, annex). Regardless of the level, there should be a hierarchy of relationships between behaviors and mental associations so that the conditions and standards for observable learning objectives directly relate to course and subordinate learning outcomes. Refer to Chapter 4 (Figure 4-3) for the standardized outcome criteria necessary for developing learning outcomes. Figure 5-15 illustrates how TLOs/ELOs align to subordinate learning outcomes at the phase or annex level, which ultimately support the course learning outcome.

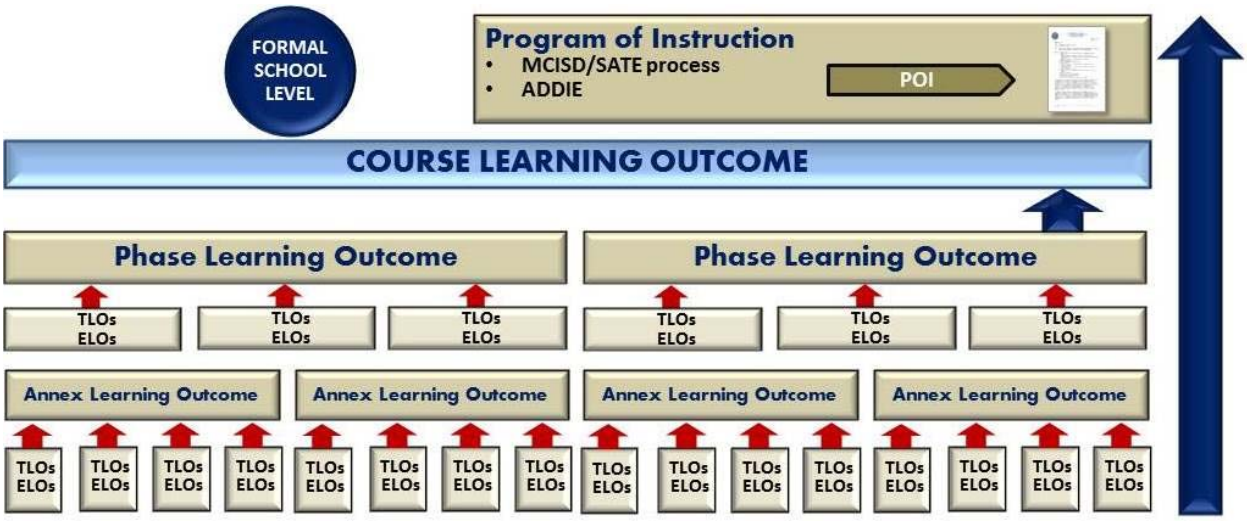

Figure 5-15.--Learning outcome hierarchy

7. Determine Assessment Instruments for Learning Outcomes. Individual assessments are developed specific to each learning outcome. The below list provides some of the most common instruments, but is not all-inclusive. Reference (r) provides more detailed information and examples on assessment instruments.

a. Checklists. Most Marines are already familiar with checklists. Typically, they list go/no-go criteria related to learning objectives/outcomes and they support rapid assessment of Marines' behaviors, knowledge, and skills. Checklists can be used to record observations, to self-assess, to let students know what criteria will be used to evaluate their work, and to track students' progress over time. They also may be used for individuals, groups, or even the whole class.

b. Behaviorally Anchored Rating Scale (BARS). BARS is a checklist-style rating system that instructors can use to assess performance goals based upon Marines' observable actions, like delivering orders to subordinates or conducting a tactical debrief. A BARS lists different levels of competency (e.g. novice, journeyman, expert) on a variety of performance items and then briefly describes behaviors that distinguish among the different levels. As with a standard checklist, instructors can use a BARS to rate Marines' execution of some task, but BARSs are superior to checklists because they include clearer, observation-based indicators of performance and learners can see where they rate on a spectrum of performance.

c. Rubrics. A rubric lists a set of criteria and their associated standards. Rubrics are typically designed in a grid format, with a fixed rating scale (e.g. 1–5 or Novice–Expert) on one axis and a set of key performance goals across the other. Similar to a BARS, each cell of a rubric includes a definition or example of the performance characteristics at that level. Unlike a BARS, however, rubrics may include more lengthy, non-behavioral factors (e.g. writing quality) and evaluators frequently use rubrics after the fact, to assess the outcomes of students' endeavors or the products of their efforts. Assessment devices, like BARSs and rubrics, are more meaningful to Marines than simple, number-based scores because they use well-defined criteria to reveal specific gaps in proficiency, show the path for improvement, and support the delivery of targeted feedback.

d. Card Sorting. Card sorting assesses how Marines mentally classify or structure concepts. As the name implies, with the card sort technique, learners sort a list of specific concepts or vocabulary terms (often provided on note cards) into 4–6 specific categories. Learners may define their own categories (open sort) or instructors may assign predefined categories (closed sort). For formative assessments, the open-sort method is preferred because it gives learners more freedom. When using the open-sort approach, ask Marines to label each pile with a descriptive name — this can further reveal their conceptualization of the topic. For summative assessments, the closed-sort method limits subjectivity and makes it easy to score.

e. Concept Maps. Concept maps reveal Marines' mental "file folders" (including their knowledge gaps and misconceptions) on a complicated topic by visually depicting the concept, its subcomponents, and their relationships. Concept maps are picture-based tests that ask learners to break a complex idea into its component parts and depict the relationships among those parts. In a concept map, the subcomponents of a concept are shown in boxes (with words or phrases) and these are connected to one another by arrows. The arrows are also labeled and these phrases describe the relationship between the connected concepts. They are best used to assess whether learners have completely understood a concept and are best delivered at the end of a classroom-based lesson.

f. Metacognitive Prompts. Metacognitive prompts are questions that require Marines to reflect on their knowledge, and then demonstrate their comprehension and conceptual understanding of a topic. They generally assess Marines' comprehension of specific concepts and how they relate to one another. This is similar to concept maps; however, where concept maps broadly assess a full topic area, metacognitive prompts more deeply assess the relationship between pairs of specific concepts.

g. Situational Judgement Tests. Situational Judgment Tests (SJTs) include a realistic scenario followed by potential COAs. Scenarios may be presented as written or multimedia short stories. For formative assessments, learners may be asked to rank-order the COAs and then rate each of them on a Likert scale. For summative assessments, the COAs are typically presented in a multiple choice format. In both cases, an open-response area may be included to allow learners to add extra remarks. Well-constructed SJTs require learners to integrate concepts, apply their knowledge to complex realistic problems, contend with ambiguous information, and select among imperfect choices. SJTs effectively assess learners' complex problem-solving skills, and they provide evidence about Marines' mental flexibility.

CHAPTER 6

DEVELOP PHASE

1. Introduction. The Develop Phase builds on the outputs of the Design Phase to produce a POI and the MLF. Figure 6-1 illustrates the inputs and outputs of the Develop Phase.

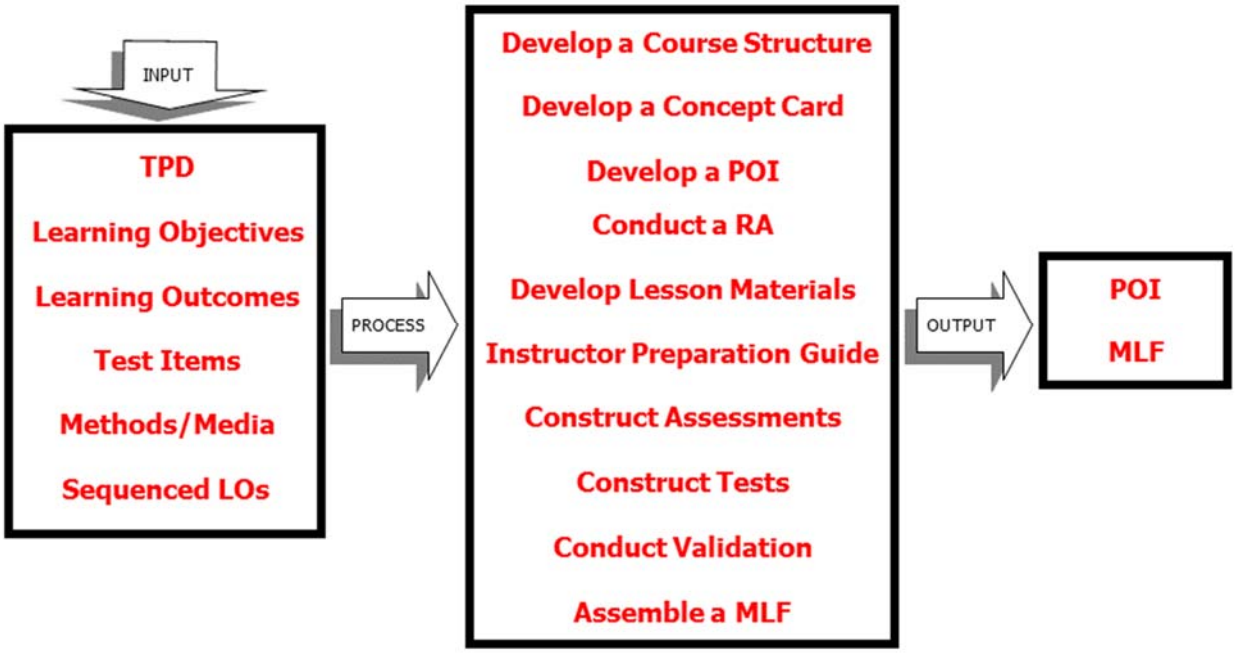

Figure 6-1.--Develop Phase Flowchart

2. Develop a Course Structure. The course structure is a detailed chronological document identifying the implementation plan for a course. The purpose of developing a 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. It provides an outline of how the lessons in the course will flow from start to finish. A course structure is not a course schedule; however, it does provide a guideline for developing the course schedule. It contains all academic and administrative events that take up the time allotted for the course. Instructional hours not supporting the instruction or evaluation of course learning outcomes/learning objectives should be carefully considered. At a minimum, a course structure will contain Lesson Designators, Lesson Titles, Methods and Academic hours - each from the pertinent Concept Card. The four steps for developing a course structure are: review source materials, determine lesson/exam content, estimate instructional hours, and assign lesson/exam titles and designators.

a. Review Source Material. The first step is to review the following:

(1) The LOW for the course, which contains the TLOs and their associated ELOs, teaching methodologies, and any associated test items.

(2) Directives from HHQ that may influence the length of the course.

(3) School SOP for any additional school academic requirements that may affect the course.

b. Establish Content. The second step is to decide how many objectives are appropriate for a single lesson or exam, then assign titles and designators to them. The following is a process used to determine lessons/exams.

(1) Review Objectives

(a) Complexity of an Objective. 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.

(b) Domain of an 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.

(c) 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. Learning objectives are organized so that the group has a natural beginning and ending point. Look for “natural breaks” in the sequenced learning objectives that indicate major changes in subject matter.

(2) Consider the TPD. The level of experience that an average student will bring into the classroom must be considered. Due to 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.

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

(4) Assign Lesson/Exam 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. School SOP may provide guidance for the assignment of designators. Further, the rationale for assigning lesson/exam designators is located in Section IV of the POI.

c. 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. All time (academic and administrative) must be accounted for in training days and, consequently, in the calendar days of the course. All other events not directly related to the structure of the course are non-academic in nature and not considered when building a course structure (e.g. PT, chow, movement time). If the estimate exceeds the maximum authorized training days, the Formal School must contact CG, TECOM (MTESD) for guidance. When estimating instructional time, consult and review the following:

(1) 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.

(2) The number and complexity of learning objectives within each lesson. If it is lengthy or technical, the lesson may need to be divided into several lessons.

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

(4) Review the instructional method(s) selected for each learning objective. Instructional methods often prescribe time tables for their application. A circular reflection is often timed by allotting two minutes for each student.

(5) Review the currently approved POI, which will state the training days authorized for the course.

(6) Remediation is neither academic nor administrative time and must be conducted when estimating instructional hours. Amplifying information can be found later in this chapter.

d. Assign Lesson/Exam Titles and Designators. These codes are a quick way to identify a lesson or exam. Figure 6-2 provides an example of how specific criteria can be captured in a course structure.

Training Day	Total Hours	Lesson Designator	Lesson Title	Method	Hours by Method
TD-01					
	0.50	CDC-001	Check-in	Admin	0.50
	1.00	CDC-002	Course Overview	Brief	1.00
	1.00	CDC-100	Review MCISD/SATE	Informal Lecture Peer Seminar	0.15 0.45
	0.50	CDC-200	T&R Manual	Informal Lecture	0.50
	1.25	CDC-300	Employ MCTIMS	Informal Lecture Demo Prac Ap	0.15 0.15 0.45
	1.50	CDC-400	Principles of Adult Learning	Informal Lecture Prac Ap	1.00 0.50
	1.50	CDC-500	Write a TPD	Informal Lecture Demo	1.00 0.50
	1.00	CDC-500XP	Write a TPD Performance Exam	Individual Performance Exam	1.00
				Daily Total	**8.00**

Figure 6-2.--Course Structure (Example)

3. Develop a Concept Card. 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 summary of instructional hours. TLOs will only appear on a concept card for a lesson or exam during which students will actually be exposed to or perform the actual TLO. Exception: Courses that do not involve the expenditure of ammunition shall include the parent TLO on every concept card that features a corresponding ELO. 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 is to document the Formal Schools plan for implementing the T&R Events within

the learning setting. There are two categories of concept cards: Academic and Administrative.

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

(1) Lesson Purpose. Lesson purpose concept cards are created when the instructional content is not specifically related to a T&R Event, does not address any TLOs/ELOs, and is not testable. The lesson purpose concept card will have a clearly defined lesson purpose statement reflecting the rationale for presenting the lesson (e.g. overview, orientation, or enrichment lesson). The overall importance to the effectiveness of the POI must be considered when determining the amount of lesson purpose time. Formal Schools should strive to meet the goal of no more than one hour of lesson purpose time a week, so as to remain focused on instructing and evaluating the learning objectives of the course. If more lesson purpose time is necessary, justification of additional hours will be provided in the CO's cover letter during POI submission. Coordination with the MTESD Task Analyst is essential in determining if T&R events need to be added or if lesson purpose classes are the appropriate solution.

(2) Task Oriented. Task oriented concept cards identify the instructional content as it relates to the learning objectives of the POI. They address one or more TLOs and the associated ELOs being taught.

(3) Exam. Exam concept cards capture the resources required for the evaluation of at least one task within the task list (ITE/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 that is available to Formal Schools, but must be accomplished with resources provided for the course. These hours do not count toward the 40 hour training week. Exceptions to this policy may be authorized by CG TECOM.

b. Administrative Concept Card. Administrative concept cards capture all of the non-instructional information required to conduct the course. Examples can include, but are not limited to: Checking in/out, Graduation practice/graduation, Specialized uniform/equipment fittings, Medical appointments, Weapons cleaning. Administrative concept cards are found in Annex Z of the POI.

c. Concept Card Elements

(1) 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.

(2) Lesson/Exam ID. This designator is a unique code assigned to this specific lesson or exam within this course.

(3) Type. When Academic Concept Cards are entered there are three option types: Lesson Purpose, Task Oriented, and Exam.

(4) Category. For a Training Curriculum, objectives from T&R Manuals will have a category of Training.

(5) 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.

(6) Total 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.

(7) Initial RAC. The initial determination of risk associated with a hazard that combines its severity and probability into a single Arabic numeral which can be used to help determine hazard abatement priorities, such as probability and severity.

(8) Residual RAC. This is the risk remaining after controls have been identified and selected. Criteria for what designates a course as High Risk Training can be found in reference (b). Schools will not conduct or include in a POI training events evaluated as residual RAC 1.

(9) Phase (optional). This is a code depicting the phase (e.g. week, month) of the course during which this lesson or exam takes place.

(10) Group (optional). This is a code depicting the instructional group or section of the course during which this lesson or exam takes place.

(11) Methods, Hours, Student:Instructor (S:I) Ratio, Instructor Type, and Facilities.

(a) Methods. Instructional methods selected during the design phase and recorded on the LOW are assigned to the concept card. The method is recorded as a code or abbreviation.

(b) 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.

(c) S:I Ratio. The S:I ratio is determined so that it complements the selected method. For example, a ratio of 30:1 would be appropriate for a class on combat shooting. During practical application where additional instructors are required for closer supervision of the students, and range safety, a 30:5 ratio might be necessary. The difference in these two ratios is determined by how the practical application exercise is actually conducted. Mathematically, MCTIMS will treat the ratios the same for the Instructor Computation Worksheet (ICW).

(d) Instructor Type. The instructor type will be categorized by MOS, Rank, and total number.

(e) Facilities. Facilities are selected to ensure that resources are allocated to the POI and managed, as appropriate. The facilities required for the lesson need to be listed (e.g. classroom type, range, training area). Some facilities may require prior coordination to ensure availability.

(12) Media. Displayed on the concept card are codes that symbolize the media used to support this lesson or exam.

(13) Learning Objective(s)/Lesson Purpose. Academic Concept cards contain either learning objectives or a lesson purpose statement, but not both.

(14) 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 describing 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 number of support rounds. Support rounds are required ammunition above and beyond the requirement for training (e.g. demonstration, aggressors).

(15) 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, or special prerequisites.

(16) References. This section contains the source documents used for development of the lesson or other references which relate to the lesson. At a minimum, it must contain all documents referenced in the learning objectives included on the concept card.

4. Develop a Program of Instruction (POI)

a. School Descriptive Data (SDD). A significant upgrade to the MCTIMS CMD Module has been conducted to better support the Planning, Programming, Budgeting, and Execution (PPBE) process. This upgrade will give the Formal School staff and the higher headquarters staff, better visibility and thus better management of overall resource requirements for specific POIs and Formal School overhead. The SDD will capture a roll up of POI resource requirements and non-POI resource requirements for the Formal School. In order for the higher headquarters resource management functionality to be properly developed and validated, all Formal Schools are required to populate the required information in the CDD(s) and SDD.

b. Requirement. Per reference (b), a POI is a service-level training and education management document that describes a formal course in terms of structure, facilitation, length, intended learning outcomes, and evaluation procedures. An approved POI is required for every course a Formal School delivers signed by the approving CG. It also serves as a historical record that reflects the continual evolution of the course. All elements of a POI are described below.

(1) Commanding Officer’s (CO) Cover Letter. CO/OIC/DIRs certify the validity and accuracy of a POI by signing and routing a cover letter to the appropriate CG, dated the same day the POI is submitted electronically in MCTIMS. If changes are made to a POI that effect resources, a new cover letter will be signed, dated, and submitted to the appropriate CG for approval.

(2) 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: Approval Letter, Record of Changes, Preface, CDD, Summary of Hours, Scope of Annexes, Concept Cards, Student Performance Evaluation, and Distribution List.

(3) Record of Changes. 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. Changes entered in the change log will be administrative and will not include a lengthening of the course or the modification or omission of TLOs. Any major change will be included in an update and resubmission of the POI.

(4) Preface. The preface should include a brief purpose statement and the address where comments and recommendations concerning the POI may be sent.

(5) Section I (CDD)/Other Service Supplemental (OS CDD). The CDD/OS CDD provides a summary of the course including instructional resources, class length, and curriculum breakdown. The CDD consists of 24 elements, which identify resource requirements needed to conduct the course.

(a) Purpose. The CDD is the key document for all TECOM activities involved in the resourcing process and validation of Marine Corps training and education requirements in addition to other service curricula. Accurate reporting of the school's resources and requirements will provide the documentation and justification required to compete for resources in the POM process. Failure to provide accurate resourcing data in the CDD jeopardizes future funding for the Formal School.

(b) CDD Elements

1. Course Title. The course title must reflect what is listed in MCTIMS.

2. Location. Record the complete address for each location the course is taught.

3. Course ID (CID). The CID is a unique, seven digit alphanumeric code composed of several identifying elements. If the course is new, record 'To be determined.' For example, CID M02RMG4 breaks down as follows:

a. 1st digit indicates the branch of service. A = Army; C = Civilian; F = Air Force; M = Marine Corps; N = Navy; O = International

b. 2nd and 3rd digits indicate the course location. In this example "02" indicates Quantico, VA.

c. 4th, 5th, and 6th digits indicate the service school code (SSC). In this example "RMG" is Basic Officer Course.

d. 7th digit indicates the individual school name. In this example "4" is The Basic School.

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 "N/A."

5. Military Articles and Service List Number (MASL). The MASL is a unique, seven digit alphanumeric code used to identify a course

intended for foreign military instruction. If this type of instruction is not applicable, record "N/A."

6. Outcome. The course learning outcome will be linked directly to the service-level outcomes codified in the MOS Manual and/or the T&R Manual.

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. Courses with a specific training need may have an extended academic day. TAs will review the average training day and average training week to evaluate if additional justification from the Formal Schools is required for excessive academic day length.

9. Curriculum Breakdown (Peacetime). Provide a breakdown of the curriculum in academic and administrative hours. 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.

10. Length (Mobilization). Record the total number of instructional days required for the course during wartime mobilization. The minimum mobilization course day is 10 hours. The minimum mobilization course week is 60 hours. (10 hours a day multiplied by 6 working days.). There are no established maximum hours for a training day. If the course will discontinue upon mobilization, enter “N/A.” If the course length is the same during mobilization as in peacetime, click “Same as peacetime”. All administrative hours will be distributed across the number of mobilization training days thus calculated.

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 “N/A.” 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. This section is no longer a requirement in the CDD since the default is the Maximum Class Capacity for identification of resources. Optimum Class Capacity will be removed on the next revision of the NAVMC.

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. Target Population Description/Prerequisites. Identify the TPD and list the prerequisites that personnel must meet to attend the course. This information can be found in the TPD developed in the Design Phase and filed at the school. To reduce lesson purpose time in career progression courses, schools are encouraged to require Marines to complete relevant DL products prior to attending a resident course.

a. CO's waiving prerequisites should track those Marines' performance and submit a waiver progress report quarterly to the appropriate level (e.g. TECOM, TRNGCMD) G-3 via MTESD OPS.

b. At no time will civilians of any source (including government employees, contractors, or external agencies) attend enlisted 1000-level Marine Corps courses (courses with student type code 0EE or 1E requirements in the current Training Input Plan (TIP)) conducted by TECOM Formal Schools. Civilians may enroll in other service 1000-level equivalent courses if permitted by other service policy.

17. MOS Received. Record the MOS assigned to the student upon successful completion of the course. If the course does not result in an MOS assignment, record "None."

18. OccFld. Record the name of the OccFld managing course quotas.

19. Funding. Record the name of the agency that funds TAD 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:

a. Courses over 139 days or 20 weeks at one location are considered a PCS move and funded by Manpower Management Officer Assignment (MMOA)/Management Manpower Enlisted Assignment (MMEA).

b. Courses less than 139 days or 20 weeks may be unit-funded or TECOM-funded.

c. ELT students. Normally funded by MMOA or MMEA.

d. Lateral Move. May be unit-funded or TECOM-funded.

e. 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). 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 by MCTIMS in the ICW of the POI. It allows the school to reflect the total "Instructor Staffing Requirements" for a course by Billet Identification Code (BIC), Grade, Billet description, Grade, Rank, Service, MOS, whether the position is either Filled or Vacant. For Formal Schools with Inter-service Training

Review Organization (ITRO) agreements, instructor staffing is computed using the ITRO manpower computation formula found in reference (o). Although instructor-staffing increases may be validated based on an approved POI, the POI itself will not generate a table of organization (T/O) change. A Table of Organization Change Request (TOCR) must be submitted with the POI to CG TECOM G-1 requesting a T/O change.

22. School Overhead Requirements. School overhead requirements reflect the total personnel overhead requirement for the entire school with the same fields identified in para (21) above (i.e. personnel detailed to support of that POI full-time, yet not in contact with students).

23. Training/Education Support Requirements. This field lists resource requirements other than personnel. It will identify all requirements, but specifically emphasize the portion that exceeds current availability (e.g. facilities, equipment).

24. Task List. This field reflects an itemized list of all current and approved T&R events associated to the POI. Relevant comments can be included in the Task List Notes to provide amplifying information (i.e. downgrade justification for applicable TLOs, Values Based Training/Leadership requirements).

(6) Section II (Summary of Hours). Formal Schools will determine and record the appropriate amount of academic and non-academic time necessary to meet the learning requirements of the POI. Annexes A-Y are for academic concept cards and Annex Z is reserved for administrative concept cards. The non-academic time in this context is recorded as administrative time. Due to automatic calculations of academic and administrative time from each concept card in MCTIMS, 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).

(a) Academic Time. Time required to transfer learning objective based instruction, outcome based instruction, lesson purpose instruction, or evaluating performance. The minimum peacetime course day is 8 hours. The minimum peacetime course week is 40 hours (8 hours a day multiplied by 5 working days). The minimum amount of daily academic time is 7 hours. If the training day exceeds 8 hours, only 7 hours can be associated to “new” not previously taught material.

1. Training/Calendar Day Calculations. All time (academic and non-academic) related to training, must be accounted for in training days and, consequently, in the calendar days of the course. The guidance contained in this handbook does not preclude schools from exceeding the 8-hour training day to accommodate field training time, operations under reduced visibility, admin time required for weapons cleaning, etc. Schools must continue to emphasize efficiency and effectiveness of training to minimize Transient, Training, Patients, and Prisoners (T2P2) to the greatest extent possible. NOTE: The guidance for 8 hour minimum does not provide license to those legacy courses that currently have training days in excess of 8 hours on average to request an increase in the duration of the course.

a. Estimate Average Length of a Training Day. The calculation is the total academic hours divided by training days (Figure 6-3). If comments are required, the Formal School will input them under CDD Notes.

Example 1:	Example 2:	Example 3:
POI Academic Hours: 322 POI Training Days: 46	POI Academic Hours: 322 POI Training Days: 35	POI Academic Hours: 322 POI Training Days: 52
322/46 = 7 ✓	322/35 = 9.2 ✓	322/52 = 6.2 ✗
Good	Requires Comments	Kick-back

Figure 6-3.--Estimate Average Length of a Training Day

b. Estimate Duration of Training Days. The calculation is to add academic hours + non-academic hours then divide by POI training days (Figure 6-4). If there are insufficient academic and administrative hours for a course to have at least 8 hours a day, then the duration of the course must be shortened by the number of days that will result in a minimum of an 8-hour day.

Example 1:	Example 2:	Example 3:
POI Academic Hours: 322 POI Non-Academic Hours: 46 POI Training Days: 46	POI Academic Hours: 322 POI Non-Academic Hours: 100 POI Training Days: 46	POI Academic Hours: 322 POI Non-Academic Hours: 23 POI Training Days: 46
322+46 /46= 8 ✓	322+100 /46= 9.2 ✓	322+23 /46= 7.5 ✗
Good	Good	Kick-back

Figure 6-4.--Estimate Duration of Training Days

c. Estimate Total Training Days. The calculation is calendar days divided by 7 then multiply by 5.

d. Estimate Total Calendar Days. The calculation is training days divided by 5 then multiply by 7. The calendar day field is a free text area of the CDD and must be entered manually. The date must match the whole number of days between the report date and the graduation date. During certain parts of the year, the actual number of calendar days of the course may be somewhat in excess of the stated number of calendar days because of holidays or weather related delays. Figure 6-5 provides examples of how to estimate both total training days and total calendar days.

Example 1:	Example 2:	Example 3:
POI Training Days: 32 POI Calendar Days: 45	POI Training Days: 42 POI Calendar Days: 59	POI Training Days: 106 POI Calendar Days: 148
(45/7) x 5 = 32.1 T days (32/5) x 7 = 44.8 C days	(59/7) x 5 = 42.1 T days (42/5) x 7 = 58.8 C days	(148/7) x 5 = 105.7 T days (106/5) x 7 = 148.4 C days
Good ✓	Good ✓	(≤139 = TECOM funded TAD course) Kick-back ✗

Figure 6-5.--Estimate Total Training/Calendar Days

(b) Non-academic Time. Unless otherwise noted below, non-academic time is not calculated in Section II of the POI. Non-academic time refers to time, other than academic and administrative, that instructors are in contact with students as required by CG TECOM directives, various Marine Corps Orders, and the POI. It can include, but is not limited to: Physical Training (exceptions see subpar 2. below), Chow, Equipment Draw/Issue, Transit, Field day, Overnight Duty, and Remediation.

1. Administrative Time. Time required in the POI to complete administrative tasks necessary for the smooth functioning of the course. All administrative hours will be distributed across the number of training days thus calculated. Instructors must be present during Administrative Time, but there is no requirement to prepare course materials. Administrative time can include, but is not limited to: checking in/out, graduation practice/graduation, specialized uniform/equipment fittings, medical appointments, weapons cleaning, etc.

2. Physical Training. Physical training will only be considered academic time when the specific physical training event has a learning objective(s) based on the ITEs derived for the same T&R Manual that provide the other ITEs for the course. As with the other events in that POI's task list, the physical training event must be instructed and evaluated. Physical training in all other cases may be conducted at the discretion of the CO as non-academic time. Physical training as non-academic time should be scheduled whenever possible so it does not interfere with the minimum 7 hours of academic time each day.

(c) Lesson Purpose. A Lesson Purpose class presents material that, while important, is not associated with learning objectives of a specific individual or collective training event and is not testable. Instructional hours not supporting the instruction or evaluation of course learning objectives is known as lesson purpose time and should be avoided to the greatest extent possible. Formal Schools should strive to meet the goal of no more than 1 hour of lesson purpose time a week so as to remain focused on instructing and evaluating the learning objectives of the course. If more lesson purpose time is necessary, Formal Schools may justify additional hours at POI submission with the task analyst.

(7) Section III (Scope of Annexes). This section carries a subheading, academic subjects, and details a description of the scope of each annex and any learning outcomes 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.

(8) Section IV (Concept Cards). This section comprises the bulk of the POI and provides 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. TLOs will only appear on a concept card for a lesson or exam during which students will actually be exposed to or perform the actual TLO. Exception: Courses that do not involve the expenditure of ammunition may include the parent TLO on every concept card that features a child ELO.

(9) Section V (Student Performance Evaluation). This section documents the scope of the evaluation, standards for successful performance, and 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 (i.e. recycle/MOS re-designation procedures). Learning objectives can be evaluated using two primary methods: performance and written. However, some learning objectives do not lend themselves to these types of evaluation, which are identified below. The Formal School’s Academic SOP will also provide guidance on specific evaluation procedures.

(a) By Exception. In this case, it would be appropriate to determine whether or not they should be considered to be a learning outcome vice learning objective. A “by exception” event could relate to ethics or values. An example would be a guided discussion or during another venue in which an instructor introduces values topics and encourages student feedback. They could be evaluated based on the student’s ability to show understanding of DOD and Marine Corps policies. Students' expressed opinions, views, and religious beliefs are not to be considered as part of an evaluation.

(b) Remediation. Remediation is neither academic nor administrative time and must be conducted after-hours. Scheduled review sessions may be included in the examination time provided all students are involved; however, individual remediation will not be captured in the POI.

(c) Downgrade Justification. Includes list of downgraded events with justifications.

(10) Section VI (Distribution List). Although reference (b) identifies the distribution list as part of the POI, access to electronic versions of POIs in MCTIMS have resulted in this section being obsolete and no longer required. It will not appear in MCTIMS or the POI Checklist.

5. Conduct a Risk Assessment (RA). The Formal School conducts an RA on all events, lessons and exams. The concept of Risk Management (RM) formalizes the process of training safely and efficiently. Rather than relying solely on individual experience to achieve the best results, RM provides careful analysis and control of hazards in each lesson. Refer to reference (b) for RM and High Risk Training (HRT) procedures and requirements.

6. Develop Lesson Materials. Curriculum developers must generate lesson materials that will 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 learning setting to the job. Relevance often increases the student's motivation to learn and retain those skills that will help in the performance of the job. The following steps are used in the development of lesson materials.

a. Gather Resources. The development of lesson materials begins with gathering instructional and subject specific resources necessary for developing the lesson. 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 method(s) to use, how much time is allowed for each method, the type of media, S:I ratio, and other notes regarding the lesson. In addition to the concept card, the LAWs, 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 generated materials meet the intended lesson goals.

b. Write a Lesson Plan. The lesson plan is a comprehensive document that details the strategy to be used in teaching the content that supports the learning outcomes/objectives. Its contents will include the information required for the academic faculty to facilitate the class and aid the students in their learning. Before learning the mechanics of writing a lesson plan, it is important to understand the function and components of the lesson plan. All Formal Schools will use the TECOM approved lesson plan template located on the TECOM MTESD Sharepoint site. Appendix D provides the URL to access the lesson plan template.

(1) Functions of a Lesson Plan

(a) Script. The lesson plan 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) Standardization. The lesson plan establishes continuity and standardization of instruction so the same information is taught every time.

(c) Historical Document. The lesson plan provides a historical document of what has been taught at the Formal School.

(2) Components of a Lesson Plan

(a) Title Page. The title page is the cover sheet for the lesson plan. It 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.

(b) Introduction. The introduction is written to gain the attention of the student at the beginning of the lesson and to provide an overview of what the student can expect in relation to the lesson. 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. By providing the relevance and intent of the lesson, the attention of the students is gained.

The introduction can be written so that it contains the Gain Attention, Overview, Learning Outcomes (as required)/Learning Objectives, Methods/Media, Evaluation, Safety, and Transition utilizing the acronym GOLMEST.

(c) Body. The body is outlined and written so that a conceptual framework is established. This framework establishes the main ideas and the sequence in which they will be introduced. When writing the body the curriculum developer establishes and sequences the main ideas, inserts content, provides examples, determine placement of methods, and inserts methods. Main ideas should correspond to the ELOs (e.g. main idea #1 is ELO #1, main idea #2 is ELO #2, etc.).

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

(e) Transitions, Instructor Notes, and Cues. Transitions tie together the different components, methods, and main ideas within the lesson by smoothly summarizing one main idea and introducing the next. Instructor notes include information pertinent to the conduct of the lesson and can appear throughout. Cues are used to assist the instructor in maintaining awareness throughout the conduct of the lesson (e.g. time, media, breaks).

(f) Lesson Plan Cues. There are three types of cues contained in the lesson to assist the instructor with the presentation of material. All cues must stand out from the regular text of the lesson.

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

a. Main Headings. Time cues for main headings (e.g. Introduction, Body, Summary) are placed right justified of the heading. The cue is bold, capitalized, and in parenthesis. The main heading time cues add up to the total lesson time on the concept card. Figure 6-6 provides an example of how the combination of main headings equal the total lesson time.

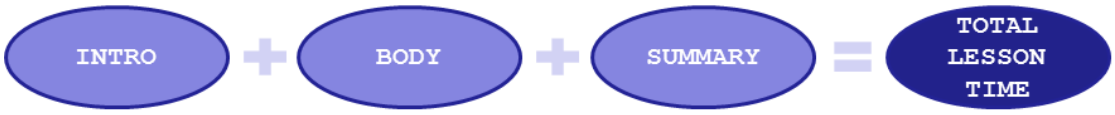

Figure 6-6.--Total Lesson Time Cue

b. Main Ideas. A main idea time cue reflects an accumulation of any and all methods of employment taught within that main idea as well as all break cues within that main idea. Main idea time starts with a main idea and ends with the start of the next main idea or when the summary is reached. When all main idea time cues are added together, this total time must match the main heading time cue for the Body. Time cues for the main ideas within the body of the lesson are placed two spaces after the main idea, bold, natural-cased text, and in parenthesis. Figure 6-7 illustrates how the main ideas equal the body of the lesson.

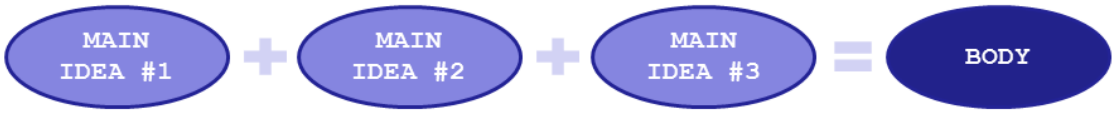

Figure 6-7.--Body of a Lesson Time Cue

c. Methods. The time allotted for a particular method (e.g. demonstration, practical application, case study) is explained within the method instructions and must match the method time on the concept card. If a method is not within a main idea, then it has its own time cue. Figure 6-8 provides an example of how various methods combine to equal a main idea.

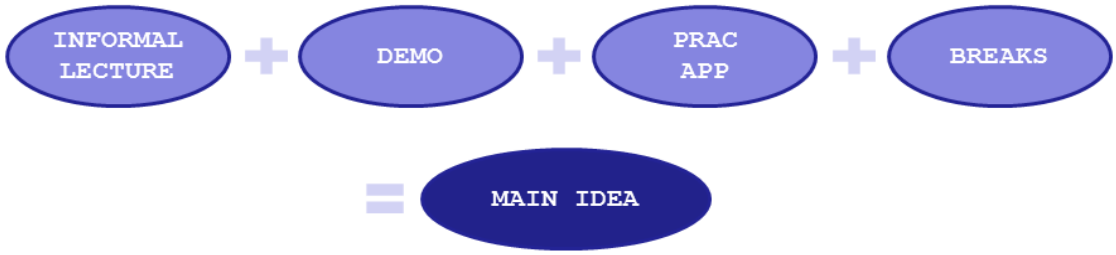

Figure 6-8.--Main Idea of a Lesson Time Cue

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 media at a specific point in the lesson.

3. Break 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 50 minutes of instruction. An activity (e.g. practical application) can be inserted to regain the students' attention to the subject material after the break. Remember, it is important for the instructor to summarize information through a transition from day-to-day, lesson-to-lesson, and before and after breaks so the flow of instruction is not disrupted. A break cue time is not counted as a separate time cue; it is counted as part of a main idea or summary. Figure 6-9 provides an example of how to calculate the summary time cue.

Figure 6-9.--Summary of a Lesson Time Cue

c. Review Lesson Plan and Risk Assessment Worksheet (RAW). Compare the lesson plan with the RAW to ensure that all hazards have been identified and that the controls have been integrated into the lesson plan.

d. 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.

(1) Student Outline. The student outline provides the student with a conceptual framework that highlights the main ideas of the class. It should contain the learning objectives, lesson outline, and any references used to build the lesson. It should also include any additional notes or information deemed necessary (e.g. graphics, charts, graphs, clip art, photos, diagrams).

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.

(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 materials other than the student outline, such as advance handouts, answer keys to quizzes, additional articles for reading, or reference materials. 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 aides. The distinction is made relative to ownership. Supplemental student materials will be items that students are able to take with them following the class. Instructional aides 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/learning outcomes being taught.

7. Instructor Preparation Guide (IPG). The IPG is a required element of the 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. Instructors can utilize the IPG Checklist to check off items when preparing for the lesson. IPGs will contain, at a minimum, the following components to assist in preparing for instruction.

a. Lesson Title. The lesson title is provided to identify the lesson. This can be found on the concept card.

b. Lesson Designator. The lesson designator is provided to identify the lesson. This can be found on the concept card.

c. Total Lesson Time. Refer to the concept card for the total lesson time. The main heading time cues add up to the total lesson time on the concept card. This provides the instructor with the amount of time that he/she has to teach the lesson. Figure 6-3 provides an example of how the combination of main headings equal the total lesson time.

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

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

f. Personnel Required. List all personnel that will be required to implement the lesson (e.g. instructors, support personnel, corpsman). Confirm this information with the S:I ratio and notes on the concept card.

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

h. Review Course Materials. Review the course materials to identify any potential problems prior to instruction. Review the course/training

schedule, administrative requirements, student background information, lesson plans, student materials, media, and evaluations.

i. Personalization. Add personalization to the lesson plan. Personalize the lesson plan by adding subject matter detail, relating personal experiences, providing examples, and/or interactive techniques.

j. Materials/Equipment. All materials and equipment needed to conduct the lesson are listed so that the instructor can gather materials well in advance of the lesson. Materials may include location of MLF documents (e.g. media, lesson plan, student outlines), models, mockups, or audiovisual equipment.

k. Exercise Setup and Planning. Each exercise (e.g. demonstration, practical application) is listed here. A description of the setup and planning is provided beneath the category sequentially.

l. Safety. The RAW is a required element of the MLF and must be reviewed by the instructor. The actions, required by the RAW, that mitigate the risks associated with the activity are listed here. It may also require that the instructor reassess the environment for changes (e.g. weather, worn equipment) and report findings on the After Instruction Report (AIR).

m. Other Possible Items. Additional items can be added if deemed necessary.

n. Approving Signature and Date. A space is provided for the designated approving authority’s signature and date. The Formal School’s Academic SOP should dictate who approves the IPG.

8. Construct Assessments

a. Types of Assessment. Reference (r) provides in-depth information on how to break down intangible concepts into measurable components and to better target and frame measurement tools. This reference is used continuously throughout the majority of this chapter to provide up to date research that supports and validates assessment methods.

(1) Formative Assessment. Instructors use formative assessments during the learning process to gauge student progress, modify teaching and learning activities, and improve learner achievement. Students who complete formative assessments during a course learn to recognize and correct their errors as they build deeper knowledge and stronger skills. In fact, the actual scores earned on formative assessments do not need to be officially recorded, since performance on formative assessments is used to provide feedback rather than track student outcomes.

(2) Summative Assessment. Summative assessments are formal tests used to measure cumulative learning outcomes/objectives, such as at the end of a course. There are two separate approaches to how summative assessments can be used. The first is a mastery learning approach. In this approach, the amount of time and type of instructional activities varies from student to student, but the outcome performance levels remain constant. Whereas in more common instructional models, learners are given the same amount of time and often the same instructional interventions, but their achievement levels vary. Regardless of which approach is used, instructors should use formative

and summative assessments to measure, and when necessary, guide the remediation of students.

b. Creating Assessments. Difficulty in assessing abstract concepts often arises because the concept being measured is not well defined. When creating an assessment, it is important to be as precise as possible when you define your assessment goals, learning objectives, and performance criteria. Note that assessments may be used for a variety of reasons — they are not just for assigning grades.

(1) Identify the Assessment's Purpose. What is the intended value of the assessment process, and how will you determine if your assessment achieved its goal? Reference (r) outlines several reasons for using more objective assessments, such as setting a baseline, checking compliance, and assigning a grade. In addition, it also provides reasons for using potentially less objective methods of assessment, such as establish a context, checking the student' general outlook, and enhancing the students' learning. This emphasizes the importance of understanding how learning objectives support learning outcomes.

(2) Identify Assessed KSAs. First, think about the topic of the assessment in a notional way. Ask yourself, "What does _____ mean, and why is it valuable?" Fill in the blank with the general goal of your assessment. For instance, if you are assigning an end-of-course grade, then ask yourself, "What does successful completion of this course mean and what is the real-world value of learning this curriculum?"

(3) Break KSAs into Smaller Pieces. Identifying appropriate and manageable KSAs is critical to the success of the assessment. After determining the purpose and general topic of an assessment, you may need to break the topic into smaller, more manageable subcomponents.

(4) Identify an Appropriate Measurement Method. At this point, you may already have a measurement approach in mind. If not, think about these additional considerations:

(a) What are the learners' skill levels?

(b) How much class time is available to administer an assessment?

(c) How much of your time available for grading?

(d) Do any relevant resource limitations exist?

(5) Develop the Assessment Instrument. An assessment is typically a mix of objective and subjective components. Assessing student performance may seem entirely objective when using techniques like multiple-choice tests, but even such apparently objective approaches are based on experts' opinions and assumptions. These opinions and assumptions may have an effect on constructing questions, scoring free response items, creating rubrics, grading participation, or interpreting scores. Subjectivity in an assessment is not a bad thing, but instructors and curriculum developers should understand the influence of their own biases when designing and evaluating assessments and interpreting their results. Paragraph (c) below provides examples of the most common assessment instruments used in today's learning environment.

(6) Define Performance Standards by Expertise Levels. Measures of student performance should reveal the stage of expertise at which the student is functioning. To do this, first create a list of possible skill levels, from novice to expert. Then define the performance standards for each level. Well-defined performance standards should reveal specific proficiency gaps, show steps for improvement, and support the delivery of targeted feedback. As identified by reference (r), below are the five stages of development that support student assessment.

(a) Novice. Rigidly follows rules without independent judgment.

(b) Advanced Beginner. Treats each step separately, no prioritization.

(c) Competent. Can perform multiple activities towards a goal.

(d) Proficient. Has holistic view, prioritizes tasks, adapts as needed.

(e) Expert. No longer relies on rigid rules, understands intuitively.

(7) Develop a Plan for Feedback. After students complete an assessment, the instructor should provide feedback about their performance. Scoring students (e.g. 90% or A–) and showing them the correct answers is useful, but not always sufficient. In order to motivate students and advance their learning, good feedback should reveal the specific gaps or misconceptions that students possess, directly address these gaps with meaningful feedback, and provide examples of better performance.

c. Assessment Instruments. The assessments that were created during the Design Phase can be “stacked” or “combined” in order to develop comprehensive instruments that are observable using learning objectives driven instruction. When using these instruments, curriculum developers and instructors should ensure the testing speed, grading speed, breadth, depth, and objectiveness are considered prior to determining which instruments are the most appropriate.

9. Construct Tests. Many common tests measure only lower-level skills and their associated mental processes, such as knowledge acquisition, comprehension, and basic application. For instance, tests often only measure recognition (i.e. select the right vocabulary word from multiple-choice options), recall (i.e. give a short definition), or basic procedural application (i.e. correctly order the steps associated with a given task). These types of traditional tests rarely ask students to apply information or to exhibit achievement in cognitive ways, such as complex reasoning and self-awareness. Therefore, education researchers strongly advise academic faculty to devise tests that target traditional knowledge and higher-order thinking. Integrating higher-order assessment methods with traditional knowledge tests allows the instructor to evaluate how a Marine would perform in more realistic, real-world settings, in addition to evaluating how much each student has learned in a more traditional sense. When constructing tests, curriculum developers and instructors should reference the Test Checklist and Test Item Checklist located on the TECOM MTESD Sharepoint site. Appendix E provides the URL to access these checklists.

a. Test Methods

(1) Knowledge-Based Test. As discussed in Chapter 5, 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 schools to administer knowledge tests: time, cost, safety, and resource constraints that do not always permit performance-based testing. The most frequently used knowledge-based evaluation methods are identified in Appendix A.

(2) Performance-Based Test. This evaluation deals with the assessment of technical skills, usually physical/motor skills that follow a sequence of steps (process) or produce an end result (product). A performance-based test duplicates the actual behavior by using the same equipment, resources, setting, or circumstances that the student will encounter on the job. The test will typically have a checklist, or a similar measurement tool such as a rubric, 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 NAVMC Form 10274 (Administrative Action) is a valid performance test for a student who actually conducts that task on the job. The most frequently used performance-based evaluation methods are identified in Appendix B.

b. Test Categories. Below is not an all-inclusive list, but rather the most common categories of testing Marines in a Formal School setting.

(1) Criterion-Referenced Test. Criterion-referenced testing is typically the method for testing learning objectives taught in the Formal School setting. 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 (e.g. rubric) 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.

c. Testing Intervals. A student's knowledge and skill level can be tested at different intervals before, during, and after instruction. A pre-test, progress test, and a post-test accomplish this.

(1) Pre-test. A pre-test is administered to students prior to entry into a 2000-level course 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. The determination of whether a subject is taught to standard or can simply be refreshed must be informed by how well the students did on the pre-test, not just whether or not they passed the pre-test. Example: A pre-test may reveal that incoming students have in-depth knowledge of M16 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 LOs/Learning Outcomes.

(3) Post-test. The purpose of post-tests 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.

d. Steps for Constructing Tests. After the test items are written, the challenge now is to properly assign and arrange test items, determine the grading criteria, develop the scoring method, and develop testing instructions.

(1) Determining Mastery. 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). 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 may receive remedial instruction and retesting until they reach the standard for mastery. The Formal School will establish the remediation policy based on school resources (e.g. 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. 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. Mastery of the course may be further defined by the Formal School's Academic SOP.

(2) Assigning Written Test Items. When determining what test items to use, the idea is to measure all learning objectives. Formal evaluation is accomplished by testing each learning objective. Informal evaluation is accomplished through class work, homework, quizzes, and practical application. 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. For example, high criticality is used during job performance; moderate criticality influences job performance; low criticality has little influence on job performance.

(b) 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.

(c) Complexity of the Material. The more complex the material, the more test items are required to ensure understanding.

(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.

(e) Other Criticality Factors. Refers to a learning objective's importance as related to the performance of a job task.

1. Safety to personnel/equipment. Critical tasks are those which are considered high risk or dangerous.

2. Frequency of performance. The more often a task is performed, the more critical it becomes.

3. Importance to on-the-job performance.

4. Importance to the overall course outcome.

(3) Arranging Test Items. When making decisions on how to arrange test items, consider the following:

(a) Placement. Test items should be placed on the page so each item stands out clearly from the others. For example, a true/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.

(b) Arrangement. 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 increasing 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 a test:

1. Space items for easy reading and responding.

2. Provide generous borders.

3. List alternative responses vertically beneath the stem.

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 objective 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. Norman E. Gronlund. p. 122.

Figure 6-10.--Evaluating the Assembled Test

(4) Developing Grading Criteria. Describes 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-based test.

(a) Uses of criteria. Enables the instructor to determine whether or not the student/group has met the objective/outcome. Additionally, it provides an appropriate 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. A PECL or rubric is appropriate grading criteria for a course that is graded Mastery or Non-mastery. If the course is graded with a numerical grade, a rating scale may

be the most appropriate to use. When defining the 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 complete the behaviors are described, the more effective the 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 MCTIMS to support situations where both forms of testing are needed. 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 to complete 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 should 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. Some schools utilize bubble sheet scanning devices to do automated grading. Schools that have automated classrooms have the option to use MCTIMS Question Mark Perception (QMP) for automated testing and evaluation. Once the test is complete, grades are automatically imported into the Student Evaluation Module (SEV).

(6) Test Instructions for the Student. Once the desired test items are prepared, a complete set of instructions, either written, oral and/or by visual aid, must be given to the student. Further information on student instructions may be delineated in the Formal School’s Academic SOP.

(7) Test Instructions for the Test Administrator/Proctor. Specific instructions should be standardized across the instructors at a Formal School. These should also be outlined in the Formal School’s Academic SOP.

10. Conduct Validation. Validation is a process for 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 should be revised until it does.

a. Methods of Validation. There are a variety of methods for validating instruction. Validation of instructional materials should involve as many

methods as possible. If multiple methods are to be used, they should be conducted in the order in which they are presented below. Academic faculty members should work in conjunction with curriculum developer(s) to conduct the validation to enhance objectivity.

(1) 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.

(2) 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. 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.

(3) Pilot Course. Formal Schools are provided the opportunity to run pilot courses to validate the instruction, particularly the instructional methodologies and amount of time assigned to concept cards. However, the decision to use a pilot course as a validation method is based on resources, the availability of the necessary members of the target population, and time. 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, then that is the environment in which the trials should be conducted. Pilot courses are not meant to be conducted in multiple iterations, but rather as a test bed for the validity of a POI prior to submission for approval.

(4) 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.

b. Types of Data. Formal School faculty should determine which data is the most significant to the learning environment in order to support their Formal School Evaluation Plan. The following are types of data gathered during validations.

(1) Data Collected from Students. Student data is 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.

(2) Instructional Material Data. Information on the effectiveness of the instructional material should be gathered from instructors, SMEs, students, and curriculum developers.

(3) Instructional Procedures Data. Data on the effectiveness of the teaching methodologies (instructional methods and media) should be gathered from instructors, SMEs, students, and curriculum developers.

(4) Test Item Data. During validation, test items should be analyzed for validity to determine if they measure the KSAs required of the learning objectives and 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 and can assist in determining which test items need to be revised or rejected. It is critical to conduct test item analysis during validation prior to course implementation to ensure that the test items are valid.

c. Steps for Validating Instruction

(1) Review Formal School Academic SOP. The information needed to plan validation may be contained in the Formal School 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 and the type of validation methods are determined.

(3) Determine Data Collection Procedures. Once the validation method is selected, determine the system for collecting data. This data may be collected using surveys, questionnaires, interviews, group discussions, observations or other methods. Open-ended questions should be asked, so that participants can genuinely express their feelings, opinions, and perceptions of the effectiveness of the instruction. Keep in mind that the purpose of validation is to obtain information that will improve instruction.

(4) Implement Validation Plan. Using the validation methods identified above, conduct the validation in an appropriate manner.

(5) Interpret and Record Validation Results. 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.

(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 needs

revision. Report the validation results to the validation authority for approval.

d. Validation Authority. The responsibility for validation of instruction ultimately rests with the Formal School CO/OIC/DIR. The CO/OIC/DIR provides guidance through a validation plan, usually found in the Academic SOP. The plan will identify who has validation authority. For example, the following decisions concerning validation should be made by the Formal School:

(1) What personnel are available to conduct the validation (e.g. SMEs, instructors, curriculum developers)?

(2) How many methods of validation will be used in validating course material? What specific revisions to instructional materials can be undertaken and still meet the planned course schedule?

(3) How do we obtain members of the target population for validation? If actual members of the target population are not available, then the CO/OIC/DIR should select individuals with backgrounds as similar as possible to those of the desired target population.

(4) 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.

(5) Should the students as part of a pilot course get a diploma? This cannot be answered by the Formal School. Rather, the recommendation would be forwarded to TECOM MTESD for determination based on a variety of factors (e.g. MOS producing).

11. Assemble a Master Lesson File (MLF). An MLF is a compilation of living documents that are kept in the school to provide everything needed to conduct a lesson. 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 methodologies, or other rationale determined by the academic faculty. 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. Schools can maintain MLFs in either an electronic or paper-based format; however, during IG inspections it is up to the inspector as to which format will be used for the inspection. In addition, the most up to date MLF must be uploaded to the MCTIMS Training Resource Module. The below items are necessary to complete an academic MLF. In a lesson purpose class, the first two items are omitted.

a. Learning Analysis Worksheet (LAW). Documents the transition between T&R events and learning objectives.

b. Learning Objective Worksheet (LOW). Describes the anticipated learning outcome, provides a measurement for each learning objective, and contains test/evaluation items and selected methods and media for that specific learning objective.

c. Concept Cards. Identify all learning objectives, instructional methods and media, and the resources required to conduct an entire lesson, exam, or event.

d. Lesson Plan. The lesson plan should contain the required elements and be an effective preparation tool for the academic faculty to facilitate the period of instruction.

e. Student Outline. If a student outline is utilized in the class, a master copy will be maintained in the MLF.

f. Media. Media and/or a list of supporting materials are placed in the MLF. If the actual media are not contained in the MLF, then supporting documents that list the media and its location should be included. Any copyright authorizations related to the media should also be filed here.

g. IPG. This document is used to guide the instructor in preparing for the lesson.

h. RAW. The RAW documents the school plan to conduct training in the safest manner possible. The RAW documents the five-step RM process as it relates to the lesson.

i. Supplemental Student Materials (if applicable). 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.

CHAPTER 7

IMPLEMENT PHASE

1. Introduction. The purpose of the Implement Phase is the effective and efficient facilitation of instruction to promote student understanding of material, achieve student mastery of learning objectives, and ensure a transfer of student knowledge and skills from the learning setting to the job. This is accomplished by effectively implementing the curricula that was designed, developed, validated, and approved during the previous phases. Figure 7-1 illustrates the inputs and outputs of the Implement Phase.

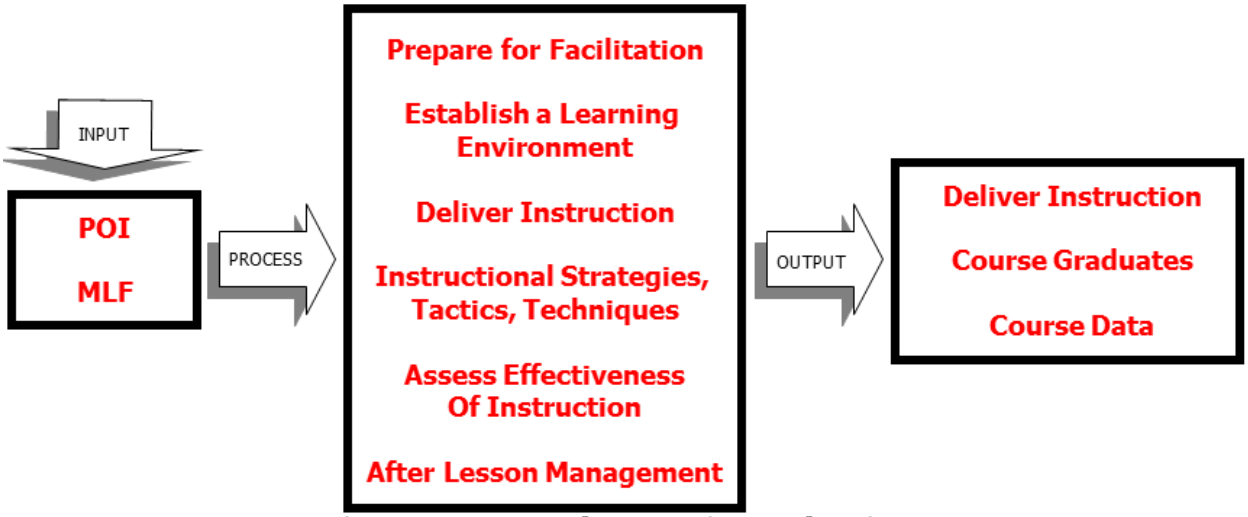

Figure 7-1.--Implement Phase Flowchart

2. Prepare for Facilitation. Effective planning involves variety, gradually increasing complexity, and tailoring instructional tactics to the students. The preparation portion of the Implement Phase involves all those activities that academic faculty and support personnel must perform to get ready for facilitating instruction. Prior to teaching, instructors should thoroughly understand the role of the course within the institution's progression of instruction and anticipate student characteristics and questions in order to properly facilitate student learning.

a. Review Course Schedule. Academic faculty 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 (e.g. ranges, weapons, or transportation), rehearsals (e.g. a dress rehearsal), and any administrative requirements (i.e. printing of student materials).

b. Review Teaching Materials. Instructors must have a clear understanding of all aspects of the lesson. This is accomplished by reviewing the course schedule, MLFs, examinations, etc. By reviewing teaching materials, 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. Lastly, the instructor must ensure the lesson plan, student materials, and media all have the same information.

c. Review Student Materials. Student materials assist the instructor by providing tools that stimulate the learner and reinforce key concepts. The instructor must ensure that all materials required by the students are available, in good condition, and ready to be distributed. There are two types of student materials; student outlines (primary documents that support the instruction) and supplemental student materials (something other than the student outline that is retained by the student after being taught). All student materials must be reviewed to ensure they match and support the lesson. Using outdated and irrelevant material must be avoided at all cost. The learning sciences have proven that student performance and motivation are reduced when knowledge and skills are received that no longer pertain to the job.

d. Review Lesson Plan. Detailed lesson plans ensure that faculty members have all the critical information needed to maximize student learning. The purpose of reviewing the lesson plan is to ensure 1) it contains all of the required components, 2) the learning objectives match the information in the lesson plan, and 3) the lesson plan is personalized to the instructor's style of facilitation. After reviewing the lesson plan, the instructor should fully understand the lesson content and have confidence in the material in order to allows for the smooth and effective facilitation of instruction.

e. Review Media. Instructional media can come in many forms. The primary purpose for reviewing media is to ensure that it matches the information in the lesson plan and will aid in the student's ability to master the learning objectives.

f. Review RAW. The purpose of the RAW is to record the results of a RA. During the Develop phase, a RAW is developed and then maintained in the MLF. A RAW is required for every lesson. However, some lessons may not have any identified hazards, in which case the RAW will state "No Identified Hazards." Through the RA, identifiable hazards are listed and 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 RA and review it for safety issues pertaining to the lesson prior to the conduct of the lesson. The RA must also contain the Cease Training Criteria (CTC) for the lesson. The CTC details the circumstances when training must be stopped and is specified in the safety brief of the lesson plan introduction. When there is CTC associated with a practical application or other method, it is reiterated prior to the practical application. For each safety control identified on the RAW, 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. The RAW should be current and relevant based upon the approval signature and date. Any problems concerning the RAW, such as acquiring resources necessary to implement controls, must immediately be brought to the attention of the appropriate authority.

g. Review IPG. The IPG provides 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 in which items can be checked off when preparing for the lesson.

h. Review Student Evaluation Method. The primary purpose is to ensure the instructor has a complete understanding of how the students will be evaluated. By reviewing the appropriate method, 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.

i. Adapt Teaching Materials. The instructor will be provided with the approved lesson plan for the course of instruction and is allowed the flexibility to adapt the teaching materials, tailoring them to his or her style of teaching. Lesson plan personalization allows the facilitator 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.

(1) 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.

(2) Instructional Techniques. Use carefully written questions, well-planned media, or additional activities to enhance the lesson.

(3) 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.

(4) 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 waves travel through water after a stone is dropped,” will help them understand.

j. Conduct Rehearsals. The success of any presentation is a direct result of the amount of work that went into preparing for it. Rehearsal is the process in which an instructor practices delivering a 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 student learning. Rehearsal also provides the instructor a gauge of how his or her facilitation fits the allocated time for the lesson. 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. It is strongly recommended to record rehearsals when possible.

(1) Individual Rehearsal. 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.

(2) 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. The instructor should be prepared to accept constructive feedback from the audience.

(3) Dress Rehearsal. 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 learning 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.

k. Plan Administrative Functions. There are several administrative functions the instructor must address prior to teaching. The instructor should verify the time and location of the class and obtain a class roster. Arrangements must be made for monitor/visitor seating in accordance with the local SOP. In addition, the instructor needs to ensure appropriate security or safety measures have been followed and that all administrative paperwork has been prepared to facilitate the instruction.

l. 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 lesson.

3. Establish a Learning Environment. The learning environment refers to the physical conditions and surroundings in which a job is performed, or in which learning takes place, including tools, equipment, and job aids. Prior to teaching, the instructor must set and maintain the conditions of the learning environment in a manner that promotes a positive, respectful, engaging, and motivating atmosphere that encourages active collaboration by managing time, the physical space, and student behavior.

a. Set Learning Environment Conditions. The instructor must ensure that the learning environment is conducive to learning by replicating 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.

b. Prepare Media and Instructional 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, or computers. Media can include board media (e.g. dry erase boards), established media (e.g. actual item/object, printed materials), computer media (e.g. tutorials, CBT), Interactive Media Instruction [IMI]), and multimedia (e.g. computer aided graphics, audio, video).

c. Brief Augmented Support Personnel. Augmented support personnel are not required to be certified instructors, but are directly or indirectly involved in the presentation or support of teaching. They are typically used as training aids and can be categorized as assistant instructors, demonstrators, role players, corpsmen (when applicable), etc. The instructor should brief all augmented personnel so that each person’s role is clearly understood. Some personnel may need to be at the location early to secure and set up equipment or to have student materials in place prior to the start

of the class. Demonstrators should be briefed on their roles and if time permits, a walkthrough of the demonstration should be conducted prior to instruction. Additionally, the learning objectives of the lesson and any needed preparations for teaching should also be briefed.

4. Deliver Instruction. Instructors should clearly, concisely, dynamically, and interactively exchange information to develop student knowledge and promote understanding, using a combination of verbal, nonverbal, and visual communication approaches. As noted in Chapter 6, GOLMEST should only be used as a method when organizing a lesson or with inexperienced instructors to be able to have as a framework for introduction, whereas a more experienced instructor will not require such a rigid framework to their teaching.

a. Quality of Instruction. Per reference (q), the SUDM initiative emphasizes four themes that Marine instructors should actively integrate into all aspects of their duties.

(1) Great Instructors are Great Leaders. Great instructors set big goals for their students and develop these goals with their students in mind. They adapt instruction to meet the needs of the Marines and guide learners to stay focused on activities that lead to accomplishment of goals. Great instructors teach at the frontier of student ability and help students to visualize success on a grand, but achievable, scale. They acknowledge obstacles to success, demonstrate determined resolve, and communicate a clear plan to overcome any challenges.

(2) Great Instructors Communicate. Great instructors communicate clearly, with an intentional purpose in mind; they tailor their communication style to the needs of their audience and the nature of the message. They ask frequent questions, continuously dialog with Marines, and deliver timely, effective feedback.

(3) Great Instructors Employ Expert Techniques. The best instructors have a “bag of tools” that contains a wide array of instructional methods, communication approaches, and assessment techniques drawn from classroom experience and best practices. If one strategy fails to achieve desired outcomes, great teachers are prepared to employ alternative approaches.

(4) Great Instructors have Character. Sustained energy is required to reach ambitious goals. Great instructors work tirelessly, against all odds, refusing to surrender, even if the challenges are substantial. By modeling their willingness to fully commit their time, comfort, and energy to achieve all established learning goals, instructors convey a mindset of relentless determination that Marines are inspired to emulate.

b. Effective Communication. How an instructor presents information can influence student understanding, retention, and ultimately, on-the-job performance. When delivering instruction, the instructor should adhere to the following effective communication guidelines to ensure maximum transfer of knowledge and skills to the students.

(1) Communication Process. There are various communication techniques that instructors can skillfully employ in the classroom; some of the most common are verbal, nonverbal, listening, and questioning. These techniques dramatically affect the student’s ability to master learning objectives and the instructor's ability to maintain student attention.

(a) Verbal. Verbal communication is obviously the most common to a student. What is important to note, however, is that an instructor can have the best lesson plan ever created, but if he/she cannot articulate properly and deliver the lesson in a way that the students can understand, then learning will not transfer and the instructor has failed. There are eight common speech techniques that instructors should be cognizant of when speaking: volume, rate, dialect, pronunciation, articulation, force, inflection, and pause. An instructor can research these techniques to have a better understanding of how and when to utilize them appropriately.

(b) Nonverbal (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.

(c) Listening. In order to listen, a person must pay close attention to and make 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 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. As instructors, be aware of signals that give students the perception that you are not listening to them, such as body orientation, folded arms, or negative use of words. Once you lose the interest of the student it will be very challenging to get it back.

(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. Instructors should try to use higher order level of questions as defined by Bloom’s Taxonomy of learning. Questions that cause the learner to process, synthesize, and apply the knowledge presented during the instruction lead to better comprehension and application. It is recommended that the individual instructor research appropriate Socratic questioning techniques and experiment with what provides the most success in the classroom.

5. Apply Instructional Strategies, Tactics, and Techniques. Instructors should know and apply a variety of methods and strategies to sustain student attention, enhance student participation, facilitate learning, and select and adapt approaches based on learning goals and the student population. While comprehensive planning and preparation early in the Implement Phase is necessary, it does not guarantee success. Effective instructors develop a repertoire of instructional methods and they use this “bag of tools” to strategically plan and conduct lessons.

a. Instructional Strategies. Instructional strategies are general plans that define instructional goals and ways to achieve them. To support mastery learning, instructors need to ensure that lessons are well-defined and organized into small, ordered chunks, so they can more easily tailor the instruction to individual students, monitor progress, conduct assessments, give feedback, and offer corrections. Given enough time and great instructional quality, nearly all students can achieve a high level of mastery. The below instructional strategies are provided as a form of

scaffolding, so in order for an instructor to grow in the educational field, he/she must develop these skills as a focus for improving the learning environment.

(1) Real World Relevance. Whenever possible, reproduce the exact conditions between the instruction and the job situation to show relevance. The instructor can also physically organize the learning environment to create a realistic job setting for instruction.

(2) Students Focus. Direct student attention to what was said or will be said through the use of verbal statements, gestures, or even a pause. In addition, an instructor could discuss basic principles by presenting concepts from simple to complex to ensure student understanding of the material being presented.

(3) Control the Lesson. Ensure the learning 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.

(4) 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. Motivating students to learn is considered a “fine art” in education. This is a distinguishing factor between a novice and an expert relative to instructor mastery.

(5) Interactive Learning. Learning is an active process for adult learners. The instructor should strive to involve students in the teaching process as often as possible. 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. An example is to 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.

b. Instructional Tactics. Instructional tactics are the specific activities an instructor performs in order to achieve his/her instructional strategy. Instructors should rely on a blend of tactics in order to be dynamic and flexible relative to the needs of the students. For example, lessons may begin with direct instruction, move to interactive learning tactics for experiential practice, and include independent study as a follow-up. In order to accomplish this, instructors need to remain engaged with curriculum developers during the design and development of teaching material, so that there is a synchronized effort in maximizing the mastery of learning objectives while ensuring the lesson is presented in a manner that promotes comprehension and far transfer. As identified in reference (r), instructional tactics are categorized into five large categories (although some theorists define additional or fewer categories): Direct Instruction, Indirect Instruction, Interactive Learning, Independent Study, and Experiential Learning. The instructional techniques that follow are utilized within one of these five categories.

c. Instructional Techniques (Methods). Instructional techniques are the "how to" in presenting instruction. The methodologies used in any learning situation are primarily determined relative to the TPD and the learning objectives/learning outcomes decided upon by the instructors and curriculum developers. In many cases, a combination of methods is used to intensify the learning experiences. The categories below compile a comprehensive list of common instructional techniques, but they are not all inclusive. There is a vast array of techniques at an instructor's disposal that can be used to deliver instruction in the most effective way possible. The curriculum developer and the instructor must collaborate to ensure that the determined methodology is appropriate for the instruction. For amplifying information, refer to reference (r).

(1) Category 1: Direct Instruction. Direct instruction is highly teacher-directed, and although it is effective for providing information or developing step-by-step skills, overreliance on this method (lecture-only delivery, for example) can be passive and authoritarian. These tactics are most effective at the beginning of a new unit of study, to introduce new concepts, or to provide guidance to more novice students. Figure 7-2 lists some of the most common direct instruction techniques/methods.

		DIRECT INSTRUCTION					
		Lecture	Demonstration	Practical Application	Compare/Contrast	Drill and Practice	Modeling Thinking
CORE COMPETENCIES	Adaptability					✓	
	Attentional Control	✓	✓	✓		✓	
	Metacognition				✓		✓
	Problem Solving		✓	✓			✓
	Sensemaking		✓	✓	✓	✓	✓
STAGES OF DEVELOPMENT	Novice	✓	✓	✓	✓	✓	✓
	Adv. Beginner	✓	✓	✓	✓	✓	✓
	Competent						✓
	Proficient						
	Expert						
TIME	Little	✓			✓		
	Moderate	✓	✓	✓	✓	✓	✓
	Extensive		✓	✓		✓	✓

Figure 7-2.--Instructional Tactic (Direct Instruction)

(a) Lecture. The lecture method is a presentation of information, concepts, or principles. Its main purpose is to present a large amount of information in a short period of time and depends primarily on student listening and note-taking skills for the transfer of learning. Although the lecture method is an efficient way to introduce a new topic of study or present background material it should not be considered the

"default" instructional technique/method utilized in the Marine Corps learning environment.

1. Formal Lecture. This technique allows an instructor to teach a subject to a large audience; however, he/she 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 and should ensure that the lectures are short, well organized, and to the point.

2. Informal Lecture. The size of the group for an informal lecture is usually smaller than that of a 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.

3. Briefing. A briefing is a formal or informal presentation in which a variety of significant facts are presented as concisely as possible. A briefing is rarely concerned with material beyond the knowledge level and is almost always accompanied by media in various forms. Strictly speaking, a briefing is not a teaching method, but it is sometimes used in the learning environment.

4. Guest Lecture. A guest lecture is a presentation by a person other than the instructor who is usually an expert. It is use to give variety to the class period or to supply information in an area where the instructor is not an expert.

(b) Demonstration. This is a method in which students observe and then practice a sequence of events designed to teach a procedure, a technique, or an operation. In a demonstration, the instructor performs a task, step-by-step, and then guides the students in their own trials, providing feedback both during and after their attempts. This technique not only prepares students to duplicate the task but to also recognize how to problem solve when unexpected obstacles arise. It combines oral explanation with the operation or handling of systems, equipment, or materials. Though it primarily appeals to auditory and visual learners, it is also very effective when used in conjunction with lecture and prior to practical application.

(c) Practical Application. This is a method of practice used to reinforce a skill or a task as it relates to the work place. 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.

(d) Compare and Contrast. Compare and contrast involves breaking a concept into similar and dissimilar characteristics, which helps students to understand (and often solve) complex problems by analyzing them in a simple way. This is effective because our brains naturally compare, contrast, and classify new concepts in order to give relevance to them. For example, if students learn a new intelligence planning procedure, their brains will automatically begin comparing and contrasting the new procedure to old procedures they already know. Instructors can enhance this automatic process by asking students to explicitly reflect upon the similarities and differences between items. Such reflection improves students' comprehension

by highlighting important details, making abstract ideas more concrete, building and reinforcing memories, and reducing the confusion between related concepts.

(e) Drill and Practice. This technique uses repetition and feedback to hone memory and recall. During each iteration, students are given similar questions to answer or activities to perform, with a certain percentage of correct responses or actions allowing them to move to the next level of difficulty. Two examples of drill and practice are using flash cards to memorize human anatomy or repeatedly assembling and disassembling a rifle until it becomes automatic.

(f) Modeling Thinking. Modeling thinking is different than simply explaining or demonstrating a procedure. When modeling thinking, the instructor performs an activity and talks out loud through his/her thinking processes; anticipating questions, problems, and solutions that students might encounter; and talking through his/her mental strategies.

(2) Category 2: Indirect Instruction. Indirect instruction involves teacher-managed, student-centered learning. These tactics teach students to observe, investigate, draw inferences, form hypotheses, make conclusions, identify generalizations, find patterns, and explain their thinking. It requires higher-order thinking skills such as analysis, synthesis, and evaluation, and it helps develop students' problem-solving skills because it forces them to figure out solutions with less help from the instructor. It can also be used to support formative assessments of students, gauge students' reactions to the instruction, or reinforce and extend student understanding. Figure 7-3 lists some of the most common indirect instruction techniques/methods.

		INDIRECT INSTRUCTION							
		Guided Discussion	Indirect Discourse	Coaching	Visualization	Concept Maps	Case Studies	Metacognitive Prompts	Mindfulness Exercises
CORE COMPETENCIES	Adaptability	✓			✓		✓	✓	
	Attentional Control	✓	✓		✓			✓	
	Metacognition	✓			✓	✓		✓	✓
	Problem Solving	✓				✓	✓	✓	
	Sensemaking	✓				✓	✓	✓	
STAGES OF DEVELOPMENT	Novice				✓			✓	✓
	Adv. Beginner	✓	✓		✓	✓	✓	✓	✓
	Competent	✓	✓	✓	✓	✓	✓		✓
	Proficient	✓		✓	✓				✓
	Expert	✓		✓	✓				✓
TIME	Little		✓		✓				✓
	Moderate	✓			✓	✓	✓	✓	✓
	Extensive	✓				✓	✓	✓	

Figure 7-3.--Instructional Tactic (Indirect Instruction)

(a) Guided Discussion. Guided discussions are in line with the Marine Corps teaching model and provide an open forum for active participation from the students and proper facilitation from the instructor. This method engages learners and capitalizes on prior experience to offer peer-to-peer interaction about a topic or problem, or to seek possible available evidence on a solution. When using guided discussion as a method, it is important to ensure that organization of the learning environment (e.g. seating arrangement) is consider to allow all participants to have eye contact with each other. Used alone or in combination with other methods, guided discussion offers intellectual stimulation for 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. Teaching professionals should always strive for maximum student involvement to facilitate learning. Per reference (b), CG TECOM has determined that in order to satisfy the Values Based Training/Leadership (VBT/L) requirement, the most appropriate means of delivering VBT/L instruction is by facilitating a guided discussion and should be interwoven into the POI. It is understood that there are other ways this can be accomplished; however, leaders are expected to deliver VBT/L instruction in this manner across the Training and Education continuum.

(b) Indirect Discourse. These 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 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.

1. Panel Discussion. A panel discussion 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.

2. Dialogue. A dialogue is an interaction between two or more people, 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.

3. Teaching Interview. 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.

(c) 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 video 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.

(d) Visualization. Visualization is the process of guiding students through a mental simulation of a task, which increases their

decision-making skills and general task performance. To lead a visualization exercise, describe a vivid scene from beginning to end, incorporating a variety of alternate outcomes and responses for students to imagine. Use visualization when rehearsing a task that requires self-reflection on decision making in dynamic situations or when acquiring a new skill.

(e) Concept Map. Concept maps are graphical diagrams that show the relationship among concepts. Because they link a visual image with an abstract concept, they improve students' understanding of complex ideas, help them organize their knowledge, and enhance their critical thinking skills. Concept maps are useful for nearly any learning objective since they utilize general cognitive skills, such as defining, describing, comparing and contrasting, classifying, understanding relationships, sequencing, and identifying cause and effect.

(f) Case Study (Decision-Forcing Case). Case studies include an in-depth analysis of one or more actual events, including the people involved, their decisions and actions, contextual variables, relevant policies, and the short- and long-term outcomes of the situation. Since case studies are based upon real events, students often become highly engaged and feel a sense of urgency. The main objective is for students to gain practical knowledge and to develop analytical and problem-solving skills. The greatest value is that it challenges students to apply what they know and comprehend to a realistic situation. Case studies focus predominantly on analyzing and understanding the process of making decisions and making sense of complex or ambiguous information. They are an excellent method for bringing together multiple learning points under a culminating exercise that causes students to process, analyze, and synthesize information.

(g) Metacognitive Prompts. Metacognitive prompts are specifically design to enhance metacognitive skills, including self-awareness, self-monitoring, and self-regulation. This technique involves questions and reminders that encourage metacognitive thinking, such as planning, monitoring, and evaluating one's thinking processes. Metacognitive prompts help students develop metacognitive skills, which substantially enhance future learning outcomes and performance on other cognitive tasks.

(h) Mindfulness Exercises. Mindfulness exercises are the process of paying attention in a particular way, on purpose, in the present moment. In other words, mindfulness is "paying attention to paying attention." It involves noticing when you become distracted and consciously refocusing your attention when the distraction occurs. Mindfulness exercises involve brief, guided experiences that help students consciously notice when they becomes distracted and actively refocus their attention when that happens.

(3) Category 3: Interactive Learning. Interactive learning involves student-centric activities and peer learning. These methods can be use in the middle of a lesson arc to reinforce and extend students' understanding, or in situations where some students "get it" and others do not. Interactive learning also works well in conjunction with indirect methods. Figure 7-4 lists some of the most common interactive learning techniques/methods.

		INTERACTIVE LEARNING					
		Premortem Exercises	Crystal Ball	Jigsaw	Role Play	Fishbowl	Socratic Seminar
CORE COMPETENCIES	Adaptability	✓	✓		✓	✓	✓
	Attentional Control			✓	✓	✓	✓
	Metacognition						
	Problem Solving	✓	✓	✓	✓	✓	✓
	Sensemaking	✓	✓				✓
STAGES OF DEVELOPMENT	Novice			✓	✓		
	Adv. Beginner	✓	✓	✓	✓	✓	✓
	Competent	✓	✓	✓		✓	✓
	Proficient	✓				✓	✓
	Expert	✓				✓	
TIME	Little	✓					
	Moderate	✓	✓	✓	✓	✓	✓
	Extensive			✓	✓	✓	✓

Figure 7-4.--Instructional Tactic (Interactive Learning)

(a) Premortem. Premortem exercises encourage students to envision a future where a mission has failed and to formulate a list of potential causes, which are then address preemptively. Use the premortem method to identify potential vulnerabilities in a plan, project, or course of action before executing an exercise or mission. This preventative activity builds students' intuition and sensitivity to potential problems or risks and it enhances their mission planning skills.

(b) Crystal Ball. Similar to premortem exercises, the Crystal Ball technique is a "devil's advocate" method of uncovering assumptions in a given scenario, generating a variety of interpretations of the evidence, and providing alternative solutions for action. Students listen to a brief scenario and offer a short course of action; then the instructor "gazes into the crystal ball" and tells the Marines that they are wrong. The intent is to force learners to think differently by increasing the number of factors they consider when making a decision and to encourage them to think of alternatives.

(c) Jigsaw. This technique is a cooperative learning exercise where students work together to delve deeply into a topic or to complete a complex assignment. In jigsaw, students are grouped into teams and the instructor designates each team member as an "expert" on one element of the task. Each "expert" completes his/her portion of the task and learns as much as possible about it. Then "experts" brief their fellow team members on their areas of expertise. In the end, all members of the team learn about

all aspects of the task and they retain the information better after this team-teaching activity.

(d) Role Play. Students in groups of three or four are assigned "roles" that come with a certain set of responsibilities. Then students work together to complete a task or learning activity while maintaining their roles. This technique helps students see the value of different roles and positions (e.g. team building) as they learn how each role helps contribute toward a common goal. Research suggests that allowing students to expand their experiences through role-playing exercises increases their mental libraries, which can lead to more effective decision-making.

1. Tactical Decision Game (TDG). A cost effective, role-playing exercise that presents the student with a complex problem to solve in a stressful, time constrained environment, while providing limited information to make a decision. Students learn they must be good communicators who can adapt quickly and think both critically and reflectively. From the standpoint of human capital, it is far less costly to hone such decision-making skills in the training environment than on the battlefield. TDGs help develop adaptive, perceptive students by teaching them "how to think" not "what to think". TDGs are instructional energizers that students often take back to their home stations and use to train their staffs.

2. Ethical Decision Game (EDG). In complex and ambiguous operational environments, Marines may need to make ethically challenging decisions, under high amounts of stress, in a matter of a few seconds. To foster development of these ethical, yet rapid, decision-making skills, Marines can engage in EDGs. These exercises present scenarios with ethical complexities and ask Marines to make decisions. The exercises focus on real-world dilemmas that Marines are likely to face. EDGs allow learners to rehearse their responses to morally traumatic situations in a safe environment to understand the range of potential responses. Repeated practice of these morally complex decisions with the guidance of instructors and fellow Marines allows individuals to construct an internal list of possible responses, giving each Marine the mental and emotional conditioning needed to respond appropriately in combat.

3. Kriegspiel. Similar to TDGs, a Kriegspiel (war-game) is a two-sided role playing exercise that presents complex problems in a stressful, time-constrained environment with limited information. This method is elaborated, scripted and involves a third party to calculate and assess moves. Students learn they must be intuitive, analytical and adaptable in their decision-making ability. The decisions themselves are less important than having students understand why they made the decisions in the first place. Experience, visualization and pattern recognition are necessary cognitive skills. Kriegspiels help develop analytical, reflective students by teaching them to think creatively and in unusual ways. Kriegspiels are interactive exercises that can be used to present tactical problems and/or assess higher order thinking skills.

(e) Fishbowl. Selected students are placed within a "fishbowl" in which they ask questions, gather information, and express their ideas. Students outside of the designated fishbowl listen to the discussion and focus their attention by making notes, and then the roles reverse. This strategy forces students to focus on and think about someone else's ideas

before forming a response, which trains students to respond with logic instead of with emotions and helps them practice active listening.

(f) Socratic Seminar. For those instructors who want to emphasize a point and stimulate student thinking, a Socratic seminar is very effective. This method allows students to think critically, analyze their own knowledge, and collectively expose gaps and misconceptions in their mental models. During the Socratic seminar, students take turns asking open-ended questions, responding to their peers' questions, and paraphrasing each other's responses. Open-ended questions allow students to think critically, analyze multiple meanings in text, and express ideas with clarity and confidence, and the question-and-answer format of the seminar promotes team building and encourages active listening. This technique 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. Students' questions may often be a measure of the degree of their understanding of a particular subject. The seminar is student controlled, although a skilled responder can also control the session to a certain extent.

(4) Category 4: Independent Study. Independent study refers to the range of instructional tactics that students complete independently or as part of a small group. Independent study involves individual, self-led learning, such as completing homework. It is very flexible and can be used as the primary instructional approach for an entire class, in combination with other instructional tactics, or assigned to some students while the rest of the class completes a different activity. This tactic can be use at the end of a lesson as a formative assessment or as a way to determine whether each individual student can "tie it all together." Figure 7-5 lists some of the most common independent study techniques/methods.

		INDEPENDENT STUDY					
		Reading Assignments	Self-Paced	Journal Writing	Learning Logs	Field Research	Assigned Questions
CORE COMPETENCIES	Adaptability	✓	✓			✓	✓
	Attentional Control					✓	
	Metacognition			✓	✓		
	Problem Solving	✓	✓	✓	✓		✓
	Sensemaking	✓	✓	✓	✓	✓	✓
STAGES OF DEVELOPMENT	Novice	✓	✓	✓	✓		✓
	Adv. Beginner	✓	✓	✓	✓	✓	✓
	Competent		✓	✓	✓	✓	✓
	Proficient			✓	✓	✓	✓
	Expert			✓		✓	
TIME	Little	✓	✓	✓	✓		
	Moderate	✓	✓	✓	✓		✓
	Extensive					✓	✓

Figure 7-5.--Instructional Tactic (Independent Study)

(a) Reading Assignments. This is a very effective and time efficient method of presenting materials since students can progress at their own pace. 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. Many blended learning environments use this method to enhance student learning by providing opportunities for research beyond the scope of the material being taught.

(b) Self-Paced. This method allows the student to be in control of the speed in which they learn the material. The instructor can use CBT programs or leverage external products in order to focus the learning on specified outcomes/objectives. This form of teaching would require an established means of evaluation in order to properly facilitate the learning. The instructor would serve as a proctor to ensure that students are held accountable for their products.

(c) Journal Writing. Journaling helps students expand and reflect on their understanding of a lesson through writing. While writing a journal entry, students become actively engaged in their own learning, which gives them an opportunity to clarify and analyze their thinking.

(d) Learning Logs. Learning logs capture students' reflections about their learning. The entries are short, frequent, and factual. In contrast to traditional journals (which tend to be free-flowing, subjective, and full of personal options), learning logs are generally concise and more objective.

(e) Field Research. Field research takes students outside of the classroom, library, or computer lab and forces them to directly observe and record their research firsthand. Field research includes activities such as conducting interviews, recording observations, and completing surveys. It positions students to become active information seekers, which can be more effective than traditional research.

(f) Assigned Questions. If students do not have enough time to complete a field research project, instructors can use assigned questions. Individuals or small groups of students answer the questions by seeking evidence in books, articles, observations, or through interviews. Students discuss their responses in order to reinforce learning.

(5) Category 5: Experiential Learning. Experiential learning (or hands-on learning) is inductive, learner-centered, and activity-oriented. Experiential methods are often used after students have mastered basic concepts; for more advanced students; to help students integrate concepts; or to help students learn to apply, think, and innovate in novel situations. Figure 7-6 lists some of the most common experiential learning techniques/methods.

		EXPERIENTIAL LEARNING					
		Offsite (Field trip)	Tactical Walk (TEWT)	Sand Table Exzercise	Computer Simulations	Experiments	Model Building
CORE COMPETENCIES	Adaptability	✓	✓	✓	✓	✓	
	Attentional Control	✓	✓	✓	✓	✓	✓
	Metacognition				✓		
	Problem Solving	✓	✓	✓	✓	✓	✓
	Sensemaking	✓	✓	✓	✓		✓
STAGES OF DEVELOPMENT	Novice						
	Adv. Beginner	✓					
	Competent	✓	✓	✓	✓	✓	✓
	Proficient	✓	✓	✓	✓	✓	✓
	Expert	✓	✓	✓	✓	✓	✓
TIME	Little						
	Moderate	✓	✓	✓	✓	✓	✓
	Extensive	✓	✓	✓	✓	✓	✓

Figure 7-6.--Instructional Tactic (Experiential Learning)

(a) Offsite. Offsite (e.g. 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. There are general guidelines when conducting offsite, so the instructor needs to ensure he/she researches all requirements necessary to conduct the offsite (e.g. special requirements, approvals, authorizations, and logistics).

(b) Tactical Walk. The term “tactical walk” usually refers to a Tactical Exercise without Troops (TEWT). This method is a time-constrained exercise that requires participants to devise, express, and defend a solution to a tactical problem. The physical setting is a major element of the exercise and students literally explore it as part of the walk. In doing so, students gain firsthand experience about how terrain influences operational performance. Tactical walks can build team cohesion, improve students’ communication skills, enhance their tactical problem-solving and decision-making skills, and provide experiences that they can later draw upon for sense making.

(c) Sand Table Exercise (STEX). STEXs use three-dimensional terrain models with various props that represent assets and liabilities. STEXs allow Marines to practice making tactical and strategic decisions, practice communicating those decisions as briefings or instructions, and build tactical and strategic pattern-recognition skills.

(d) Computer Simulations. Simulations are defined as a model of a system animated discretely or continuously over a period of time. Frequently, when personnel talk about simulators, they often mean computer-based simulators, such as flight simulators. The Marine Corps owns and operates a number of these simulators and they support instruction for a wide variety of technical areas, including tactical air, ground, surface, and subsurface actions; medical skills training; and strategic planning.

(e) Experiments. With experiments, instead of simply being informed about a topic by the instructor, students learn to make predictions, and then conduct an experiment to prove or refute their hypotheses. Students "experience" the learning, which helps them retain and apply the acquired knowledge.

(f) Model Building. A model can be a device, equation, picture, or replica. The model performs or predicts how its analogue (e.g. the actual thing) behaves. Building models encourages exploration and helps students understand cause-and-effect relationships. Scientists, engineers, and students use models to think about, predict, design, and understand how real things work or normally behave.

6. Assess the Effectiveness of Instruction. The purpose is to provide more individually tailored instruction that accounts for prior knowledge and experience through assessments of competencies. Therefore, the importance of incorporating valid and reliable assessments cannot be overstated. In the Develop Phase, curriculum was created to support the facilitation of team based, student centered learning vice individual based, and instructor centered learning. In order to implement this, the instructor must be able to know and apply various evaluation techniques, assess student learning, provide performance feedback, and verify attainment of program objectives and outcomes. NOTE: MCTIMS SEV provides the capability to construct tests, record test data, track student scores, grade point averages (GPA), and generate reports.

a. Assess Course Instruction. Course evaluation for the purpose of improving the overall quality of a program is an ongoing process. A common practice in education and training is to provide "checks on learning," both during and immediately following instruction. More formally, these checkpoints are called formative and summative evaluation. Formative assessments are instructional interventions that enhance the effectiveness of a course and can be used to track quantitative scores. Whereas summative assessments can lead to decisions concerning program improvement, continuation, extension, or termination.

b. Assess Student Learning. A student's knowledge and skill level can be tested at different intervals before, during, and after the course of instruction. Formative assessments are typically less formal than summative tests because the primary goal of formative assessments is to enhance learning rather than to grade students. Summative assessments, on the other hand, are formal tests used to measure cumulative learning outcomes, such as at the end of a course. Quite often, students' summative performance scores are simply recorded; however, the emphasis should be placed on higher-order learning in which the type of assessment should employ a mastery learning approach. The following steps provide a sequential process for assessing student learning through testing.

(1) Gather Test Materials. An instructor needs to know the materials required, the type of test to be given, and have access to the materials.

(2) Prepare the Learning Environment. The selection of a place to administer a test is very important for reliable evaluation results.

(3) Clarify Directions. An instructor needs to 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.

(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), clarify the instructions/directions and check back with the student(s) to see if they understand the directions mentioned.

(5) Conduct the Test. After the test materials have been gather, the environment prepared, the instructions/directions given, and an opportunity for questions has been provided, the evaluator is ready to conduct the test.

(6) Scoring/Grading. A test may be valid, reliable, and comprehensive, but if not scored and graded properly individual scores and grades are useless.

(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.

(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 mastery or non-mastery 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.

7. After Lesson Management. The purpose is to ensure the effective and efficient use of school resources. By ensuring the learning 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 Formal School's evaluation program.

a. After Lesson Actions. After lesson management, actions are all the activities that must be perform after the lesson has been conducted. These activities should include, at a minimum:

(1) Removal of media from the learning environment.

(2) Securing all classified material.

(3) Leaving the learning environment as it was found.

(4) Conducting a cleanup of outdoor facilities.

(5) Turning in resources temporarily borrowed for the lesson.

(6) Reviewing the Formal School Academic SOP.

b. Completing an After Instruction Report (AIR). 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 AIR. Included in the AIR is the compilation of rating form 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.

(1) Collect Data

(a) Students. Student feedback is critical to ensuring that the instruction is appropriately delivered using adult learning methods. Regardless as to whether or not the assessment is performance or knowledge based, the transfer of learning will be assessed relative to the students. The Formal School Academic SOP should codify the procedures necessary to collect student feedback and the process to analyze and synthesize the results in order to recommend changes for continuous improvement. The feedback may include information, such as problems with a lesson, instructors, or other materials associated with instruction. The frequency and number of rating forms used will depend upon the Formal School's Academic SOP in order to support their internal evaluation plans. When a lesson is being given for the first time, it is recommended that all students complete an Instructional Rating Form (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/outcomes, the amount of time spent in presenting a lesson, the learning environment, and opinions about instructional materials. Instructors can make any amount of recommendations associated with the lesson, and the course as a whole. All instructor comments are recorded on the AIR.

(2) Analyze Data. Before data can be analyzed, it should be categorized into the four Functional Area Checklist (FAC) 400 inspectable areas identified in reference (b) and noted in Figure 8-4: Course content and course materials, Student performance, Instructor performance, and Learning environment. Instructors should 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 superseded; this would be an immediate problem area, with no need to establish a trend of similar comments.

(3) Record Data. Once all data has been collected and analyzed, record the data on the AIR. Listed below are the procedures for recording data:

(a) IRF Data. After the lesson, the instructor should collect all IRFs and compile all the data. Record the compiled data on the appropriate block of the AIR. This should be 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 can also make comments and recommendations related to areas of concern dealing with students, instruction, and the feedback given back from the students.

(b) Time-Critical RA. When instructing in the classroom, the need for RM is paramount. Instructors are entrusted with the safety of the students and for this reason; RA is needed in every aspect of training and education. Though the RA is already complete, the instructor can have a significant impact on controlling risk by conducting a Time-Critical RA prior to commencement of each instructional block. If new safety requirements are identified during the lesson, the instructor should record the lessons learned, additional controls used, and/or occurrences in the Instructor Comments area labeled “Reassessment of RA.” By allowing the RA to be included in the AIR, other instructors will benefit in the future.

(c) Make Recommendations. Recommendations come in the form of instructor comments. These recommendations are based on the instructor’s analysis of the identified trends.

CHAPTER 8

EVALUATE PHASE

1. Introduction. The purpose of the Evaluation Phase is to determine the effectiveness and efficiency within an instructional program and to identify improvements that ensure maximum relevance and effect of Marine Corps instructional systems relative to the demands of training readiness, learning environments, and the learners themselves. Evaluation can occur deliberately within the Evaluation Phase or it can occur continuously throughout every phase of the ADDIE process. For example, the T&R Working Group (Analyze Phase) and the CCRB (Design and Develop Phase) both use the products of evaluation to identify problems within the instructional systems, craft solutions to those problems, and then validate and transition those solutions and associated products into practice. Using the processes and procedures outlined in this chapter, Formal Schools can establish a systematic evaluation program to evaluate instruction, identify deficiencies, document evaluation results, and make recommendations for use by decision-makers to modify, continue, or terminate a program. Figure 8-1 illustrates the inputs and outputs of the Evaluate Phase.

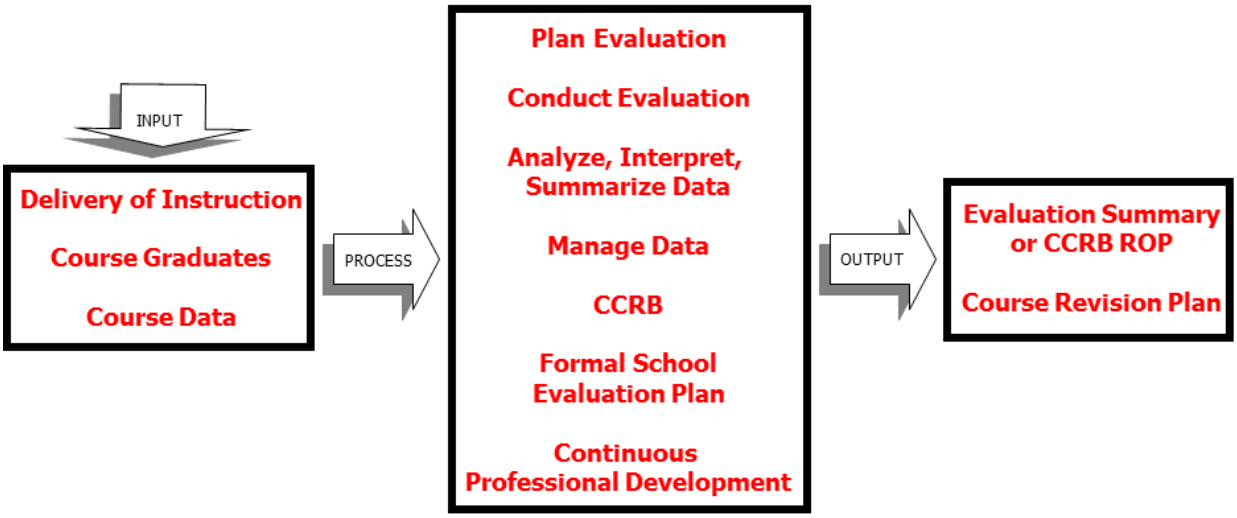

Figure 8-1.--Evaluate Phase Flowchart

2. Plan Evaluation. Thorough and systematic planning is key to a successful evaluation plan. For an evaluation to provide the information required for making decisions concerning an instructional program, it must identify the critical 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.

a. Types of Evaluation

(1) Formative Evaluation. Formative evaluation is process oriented and used to gauge individual progress, modify teaching and learning activities, and improve learner achievement. It provides useful information for improving an instructional program and leads to decisions concerning instructional program development. Formative evaluation involves validating

instruction before it is implemented and making refinements to improve the instructional program prior to its implementation. It is ongoing at all times both within and between each phase of the ADDIE model. 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, concept cards, student materials, media, test items).

(2) Summative Evaluation. Summative evaluation is product oriented and is conducted after a course of instruction 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. TECOM instructional system specialist). 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. It can also be a comprehensive assessment of all these factors to evaluate the instructional program's overall effectiveness and efficiency.

b. Identify Types of Data Collected. There are two types of data that are collected as part of an effective evaluation program.

(1) Qualitative Data. Qualitative data is subjective in nature. It emphasizes standardization, precision, and reliability as measures of efficiency.

(2) Quantitative Data. Quantitative data is objective in nature and is gathered through standard methods (e.g. measures of efficiency, participant observation, interviews).

c. Identify Evaluation Roles and Responsibilities. Each Formal School is uniquely task organized to its mission. The standard structure and descriptions generally encompass those identified in this chapter. In order to foster continuous improvement, the professional development of academic faculty and support personnel needs to be codified and articulated appropriately in a SFDP. These individuals directly or indirectly contribute to the primary mission of the school and are solely focused on the transfer of learning to the students within their institution. Amplifying information can be found in reference (b).

(1) Academic Faculty. Consists of military personnel and civilians who are directly involved in the design, development, instruction, assessment, revision, and adaptation of the POI or curricula to ensure its standards, quality, and relevance. Additionally, faculty members should be engaged in the research, service, community of practice, and professional development in their areas of competency.

(2) Support Personnel. Support Personnel are primarily responsible for the general support of the Formal School (e.g. administration, supply, logistics, operations). Although support personnel focus on the day-to-day operations of the Formal School, they can also be requested to assist faculty members as an adjunct member.

d. Identify Evaluation Issues. A school CO/OIC/DIR will 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. To develop this comprehensive list, the evaluator must gather information from a variety of sources including:

(a) Subject matter experts, instructors, students, managers, and any other individuals who are or will be affected by the results of the evaluation.

(b) Existing curriculum, instructional documentation, previous evaluation data, policies/directives, local SOP, and other appropriate 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.

(3) Select Evaluation Approach. Once the focus of the evaluation is defined, the evaluation approach is selected. Three approaches to evaluation are recommended: objectives-oriented, management-oriented, and operational test and evaluation. These approaches are based on the goal of the evaluation; they determine the focus, but do not change the procedure for conducting evaluation.

(a) Objectives-Oriented Evaluation. The objectives-oriented approach determines the extent to which learning objectives have been achieved. 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 8-2 provides considerations for the focus of objective-oriented evaluation.

OBJECTIVES-ORIENTED EVALUATION (CONSIDERATIONS)
When using Objective-Oriented Evaluation, the focus is on determining whether: ➢ Sequence the learning objectives with dependent relationships in a hierarchical arrangement. ➢ Students master the learning objectives. ➢ Learning objectives meet the goal(s) of the program and support the T&R events. ➢ The standards in the learning objectives are realistic and obtainable. ➢ Student assessments accurately measure the stated learning objectives. ➢ Graduates are able to perform the tasks in the operating forces.

Figure 8-2.-- Objectives-Oriented Evaluation (Considerations)

(b) 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 CO/OIC/DIR 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 CO/OIC/DIR may direct that an evaluation should be conducted to determine the upgrade's effect on the instructional program. The Formal School's concerns, informational needs, and criteria for instructional effectiveness guide the direction of the evaluation. Figure 8-3 provides how management-oriented evaluation assists the decision-maker.

MANAGEMENT-ORIENTED EVALUATION (CONSIDERATIONS)
When using Management-Oriented Evaluation, the approach allows decision-makers to: ➢ 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. ➢ 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 instructional techniques/methods do not support. Alternative strategies, such as Mobile Training Teams (MTT), distance learning, CBT, etc., may be proposed. ➢ 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 the learning environment may indicate a need to increase instructor preparation time or improve the instructional environment. ➢ 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 8-3. -- Management-Oriented Evaluation (Considerations)

(c) 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 8-4 illustrates how operational test and evaluation assists the decision-maker.

OPERATIONAL TEST AND EVALUATION (CONSIDERATIONS)
When using Operational Test and Evaluation, decision-makers are able to consider: ➢ Cost. Cost is analyzed to determine if it will be cost efficient to invest in an alternative product or upgrade the existing product. ➢ Benefits. This analysis includes determining how the benefits among products will be measured. It also results in the determination of whether the benefits are worth the expenditure of resources (e.g. time, money, personnel) to implement ➢ 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. ➢ 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?

Figure 8-4.--Operational Test and Evaluation (Considerations)

3. Conduct Evaluation. In Marine Corps training and education, the revision of courses is paramount to meeting the needs of the OPFOR. Whether it is affected by new equipment, new orders, or new technology, how a task is performed in the OPFOR can fluctuate based upon emerging requirements. Formal Schools must be prepared to obtain data compiled from different phases of the ADDIE process in order to improve the overall result. The ADDIE model provides a system of checks and balances that gives the school the ability to conduct evaluation throughout any phase of the process. For a new course being developed, this process shows how formative evaluation 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. Using summative evaluation, data can be collected regarding

existing courses, which may be used to assist in identifying the strengths and weaknesses within the course in question. Evaluation instruments have been identified and information is provided on conducting the evaluation. The primary areas of evaluation are codified in Figure 8-5 and will, at a minimum, provide evaluation data on these four areas.

PRIMARY AREAS OF EVALUATION
➢ Course content and course materials ➢ Student performance ➢ Instructor performance ➢ Learning environment NOTE: These are inspectable items in the FAC 400.

Figure 8-5.--Primary Areas of Evaluation

a. 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 available.

(1) T&R Manual. The T&R manual defines individual and collective training requirements and serves as the basis upon which instruction is built. Therefore, the T&R must always be reviewed to assure the association between the curriculum and the training standard. For instance, if evaluation data indicates a problem with TLOs, Marine Corps policy provides the procedure for downgrading the TLO or procedures to update a T&R event out of cycle.

(2) Program of Instruction (POI). In accordance with Marine Corps policy, all existing courses will have a current POI. The POI (maintained in MCTIMS) provides the resources required for the course, learning objectives, instructional hours, number of instructors required for each class, methods and media, and other required elements. This information is vital to the evaluation of a course. For example, an evaluator needs to ensure that the lesson plans reflect the correct information contained in the concept cards of the POI. If there are problems with the approved POI, then the data needs to be gathered so that it can be presented at a CCRB.

(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 contained in the MLF. If the course is new, then the MLF will not be produced until the end of the develop phase. For instance, if a student comments on an IRF that numerous words are misspelled in the student handout, then the MLF can be pulled and checked for misspelled words.

(4) Academic SOP. The Academic SOP specifies academic policy for the school. The SOP may provide information about how data is gathered and compiled for the school and what resources are available to provide

evaluation data. This is valuable information for evaluation of the design, develop, and implementation phases.

(5) Formal School Evaluation Plan (FSEP). The intent of evaluation in any Formal School is to determine the effectiveness of a course. In accordance with Marine Corps policy, Formal School CO/OIC/DIRs are required to conduct course evaluations on an ongoing basis as part of the school's overall FSEP. The evaluation plan is based on a three-year cycle and should coincide with the CCRB battle rhythm outlined later in this chapter.

(6) Inspection Reports/Assist Visit Reports. Some MOSs have inspection teams that visit the OPFOR to ensure that the standards required by the Marine Corps are adhered to. When it is possible, information is retrieved revealing strengths and weaknesses from the OPFOR 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 OPFOR, or both.

(7) Record of Proceedings (ROP). The ROP provides documentation of the discussion items and recommendations made during a CCRB. For existing courses, this document offers recommended changes, additional operational needs that were identified, or additional resources needed at the Formal Schools. Sometimes, the ROP will reveal areas where additional data needs to be collected to determine or support needs that were identified during the CCRB.

(8) Formal School Evaluation Report (FSER). The FSER, formerly known as the Formal Learning Center Evaluation Report (FLCER), is a tool used to organize formative and summative data, identify trends, and provides a means to recognize any problems that might have occurred with evaluation outputs. It is the Formal School's voice in the T&R process to communicate 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 OPFOR. Once created, this report will greatly benefit the T&R Working Group and will assist attendees in reviewing ITEs in light of the results contained in the FSER report. Formal Schools should submit the FSER no later than 60 calendar days prior to the T&R Working Group summarizing the result of evaluations associated with every CID. The FSER can also be used to support the CCRB. At a minimum, this report should contain:

(a) OPFOR assessment of Formal School's transfer of learning.

(b) OPFOR assessment of the relation of Formal School product to the mission of the gaining unit.

(c) OPFOR assessment of gaps in training and education, specifically:

1. Individual events not identified in the T&R nonetheless required by the mission.

2. Individual events required to be trained at the Formal Schools, but identified as MOJT in the T&R Manual.

3. Individual events assigned to the Formal School but irrelevant to a unit's mission.

b. Analyze Phase Evaluation. Data is collected during the Analyze Phase to determine readiness requirements, identify the task list, T&R events, learning setting, and the TPD. Methods of evaluation are established to ensure the accuracy of the outputs from the Analyze Phase. For example, a FEA is considered a primary evaluation tool because it highlights changes that take place over time across an OccFld by identifying common trends in how Marines are used, what tasks are being performed, and how they coincide or differ from what they are being trained to do at MOS school. If a problem is identified within the evaluation results, then all of the information is consolidated into a FSER and provided to the TECOM Task Analyst. The following information is the focus of effort when using evaluation data to update source documents. Figure 8-6 provides a list of questions to ask during the Analyze Phase.

ANALYZE PHASE EVALUATION (CHECKLIST)
☑ Is the FEA report a valid reflection of career level/OPFOR/supporting establishment competence gaps? ☑ Do MCCLL and other service level data trends identify competence gaps? ☑ Does the T&R manual reflect the competencies necessary to perform the career level/job/community in the operating forces? ☑ Does the competency analysis include all of the prerequisite KSAs needed to perform the learning goal and is the prerequisite nature the same accurately represented? ☑ Does the setting accurately replicate, within the confines of resources, the setting where the career level, community, functional area, or job is performed?

Figure 8-6.--Analyze Phase Evaluation (Checklist)

c. Design Phase Evaluation. During the Design Phase, knowledge and skills are identified, learning objectives and test items are developed, the facilitation method is selected, and the sequence of instruction is determined. Methods of evaluation must be established to ensure that these outputs are accurate. Checklists can be used to provide continuity to the process and a standard for the product, but should not limit creativity or inhibit experimentation. 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 to determine whether or not there are indicators that the products of this phase could possibly be flawed. Additional items can be added to, or removed from, the checklists to meet school needs. The following checklists are useful resources to be used during the evaluation of the Design Phase: LAW Checklist, LOW Checklist, Method and Media Selection Checklist, Test Item Checklist, and Test Checklist. The location of these checklists is identified in Appendix E. Figure 8-7 provides a list of questions to ask during the Design Phase.

DESIGN PHASE EVALUATION
☑ Are the course learning outcomes an aspirational reflection of the way the learner should be after the course? ☑ Is the TPD an accurate depiction of the general physical, academic, social, and background of the learners? ☑ Do the learning outcomes developed during the learning analysis link back to the T&R Manual? ☑ Do the knowledge and skills accurately reflect what needs to be taught for each performance step? ☑ Do the learning objectives support the T&R events? ☑ Do the learning objectives accurately and clearly state what knowledge/skill will be required for performing the job? ☑ Does the test accurately measure the knowledge, skill, or task? ☑ Are the testing methods appropriate to the subject matter? ☑ Do the test items consistently measure the same knowledge or performance? ☑ Do the assessment instruments and their related mastery criteria reliably distinguish between competent and incompetent learners? ☑ Is the delivery system selected appropriate for the level of knowledge that the target population will possess? ☑ Is the sequence of instruction organized logically to enhance the process of learning the material?

Figure 8-7.--Design Phase Evaluation (Checklist)

d. Develop Phase Evaluation. During the Develop Phase, the course schedule is determined, the media is produced, MLFs are created, and the POI is generated. Methods of evaluation must be established to ensure that these outputs are accurate. For both new and existing courses, it is recommended that checklists are used to evaluate the products of the phase. These checklists are completed and should be placed in the MLF as source documents. Additional items can be added to the checklists to meet school needs. Once the course development is completed, then validation takes place so that problems with the POI are identified prior to implementation. The following checklists are used during the evaluation of the Develop Phase: Concept Card Checklist, Lesson Plan Checklist, Student Outline Checklist, and Method/Media Checklist. The location of these checklists is identified in Appendix E. Figure 8-8 provides a list of questions to ask during the Develop Phase.

DEVELOP PHASE EVALUATION
☑ Does the content present a consistent perspective? ☑ Do the instructional materials support the learning objectives? ☑ Does the instructional method facilitate maximum learning? ☑ Is the instructional method appropriate to the subject matter? ☑ Are training aids suitable to the instruction and subject matter? ☑ Are examples, practice exercises, and feedback methods realistic and accurate? ☑ Is the approach consistent with current instructional theory in the content area? ☑ Is sufficient time allotted for instruction and practice?

Figure 8-8.--Develop Phase Evaluation (Checklist)

e. Implement Phase Evaluation. During the Implement Phase, effective and efficient facilitation of instruction is conducted to promote student learning. Evaluating the learning objectives 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. 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 has a Formal School Evaluation Plan (FSEP) in place to ensure that data is collected properly and that there is standardization in record keeping. The FSEP will be contained within the Formal School Academic SOP.

f. Internal Evaluation. As noted in Figure 8-4, potential improvements to courses are identified by the four primary areas of evaluation:

(1) Validating and Assessing Course Content & Course Materials. Course materials (e.g. lesson plans, student materials, media, test items) should be reviewed and updated regularly. Curriculum developers and instructors should ensure that current materials are being used as planned and in accordance with an approved POI. In addition, a review of course materials should include course control documents (e.g. POI, ROP). Course control documents provide an administrative check of how the course is being implemented in support of the MCISD/SATE process. Figure 8-9 provides questions to ask when evaluating course content and course materials.

IMPLEMENT PHASE EVALUATION
☑ Do the instructional materials support the learning objectives? ☑ Is the student outline easy to follow? ☑ Are training aids suitable to the instruction and subject matter? ☑ Are the test instructions clear and understandable? ☑ Is the format of the test easy to follow? (Students do not have to flip pages, like questions are grouped together, etc.) ☑ Do students have all of the materials (equipment, calculator, etc.) necessary to complete the test? ☑ Do students use the course materials available to them?

Figure 8-9.--Implement Phase Evaluation (Checklist)

(2) Assessing Student Performance. A pass-fail checklist or rubric is commonly used in performance tests where students are rated on mastery of learning objectives. These evaluation tools are easy for an instructor to complete while observing student performance during a performance test. If an evaluation includes visits to various 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 learning environment and that of the "real world."

(3) Evaluating Instructor Performance. Instructors are commonly evaluated and rated by students through IRFs and ECCs. Instructors are also evaluated by Formal School academic faculty using a local Formal School Instructor Evaluation Checklist (IEC). All instructors should welcome the opportunity to be evaluated by others. Through this process, the instructor will receive feedback on strengths as well as those areas that need improvement. Robust external evaluations of individual performance through data gathering from multiple sources should be developed and implemented to continuously fine tune learning content. When evaluating faculty, it is recommended that considerations are made to assess specified designations, counseling session documentation, attendance rosters for faculty development training, platform hours, and contact hours.

(4) Assessing the Learning Setting. The learning setting must be assessed to ensure it is meeting the requirements of the instructional program. The evaluator should first review the course requirements for instructional facilities. The evaluation 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.

g. Continuous Evaluation. Evaluation is continuous throughout all phases of the MCISD/SATE process. Figure 8-9 provides a table that lists the various tools, their purpose, when they are conducted, and who uses the tool. The following resources are tools that Formal Schools can use to conduct continuous evaluations.

(1) Instructional Rating Form (IRF). An IRF is a reaction form (questionnaire) submitted to students following completion of a period of instruction that provides feedback on instructor performance, course materials, and learning environment. However, this should not be the sole indicator of proficiency or effectiveness. Students are provided time to complete the forms at the end of the class. Instructors will be evaluated using a local adaptation of the IRF, which will be maintained by the respective Course Chief. It is recommended that when developing the IRF, considerations should be made for both student learning and instructional methods (techniques). The Academic SOP may designate the type and format of data collection from students. 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. Specific information regarding a particular lesson may be lost unless data is gathered at a regular interval (i.e. after each class, daily, or at the end of a phase).

(2) Examination Rating Form (ERF). An ERF is a reaction form completed by students upon completion of examination that provides feedback on the facilitation and content of the examination. For pilot courses or validation courses, Formal Schools may find it beneficial to issue ERFs to a larger cross-section of the TPD. Immediately following an examination (performance or written), ERFs may be distributed to 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, or equipment.

(3) After Instruction Report (AIR). An evaluation tool that summarizes one-iteration of a lesson by documenting the student's assessment, instructor's assessment, test results, and any additional data related to the specific lesson.

(4) End of Course Critique (ECC). The ECC is an evaluation instrument completed by the student after a course so that the student can assess the overall course. 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 POI 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.

(5) After Course Report (ACR). The ACR, much like the AIR, summarizes all the pertinent data from the consolidated IRFs including data from the analysis and interpretation of the ECCs.

(6) Instructor Evaluation Checklist (IEC). This particular checklist is a tool that can be used when evaluating instructors. It covers, but is not limited to the evaluation of platform techniques, thorough coverage of the lesson, questioning techniques, communication skills, employment of method/media, and instructor/student interaction.

(7) Lesson Observation Checklist. Evaluation instrument used to provide quality control and review effectiveness of instruction through the review of the MLF and the effectiveness of the lesson, activities, student

materials, media, etc. as observed during a convening lesson. Unlike the IEC, 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. It allows room for other comments by the observer, which may include recommendations to change the method, media, student materials, or learning setting. If the changes are minor, then they may be made immediately. Otherwise, data gathered from the checklist remains as documentation for the next convening CCRB. The frequency of observations can be determined in the Academic SOP. Additions can be made to this checklist to meet the needs of an individual school.

(8) Lesson Environment Checklist. This checklist reveals information about physical conditions and training conditions. If training takes place in a classroom setting, then information regarding lighting, noise, classroom setup, ventilation, room temperature, etc. is available through a learning environment checklist. This checklist can be completed by the instructor prior to the class or by a classroom observer during the class. It is the responsibility of the instructor to ensure that the media used for the lesson functions properly. A learning environment checklist 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 to eliminate the additional lesson safety review checklist.

(9) Lesson Safety Review Checklist. Evaluation instruments are used by instructors or the administration to ensure proper safety procedures are adhered to. This checklist is to be completed by the instructor or a qualified observer. The items on the checklist indicate whether the facility has been set up to present a safe working setting. It can also be used in addition to the lesson observation checklist to provide information on whether the instructor provided ample instructions regarding safety, emphasized safety, and practiced safety in the learning setting. It should also refer to emotional safety and students feeling safe to fully participate in the learning. Courses where students are exposed to potentially dangerous situations must ensure that RM Policy is referenced.

(10) Safety Questionnaire. Student reaction form used to provide evaluation feedback on safety within the learning environment. The Academic SOP may have specific guidelines about how this is assessed. Courses where students are exposed to potentially dangerous situations must ensure that RM is referenced.

(11) Practical Application/Class Exercises. Practical application and class exercises are evaluative tools that the instructor uses 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 schedule 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 "Comments" on the AIR for documentation.

(12) Assessments. During the Implementation Phase, there are several variations of how to appropriately assess the students (e.g. pre-test, written examinations, performance examinations). Each assessment has a different purpose. 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 assessment.

CONDUCT OF CONTINUOUS EVALUATION			
Evaluation Tool	Evaluation Purpose	When Conducted	Who Completes the Tool
Instructional Rating Form (IRF)	Student reaction form to instruction	During lesson	Student
After Instruction Report (AIR)	Consolidates the student reaction, instructor reaction, and assessment scores	After lesson	Course Chief
Examination Rating Form (ERF)	Students' perception of an exam’s suitability and fairness	Immediately following assessment	Student
End of Course Critique (ECC)	Reveals information on the course as a whole	End of course	100% of students
After Course Report (ACR)	Course Chief consolidates input from ECCs	After course	Course Chief
Instructor Evaluation Checklist (IEC)	Instructor is evaluated using the schoolhouse rubric	During lesson	Academics staff
Lesson Observation Checklist	Focus is on class content and effectiveness	During lesson	Curriculum developer; Academics
Lesson Environment Checklist	Reveals information about a safe learning environment	Before lesson; During lesson	Instructor; Classroom observer
Lesson Safety Review Checklist	Indicate whether the lesson provides a safe instructional/emotional setting for students	Before lesson; During lesson	Instructor; Classroom observer
Safety Questionnaire	Students have an opportunity to assess whether he/she was informed about safety issues	End of lesson	Student
Practical Application/Class Exercises	Evaluative tools that the instructor(s) use to assess the progress of students	During lesson	Student
Assessments	Administered IAW the POI and Academic SOP	Determined by curriculum	Student

Figure 8-10.--Conduct of Continuous Evaluation

c. External Deliberate Evaluation. Formal Schools should also have an established external evaluation plan to gauge course effectiveness. In accordance with Marine Corps policy, designated Course Chiefs will consistently monitor MCCLL information pertaining to their assigned course. Figure 8-10 provides a table that lists the evaluation topic, how the evaluation is administered, when it is conducted, and who completes the

instrument. The following resources are tools that Formal Schools can use to conduct external evaluations.

(1) Student Data Form. MCTIMS Student Registrar and Formal School Personnel Management modules are the starting points for information pertaining to this form. Any unanswered data can be obtained at the beginning of each course. A student data form completed by the student reveals background knowledge, computer experience, student expectations, language proficiency, and other input. This data can be helpful in determining why students do particularly well or not so well on an assessment.

(2) Post-Graduate Survey. Evaluation instrument to collect data from the graduates regarding a course previously attended. This survey is formatted like a questionnaire. Electronic surveys should be the primary means for surveying graduates. Mail is not the preferred avenue because many times it is difficult reaching many of the students once they graduate. The survey should be sent to course graduates approximately 90 days following the graduate's completion of the course. It is developed to assess how well the graduate felt that he/she was prepared for his/her job. It can also be designed to find out types of equipment being used, computer programs, content not covered, or suggestions/recommendations. For courses with extenuating circumstances where graduates are being delayed from performing the job (i.e. 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.

(3) Post-Graduate Supervisor Survey. Evaluation instrument to collect data from the supervisors of graduates regarding a course previously attended. This survey is formatted and distributed similar to the Post-Graduate Survey. It should be sent to the supervisors of course graduates approximately 90 days following the graduate's completion of the course. It is designed to gather information to evaluate the effectiveness of a course in preparing graduates for future duty assignments.

(4) Field Survey/Site Visit. Field Surveys/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. Setting, work conditions, and equipment can be viewed, while allowing school representatives to conduct interviews with supervisors and graduates. School representatives need to possess a thorough knowledge of the instructional programs related to the site in order 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.

(5) Marine Corps Center For Lessons Learned (MCCLL). MCCLL reports can provide valuable insight to the Formal School on emerging training requirements in the OPFOR. As a routine part of data collection, Formal Schools should ensure they are on the distribution list and review all reports that are applicable to their MOS/special skill. If the school identifies an emerging training requirement, Marine Corps policy provides business rules for collaborating with task analysts and OccFld Managers to validate the need and develop working readiness events to begin development of the learning solution. Requirements that are not time sensitive can be addressed in the FSER.

(6) Inspector General (IG). The TECOM IG conducts inspections of all Formal Schools according to their scheduled battle rhythm. This is a valuable opportunity for the school to have an external perspective on how it is maintaining the currency and quality of its courseware, the Formal School's compliance with rules and regulations for staff and faculty development and formal school evaluation, and employment of the formal school management capabilities in MCTIMS. Correction of discrepancies and formal findings will be addressed through a Corrective Action Report.

CONDUCT OF EXTERNAL EVALUATION			
Evaluation Topic	How Evaluation is Administered	When Conducted	Who Completes Instrument
Student Data Form	Reveals information about the student population	Day one of course	100% of students
Post-Graduate Survey	Assesses course content and how well the graduate felt that he/she was prepared for his/her job	90 days after completion of course	100% of students
Post-Graduate Supervisor Survey	Assesses effectiveness of a course in preparing graduates for future duty assignments	90 days after completion of course	Supervisors of course graduates
Field Survey/Site Visit	Interviews, surveys, and lesson observation checklists can be completed during the site visit	Anytime	Instructor; Curriculum Developer; Academics staff
MCCLL	Formal School ensures it is on the MCCLL Report distro list and the Course Chief's regularly review	As reports are received via e-mail	Course Chiefs or as directed by the CO
IG	Formal external inspection utilizing the Functional Area Checklist 400	Every two years	Inspectors are generally the Task Analyst for the Formal School

Figure 8-11.--Conduct of External Evaluation

4. Analyze, Interpret, and Summarize Data. 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. Once the data is analyzed and interpreted, it needs to be summarized and forwarded to designated staff members in a manner so that information supporting changes to the POI can be presented in a CCRB. An AIR is a good example of an evaluation tool used to consolidate IRF data and analyze, interpret, and summarize data.

a. Analyze Data. MCTIMS Formal School Personnel Management module provides student tracking based on the unit hierarchy structure used for formal courses/classes matching the organizational structure of the schoolhouses. There are numerous pre-defined rosters and reports built

within the application. In addition, there is the capability to customize rosters and reports. For instance, MCTIMS 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, MCTIMS 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 MCTIMS User Manuals located on the website for more information and guidance.

b. Interpret Data. 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. Use of 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. The key to performing statistical analysis is to understand the different statistical procedures, when to use them, how to use them, and how to interpret their results.

c. Summarize Data. The format of the data is at the discretion of the Formal School staff in order to codify the information in a logical and presentable manner (e.g. paragraph form, table, graph, chart, matrix). Strengths and problem areas are identified so that solutions can be formed and recorded. Any recommended solution should consider future goals and the feasibility of the change within the school. If revisions can be made to correct the identified problems, they should be made in a timely manner. The data collected should inform the CCRB, which can be Command directed if major changes are necessary.

5. Manage 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.

a. Record of Proceedings (ROP). The ROP documents evaluation results and recommendations for revising a POI identified during the conduct of a CCRB. It also functions as a record submitted to HHQ for implementing changes to a POI. If there are no recommended changes, then the ROP is simply maintained for documentation purposes at the school. The ROP also serves to initiate action at HHQ 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.

b. 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 MCTIMS and standard spreadsheet or database

applications can benefit from MCTIMS' ability to produce Student and Evaluation Data Export files for use in other applications.

c. Master Course Files (MCF). Schools must maintain MCF data, which can be electronic or paper-based. MCFs should be maintained for at least three years. By maintaining a MCF for each iteration of a course, all data regarding a particular class can be easily assessed for reviews, inspections, investigations, or CCRBs. The following documentation, at a minimum, should be maintained: T&R Manual or other service ITEs (for joint schools), POI (include Record of Changes and supporting documentation), MLF, ROP, and the Training Schedule. Per reference (b), as part of the Formal School Evaluation Plan other formative and summative data relevant to course review will include: test results (e.g. reports, statistics, item analysis), After Instruction Reports, End of Course Critique, graduation rosters, Master Course Schedule, CCRB materials, ROPs, POI Submission Letters, other documentation that directs change to the course (e.g. from HHQ, Advocates, Program Offices).

6. Course Content Review Board (CCRB). To collect, review and validate course content using data inputs from formative and summative evaluation data. The CCRB begins and ends the evaluation process for a given course. Information captured in the CCRB provides members of the T&R Working Group with a resource of data to use in the development of T&R events.

a. TECOM Directed. CCRBs are planned and conducted for each course of instruction or sub-course within a curriculum, at a minimum, once every three years. They are scheduled per the school's CCRB Battle Rhythm and focused on agenda items derived from formative and summative data. T&R event composition shall not be identified as an agenda item. Specified requirements can be found in reference (b).

b. Command Directed. Occurs when a T&R has been in use for some time and has been validated by POI execution. During this CCRB, a T&R change can be recommended via the out-of-cycle formal change process. It is similar to a TECOM directed CCRB, except the scope is limited to changes that are not T&R or resource related. It can also be conducted for the purpose of executing a Learning Analysis on previously modified T&R events. Nothing in this handbook precludes a Formal School from conducting any number of Command Directed course reviews during the three year CCRB Battle Rhythm.

c. Agenda Development. The focus and first priority of the CCRB should be to address agenda items derived from analysis of formative and summative data (e.g. IRFs, AIRs, ECCs, and Field Surveys). This is the bedrock of the Formal School evaluation process. The CCRB presents and votes on agenda items derived from analysis of data to make course adjustments.

(1) Development of the CCRB agenda is a crucial component in the success of the meeting. There are several key questions that influence the development of the agenda items, including who directed the CCRB and the overall stability of the T&R Manual and existing curriculum. If the CCRB was directed by TECOM, the primary agenda will be driven by formative and summative data, but will also determine the impact of the T&R events on the approved POI.

(2) CG TECOM does not require formative and summative data to be kept for historical purposes; however, Formal Schools will maintain the MCF specified documents within this chapter.

(3) Validation. T&R review and validation must be clearly defined. TECOM invests a significant part of the budget to conduct T&R working groups; therefore, it is not the purpose of the CCRB to redo the work conducted at these working groups. CCRBs should review the task list to validate that a specific course is teaching the right T&R events and look for the anomaly. An example is a specific event that may have been overlooked at the T&R working group that cannot be used in the Formal School until a change has been made to the T&R and approved for consumption in a POI. Formal Schools should work directly with their MTESD TA to identify these anomalies.

(4) CCRB Battle Rhythm. Formal CCRBs are planned and conducted on a three year battle rhythm based on the POA&M submitted by the Formal School and approved by HHQ. However, nothing in this handbook precludes a Formal School from conducting any number of command directed course reviews during the three year POI cycle based on the impact of those things which directly influence course change (i.e. change to T&R events, new equipment, changes to doctrine).

(5) Members

(a) CCRB Chair. Generally, the designated Course Chief, under the guidance of the Formal School Advisor (FSA), will be the CCRB chair and will ensure the CCRB is conducted in a fair and equitable manner. However, ultimately the decision of the identity of the CCRB Chair is the prerogative of the Formal School CO/OIC/DIR. This individual controls the meeting, ensures that all agenda items are discussed, voting is conducted if necessary, and that recommendations are recorded. The CCRB Chair 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 CCRB Chair should encourage and promote participation by all CCRB members. Contributions from all CCRB members should be treated respectfully and openly discussed among the board.

(b) CCRB Recorder. Under the guidance of the CCRB Chairman, the recorder should record all recommendations legibly. The ROP must clearly state CCRB findings and recommended courses of action in a detailed, concise format as identified by TECOM.

(c) CCRB Appointed members. CCRB composition is critical to success of the CCRB. CCRB members are appointed by the CO/OIC/DIR of the Formal School or as directed by the Academic SOP. To maintain the integrity of the process and provide formal courses that meet the needs of the OPFOR, the OPFOR must have sufficient representation to carry the vote on all CCRB agenda items. Appointed members will study all collected evaluation data and directions from HHQ that are related to the agenda items. They must also be prepared to discuss recommended changes to instructional materials. If revisions are necessary, members will determine the specific changes, discuss how they should be made, and decide 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. While the CCRB, in conjunction with a well-executed FSEP, garners extensive OPFOR/supporting establishment feedback on POI inputs and outputs, Formal Schools should invite SMEs from the following organizations to participate, as available, in CCRBs:

1. OPFOR representative(s).

2. OccFld Manager.

3. TECOM TA (to the maximum extent possible).

a. TAs should try to attend one CCRB at each of their Formal School/Dets annually, resources permitting.

b. The school and the TA should collaborate to decide whether the TA will be a voting or non-voting member in the CCRB.

c. Will advise CCRB Chair on matters pertaining to CCRB conduct.

(6) Record of Proceedings (ROP). Marine Corps policy mandates that evaluation results and recommendations for revising instruction at Formal Schools be documented through the publication of a 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 school. The ROP provides a summary of evaluation results, recommendations, and justification for revising training. For IG inspection purposes, the ROP is the only document that validates that a CCRB took place.

(a) Format. The required format for the ROP is provided by TECOM MTESD. It will include course revision data 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. It should also identify any required resource revisions in CDD items 21, 22, and 23. It will contain justification for any recommended revisions to instruction. The CCRB may make recommendations on revising instruction where appropriate.

(b) Member 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. At a minimum, all voting members and the CCRB Chair will sign the ROP certifying the accuracy of the content. Signature does not represent concurrence, and all in attendance should ensure dissenting opinions are captured within the ROP prior to signature.

(d) Submission. The final version of the ROP will be submitted to the CO/OIC/DIR of the Formal School as part of the POI submission process. In addition, a copy of the ROP will remain on file at the Formal School.

(7) Funding. It is the CO/OIC/DIR’s responsibility to fund the cost of travelers. If the Formal School has a requirement for additional funding for CCRBs, they should request it through the normal PPBE process.

(8) Joint CCRBs. If a specific TECOM MSC owns mirror-imaged POIs where all of the mirror-imaged schools belong to the same MSC (e.g. Sniper school) or for courses taught at multiple locations that include multiple MSCs (e.g. Marksmanship, MCCWS, MCMAP), the mirrored schools will submit the

POIs simultaneously and therefore require a Joint CCRB. In these cases, representatives from all Formal Schools or training venues that teach the respective course(s) will be convened to ensure curriculum content remains consistent between course locations. Amplifying information on mirror-imaged POIs can be found in reference (b).

7. Formal School Evaluation Plan (FSEP)

a. Overview. Reference (a) identifies the requirement for all Formal Schools to implement a FSEP. Personnel working in academics need to carefully consider the approach to evaluation. 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 they 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.

b. Requirements. Figure 8-12 is a graphic representation of what is taking place during the three year evaluation cycle of a POI. There are circumstances where emerging training requirements can dictate immediate changes to a POI through a Command directed CCRB or collaboration of the Formal School, Task Analyst, and OccFld Advocate. Marine Corps policy supports these immediate changes; however, if there are no such circumstances, the graphic accurately provides an example of formative and summative evaluation utilizing the tools and guidance provided in this chapter. The FSEP in the Formal School Academic SOP should provide text to amplify how the school conducts this process over the three year period. The billets represented below under the evaluation data process flow are examples, not policy. The CO/OIC/DIR and staff must determine what billets meet the specific needs of their school.

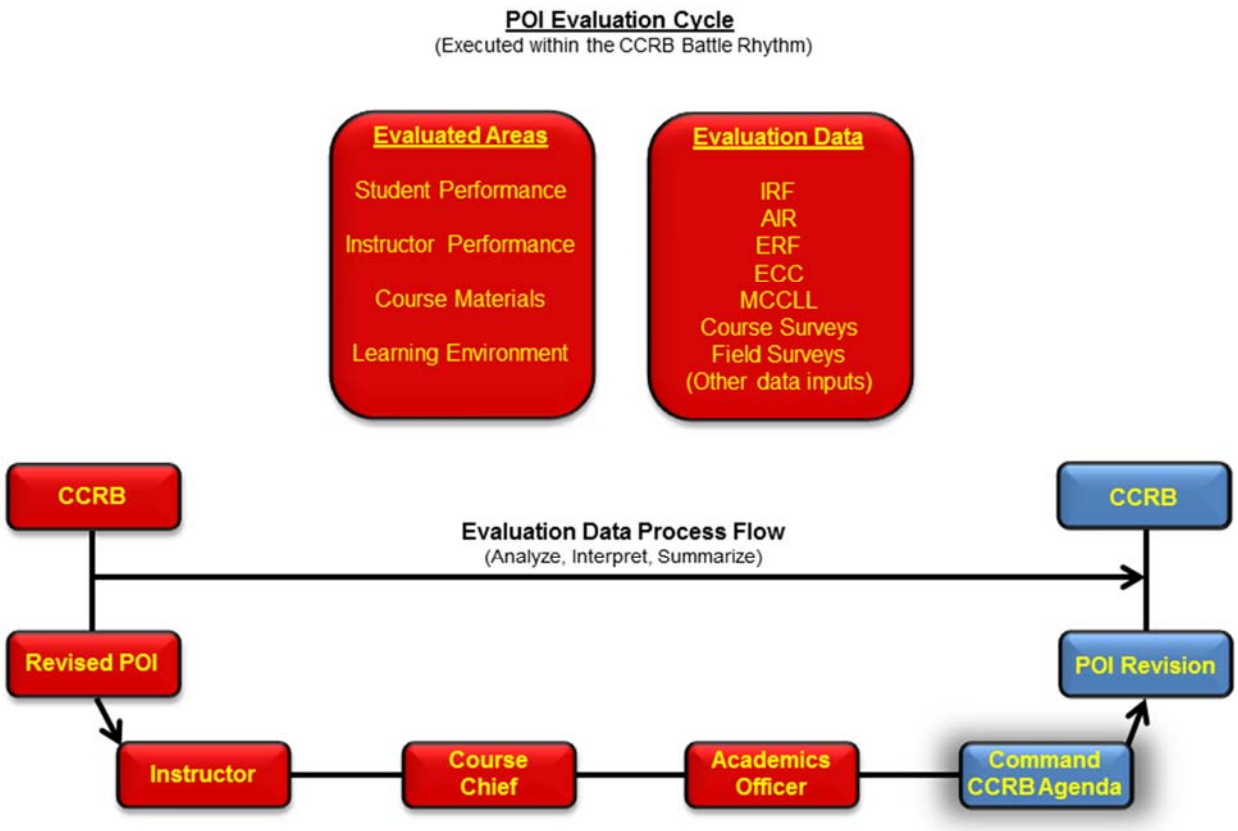

Figure 8-12.--POI Evaluation Cycle

c. Content. 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. Developing 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 focuses on the source of this requirement — Marine Corps doctrinal publications. 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.

(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 (assessment) data must be collected. If the focus concerns whether course graduates meet the needs of using commands, graduate on-the-job performance data is 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. For a HHQ directed evaluation (3 year required POI review) data for all four evaluated areas should be considered. Command directed evaluations will be “needs based” and may be focused on a specific evaluated area.

(2) Sources of Data. As part of the FSEP, guidance must be provided to 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 includes formative and summative data relevant to course review, such as all task and course materials (e.g. T&R Manual, POI, lesson plans), documentation that directs change to the course (e.g. from HHQ, Advocates, Program Offices), and previous evaluation data (e.g. AIR, ECC, graduation rosters, Master Course Schedules, CCRB materials, ROPs, POI submission letters).

(b) Data from individuals includes student performance data (e.g. test results, reports, statistics, item analysis), instructor performance data, and graduate performance data.

(3) Evaluation Schedule. The evaluation plan should indicate when the evaluation will 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. An evaluation should be planned to ensure timely collection of data.

d. Sampling. It is not always feasible to survey or test every member of a specific population. Therefore, a sample representative of the population can be selected for evaluation. There are sampling formulas that facilitate a more deliberate determination of a sample size; however, evaluators can also rely on their past experiences to select a sample size. 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 is too large to survey practically, so an evaluator focuses instead on a subset of the population known as a sample. When a sample is selected, it is important that the sample is 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.

(1) 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.

(2) Stratified Random Sample. A stratified random sample involves dividing the population into two, three, or more strata (e.g. rank, MOS) and then randomly sampling from each stratum. 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. 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.

e. 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 can assist in developing a useful survey tool.

(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 and 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.

(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 the Basic Rifleman course covering both M16 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. The response format of the questionnaire controls the way data is gathered, how it can be quantified, and the ease or difficulty of its 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 8-13 provides an example of a questionnaire response format.

QUESTIONNAIRE RESPONSE

Nominal Scale

1. Which of these qualities do you feel is the most important for an instructor to possess? (Circle the appropriate number below.)
    a. In-depth knowledge of subject matter
    b. Professionalism
    c. Sincerity

Ordinal Scale

1. 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.)
    a. Strongly disagree
    b. Disagree
    c. Agree
    d. Strongly agree

Interval Scale

1. How many personnel are assigned to your unit? (Circle the appropriate number below.)
    a. Under 50
    b. 50-75
    c. 75-100

Open-Ended

1. What do you feel is the most important information you received while attending the Supply Officer Course?

_____

_____

Figure 8-13.--Questionnaire Response Format (Example)

(e) 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 8-14 provides 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?

Figure 8-14.--Guidelines for Writing Questionnaire Items

(f) Distribution. In addition to well-written questions, valid results from survey questionnaires depend on the selection of respondents. The sample should include respondents assigned to each using location in the population.

1. When to Send Questionnaires. Proper timing is important when sending questionnaires. For example, questionnaires (e.g. post-graduate surveys) should be in the graduates' hands at least 90 days after graduation and assignment to the using command. Beyond 90 days, 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.

2. 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 FSEP. These would include the timing of the follow-up, a method for identifying non-respondents, and the method of follow-up (e.g. phone, email). 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 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. Figures 8-14, 8-15, and 8-16 identify types of questions, advantages, and disadvantages when conducting interviews.

(a) 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.

(b) Probing or Clarifying Questions. A question that confirms a respondent's answer or clarifies 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.

(c) Closed Questions. A question that limits respondents' answers to predetermined response categories is a closed-ended question (e.g. Multiple choice, Yes/No 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 or age. 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 record responses using the exact words and phrases used by the respondent or use key words or phrases to further clarify a response or as a reminder of what was said. Figures 8-15 thru 8-17 provide examples of how to conduct an interview and the advantages and disadvantages associated to it.

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. ☑ If asked, either suggest all possible responses to a question or do not suggest any. ☑ 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 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.

Figure 8-15.--Conducting the Interview

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 8-16.--Interview Advantages

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 8-17.--Interview Disadvantages

(3) Evaluation Instruments. Various instruments are typically used when the evaluation consists of a review of documentation, course materials, or an observation of performance. These instruments are not simply lists of items that can be "checked off" as they are identified or located. They should consist of carefully worded questions that the evaluator answers by reviewing course materials or observing course components (i.e. graduate or instructor performance, conduct of a class). These instruments, among others, can be used to conduct both formative and summative evaluations of an instructional program.

(a) Formative Evaluation. During curriculum development, instruments can be used to ensure instruction is proceeding according to plan. The use of evaluation instruments helps the evaluator ensure that the materials being developed (e.g. learning objectives, test items, lesson plans, student materials, learning setting, media) will result in an effective and efficient course of instruction. An audit trail is created that enables evaluators to track each component of the instructional program to the T&R event it supports and to document the method followed. To create an audit trail, a progress or process method can be used.

1. Progress Method. This method is used to keep management informed of the progress of the course development effort. In consultation with course manager(s) (e.g. FSA, Academic Officer, Course Chief), 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. 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.

2. Process Method. This method describes and documents 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 procedures as well as steps or processes not completed should be

documented. The important information to be captured is the explanation of any deviations so that future managers will know what was done during course development.

(b) Summative Evaluation. During a summative evaluation, various instruments 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. The primary areas of evaluation are course content and course materials, student performance, instructor performance, and learning environment. Per reference (b), at a minimum all data collection tools should provide evaluation data on these four areas.

1. Course Content and Course Materials. Course materials (e.g. lesson plans, student materials, media, and 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. In addition, a review of course materials should include course control documents (e.g. POI, ROP). Course control documents provide an administrative check of how the course is being implemented in support of the T&R.

2. Student Performance. Evaluation instruments, such as checklists or rubrics, are commonly used in performance tests where students are rated on mastery of learning outcomes/objectives. Various instruments can be created for instructors to use while observing student performance during written or performance assessments.

3. Instructor Performance. Instructors are commonly evaluated and rated by students through IRFs and course critique questionnaires. An evaluator can use approved evaluation tools during observation of a class to record data on the instructor's ability to effectively present the materials in the lesson plan. These tools can also be used to assess the instructor's qualifications.

4. Learning Environment. An evaluator can use various evaluation tools to determine whether existing instructional facilities are meeting the requirements of the instructional program. The evaluator should first review the course requirements for instructional equipment and facilities. Evaluation of the learning environment should include appearance, 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 remains operable.

8. Continuing Professional Development

a. Overview. Formalized training and education requirements provide the skills necessary for Formal School academic staff and faculty to fulfill a position. Continuing professional development is of the utmost urgency to the school in order to improve methods and practices, sustain requirements, and find efficiencies that will ultimately drive to mission success of the school.

b. Marine Corps Instructor Mastery Model (IMM). The adoption of the IMM – reference (q) - has laid a foundation for the professional development of instructors and contains the below Key Performance Areas (KPA) necessary to

reveal important shifts and transitions that must occur as enablers for movement throughout the various stages of development.

(1) Instructional Technique. Knowing and applying a variety of methods and strategies to secure student attention, enhance student participation, facilitate learning, and the ability to select and adapt approaches based on learning goals and the student population.

(2) Setting the Example. The mental, physical, and character traits of an individual who embodies USMC values and ethos, demonstrates professionalism and command presence, garners respect and trust, and displays passion and commitment to the job.

(3) Communication and Delivery. Clear, concise, dynamic and interactive exchanging of information to transfer knowledge and promote understanding using a combination of verbal, nonverbal, and other communication approaches.

(4) Self-improvement. The motivation to continually increase domain knowledge and enhance instructor skills by actively seeking and engaging in a variety of knowledge and skill acquisition activities.

(5) Developing Subordinates and Peers. Establish relationships with students and peers to mentor, coach, advise, and guide their development.

(6) Planning and Preparation. Review, generate, and adapt teaching materials to rehearse instructional delivery and proactively plan the administration and logistics of a course based on learning objectives, the role of the course within the institution’s progression of instruction, and anticipated student characteristics and questions.

(7) Learning Environment. Establish and maintain the conditions for a respectful, engaging, and motivating atmosphere that encourages active collaboration by managing time, physical space, and student behavior.

(8) Assessing Effectiveness. Know and apply formal and informal assessment techniques to gauge the effectiveness of the instruction, accurately verify student knowledge, and provide performance feedback to students.

(9) Subject Matter Expertise. Maintain technical and tactical proficiency in course content and associated principles to be regarded as a credible source of information and apply that knowledge and experience to facilitate learning.

(10) Community of Practice. Actively contribute to enhancing the collective body of instructional expertise, examine organizational practices and processes to achieve desired learning outcomes or objectives, and socialize recommendations for improving institutional and service-wide methods to meet USMC standards. For civilian staff and faculty, this should include participation in the Community of Interest (COI) sponsored by TECOM for those individuals assigned to 1700 billets. Also, where possible, attend professional conferences, seminars, and symposia. CO/OIC/DIRs should consider professional development when prioritizing TAD funds for the year.

APPENDIX A

KNOWLEDGE BASED TEST ITEMS

TRUE/FALSE TEST ITEMS (ADVANTAGES AND LIMITATIONS)
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 testing period.
4. Complex objectives 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.

Figure A-1.--True/False Test Items (Advantages and Limitations)

TRUE/FALSE TEST 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?		

Figure A-2.--True/False Test Items (Checklist)

TRUE/FALSE TEST ITEMS (EXAMPLE)		
Enabling Learning Objective: Without the aid of the reference, given an M4 carbine service rifle, associated equipment and ammunition, identify “make safe” procedures in accordance with the reference.		
Test Item: When given the command to “make safe,” the shooter will place the M4 carbine service rifle in Condition 3.	**True** ____	**False** ____

Figure A-3.--True/False Test Items (Example)

MULTIPLE CHOICE TEST ITEMS (ADVANTAGES AND LIMITATIONS)
Advantages
1. Learning objectives 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. Score can be influenced by reading ability.

Figure A-4.--Multiple Choice Test Items (Advantages and Limitations)

MULTIPLE CHOICE TEST ITEMS (EXAMPLE)
Enabling Learning Objective: Without the aid of reference, select in sequence the basic steps for performing preventive maintenance on the M4 carbine service rifle. **Test Item:** In sequence, select the basic steps for performing preventive maintenance on the M4 carbine 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 A-5.--Multiple Choice Test Items (Example)

MATCHING TEST ITEMS (ADVANTAGES AND LIMITATIONS)
Advantages
1. A compact and efficient form is provided where the same set of responses fit a series of item stem (e.g. 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 objectives 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.

Figure A-6.--Matching Test Items (Advantages and Limitations)

MATCHING TEST ITEMS (CHECKLIST)		
	YES	**NO**
1. Is this type of item appropriate for measuring the intended learning objective?		
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?		

Figure A-7.--Matching Test Items (Checklist)

MATCHING TEST ITEMS (EXAMPLE)

Enabling Learning Objective:

Without the aid of reference, identify the individual components of the three main groups in an M4 carbine service rifle per the reference.

Test Item:
Column A contains the three main groups of the M4 carbine 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 A-8.--Matching Test Items (Example)

LISTING TEST ITEMS (ADVANTAGES AND LIMITATIONS)
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. Scoring is contaminated by spelling ability. 3. Scoring is tedious and time-consuming.

Figure A-9.--Listing Test Items (Advantages and Disadvantages)

LISTING TEST ITEMS (CHECKLIST)		
	YES	**NO**
1. The student should always be told the number of items to be listed.		
2. A listing test item can cover a complete procedure; such as, the steps in the process of disassembling the M16.		
3. 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 was being tested on failure to fire procedures before going to the rifle range, then “in sequence” would be very important.		
4. Provide blanks of the same length at a length long enough for the student’s answers.		

Figure A-10.--Listing Test Items (Checklist)

LISTING TEST ITEMS (EXAMPLE)

Enabling Learning Objective:

Without the aid of reference, list in sequence the steps in disassembling the M4 carbine service rifle.

Test Item:
List in sequence the steps in disassembling the M4 carbine service rifle.

_____ _____ _____
_____ _____ _____
_____

Figure A-11.--Listing Test Items (Example)

FILL IN THE BLANK TEST ITEMS (ADVANTAGES AND LIMITATIONS)
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 objectives.

Figure A-12.--Fill in the Blank Test Items (Advantages and Limitations)

FILL IN THE BLANK TEST 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?		

Figure A-13.--Fill in the Blank Test Items (Checklist)

FILL IN THE BLANK TEST ITEMS (EXAMPLE)
Enabling Learning Objective: Without the aid of references, describe in writing the performance characteristics of the M4 carbine service rifle in accordance with the reference. **Test Item:** The maximum effective range of the M4 carbine service rifle is _____ meters at individual/point targets and _____ meters at area targets.

Figure A-14.--Fill in the Blank Test Items (Example)

SHORT ANSWER TEST ITEMS (ADVANTAGES AND LIMITATIONS)
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 objectives.

Figure A-15.--Short Answer Test Items (Advantages and Limitations)

SHORT ANSWER TEST ITEMS (EXAMPLE)
Enabling Learning Objective: Without the aid of references, describe in writing the performance characteristics of the M4 carbine service rifle in accordance with the reference. **Test Item:** State the cyclic rate of fire for the M4 carbine service rifle.

Figure A-16.--Short Answer Test Items (Example)

LABELING TEST ITEMS (ADVANTAGES AND LIMITATIONS)
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.

Figure A-17.--Labeling Test Items (Advantages and Limitations)

LABELING TEST ITEMS (CHECKLIST)		
	YES	**NO**
1. Make all sketches, drawings or illustrations clear and of sufficient size. If possible, use the actual parts of a unit.		
2. Provide sufficient information to indicate what the equipment is and which part is to be labeled.		
3. The parts to be labeled or identified should be clearly pointed out by using lines or arrows.		
4. Ensure that only one definite answer is possible.		

Figure A-18.--Labeling Test Items (Checklist)

LABELING TEST ITEMS (EXAMPLE)
Enabling Learning Objective: Without the aid of references, label the components of the M4 carbine service rifle in accordance with the reference. **Test Item:** Label the components of the M4 carbine service rifle in accordance with the reference. NOTE: Based upon the ELO, the appropriate graphic is required for labeling test items.

Figure A-19.--Labeling Test Items (Checklist)

ESSAY TEST ITEMS (CHECKLIST)
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.

Figure A-20.--Essay Test Items (Checklist)

ESSAY TEST ITEMS (EXAMPLE)
Enabling Learning Objective: Without the aid of references, describe in writing the proper procedures for conducting a function check for the M4 carbine service rifle. **Test Item:** Using 100-200 words and in essay format, describe in writing the proper procedures for conducting a function check for the M4 carbine service rifle.

Figure A-21.--Essay Test Items (Example)

APPENDIX B

PERFORMANCE-BASED TEST ITEMS

PERFORMANCE CHECKLIST

Enabling Learning Objective: Without a reference, given an M4 carbine service rifle, disassemble the weapon in 30 seconds in accordance with proper procedures identified in the reference.

Test Item:

1. Instructions to the Evaluator: Ensure you have an adequate training facility to conduct testing. Inform the students that they have 30 seconds to disassemble the weapon following proper procedures. 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. 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 weapon. You have 30 seconds. You will be evaluated using a performance checklist detailing the disassembly procedures of an M4 carbine service rifle in accordance with the reference. 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. Do you have any questions? You may begin.

3. Performance Checklist	YES	NO
a. Cleared the rifle.	___	___
b. Removed the sling.	___	___
c. Removed the handguards.	___	___
d. Detached upper receiver from lower receiver.	___	___
e. Removed charging handle and bolt carrier group.	___	___
f. Disassembled bolt carrier group.	___	___
g. Removed buffer assembly.	___	___
h. Disassembled the weapon in 30 secs or less.	___	___

Figure B-1.--Performance Checklist

STEPS FOR DEVELOPING PERFORMANCE-BASED TEST ITEMS
1. State the performance objective as a brief description of what the student must accomplish for successful completion of the performance test.
2. Determine if the relationship between the learning objectives is dependent, supportive, independent, or conflicting.
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.

Figure B-2.--Steps for Developing Performance-Based Test Items

PERFORMANCE-BASED TEST ITEMS (ADVANTAGES AND LIMITATIONS)
Advantages
1. Can evaluate complex learning objectives 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.

Figure B-3.--Advantages and Disadvantages of Performance-Based Test Items

APPENDIX C

ADULT LEARNING - TIPS FOR TEACHING

1. Introduction. This Appendix is designed to provide expanded information about topics that were covered briefly in Chapter 3 of this document. The information here builds on the introduction of the topic to provide a deeper view for the faculty member to consider when preparing for a course. As faculty members, professional development should always be part of the role that is being fulfilled. The information provided here, just as in Chapter 3, is not all-inclusive and serves as a starting point for further progression.

2. Knowles's Assumptions (CH. 3, PARA 3.C.)

a. As referred to in the Adult Learning Chapter, there are two sets of assumptions that Knowles laid out with regards to learners. The first he referred to as assumptions of pedagogical learners. This is what is referred to in the chapter as Basic Learner assumptions. This means that learners who exhibit these characteristics are learning at the basic level. It also means to the developer, that if these assumptions match their curriculum, then they are developing for only the basic level. There are five assumptions of the basic (pedagogy) learner:

(1) The learner is dependent on the teacher or trainer.

(2) The learner enters into an educational activity with little experience that can be used in the learning process. Newly minted Marines are put into a system that they know little about. The training continuum is new to them, and is as important for them to understand as the material being taught.

(3) People are ready to learn when they are told what they have to learn in order to advance to the next grade level or achieve the next salary grade or job level. In the early stages of a Marine's career, they are focused on the next step in their skills progression, or rank. For example, telling a Marine they must be able to perform a set of skills in order to be awarded a particular MOS.

(4) People enter into an educational activity with a subject-centered orientation. This assumption is similar to the previous, in that the learner is primarily focused on what the subject is, and not so much on what it means to them.

(5) People are motivated to learn primarily by external pressures from parents, teachers/trainers, employers, the consequences of failure, grades, certificates, etc.

b. The second set of characteristics put forth by Knowles were those of the adult learner (andragogy). The shift in learning should transition for the learner to pull away from the assumptions (basic learner) above, to those in line with the adult or experienced learner. It is important to note that the responsibility of learning transitions to being a shared responsibility between the teacher and student.

(1) The learners feel the need to learn.

(2) The learning environment is characterized by physical comfort, mutual trust and respect, mutual helpfulness, freedom of expression, and acceptance of differences.

(3) The learners perceive the goals of a learning experience to be their own.

(4) The learners accept a share of the responsibility for planning and operating a learning experience, and therefore have a feeling of commitment towards it.

(5) The learners participate actively in the learning process.

(6) The learning process is related to and makes use of experience of the learners.

(7) The learners have a sense of progress toward their goals.

3. Personality Tests/Learner Style Inventories (CH.3, PARA 3.D.(5))

a. In Ch. 3, it was pointed out that there are many types of personality traits, and learner styles that faculty should plan for. Just the same, there are many instruments that are used for assessing characteristics of learners. Resources for these are in Appendix E.

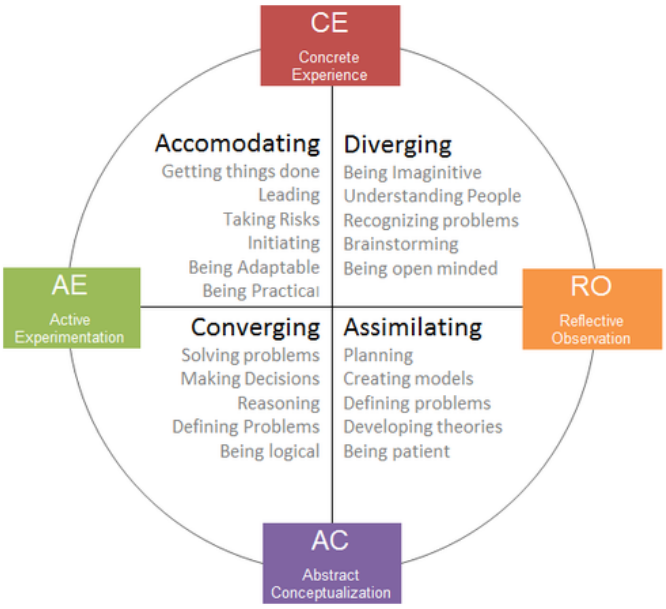

Figure C-1.--Learning Style Inventory (LSI)

b. One such instrument is the Learner Style Inventory (LSI) by Kolb. It describes four stages that a learner can be in, referring back to the learning cycle. Since people use all four stages in many learning situations, Kolb used combined scores to determine which of four learning styles an individual preferred (Cooper, 2009). The utility of the LSI is so that learners and their instructors are able to know their style of learning, in order to improve their learning experience. It may be impractical for a curriculum developer to predict LSI results in the future, they should look to Kolb’s work in order to know and understand that each Marine will learn

differently. Developers can assist the instructors by building into the courses the availability to allow for learners to learn their style as they build their educational foundation.

c. Understanding the four different types of learning styles from Kolb means that as developers and instructors, there is an understanding that not all courses will match perfectly to the students. However, what this does say to the instructor and developer is that the methodology chosen should be variant in order to reach the difference in learner. It is important to note that just as there is variability of learning styles among learners, they do not stay in the same style, but rather rotate through them. Understanding the students that we are teaching is crucial to being able to create an environment in which they learn.

4. Physiology (CH.3, PARA 3.E.(3))

a. Physiological needs should be met to ensure that the student is focused on what is being taught. The human body physiologically can be primed for learning or can counter act learning. In addition to such human factors listed in the chapter, listed below are other aspects of physiology impact adult learning.

(1) Blood. The gravitational pull of the Earth is a constant that we all live with. The pull has an effect within our bodies as well as upon our bodies. For example, we lose ½ inch each day and get it back after staying flat while we sleep. The force of gravity naturally draws oxygenated blood away from the brain as the locus of learning in the human body. This constant pull is easily seen when Marines pass out in formation. Why did they pass out? They locked their knees and thus rested on their skeletal system rather than contracting the immense leg muscles that in turn serve to pump blood back up to the brain. Seated adults gain 15% more oxygenated blood in their brain by doing calf raises in place. Standing adults (with knees unlocked) gain 30% more blood in their brain. Marine Corps instructional systems should seek ways to keep blood up in the brain.

(2) Water. The brain is a complex network of information raceways and pathways connected by neurons. These neurons serve as the building blocks of the nervous system, transmitting information to and from the brain and throughout the body. Electric impulses travel these networks for thinking, memory, and coordination of both conscious and unconscious body movement and function. The brain has about 85 billion of these neurons (give or take), each connecting to others by a gap called a synapse. The synapse conducts the electric impulses from one neuron to the next because of water based substance. Shortages of water in the body dry up these gaps and prevent the impulse to travel forward—forcing the use of less efficient “back roads” in the brain. Intoxication manifests this in readily apparent ways. An intoxicated person or one suffering from severe dehydration has slurred speech, uncoordinated partial movements and degraded overall function. All this is due to lack of water in the brain. Other diuretics such as caffeinated coffees or energy drink trade temporary stimulants for less water in the body—and in the brain. Water resupply in the field not only helps to prevent injuries, but also promotes the human ability to learn. MCISD should seek to keep water or other helpful sports drinks available for adult learners.

(3) Light. Humans are daytime creatures, meaning we crave light. We are physiologically primed to sleep when it is dark. A dark classroom or a

dark night debrief in the field will automatically become a challenge for humans to pay attention to. This is due to a darkness sensitive production of a hormone in the body called Melatonin. This “sleep chemical” naturally induces sleep. Too much TV or device screen time before bed or too much sunshine during the day can reduce the body’s ability to produce this chemical, making it difficult for people to fall asleep. More to the point, the challenge is to find ways to counteract this Melatonin production through light in classrooms and breaking out lights for that field debrief.

5. Active Learning (CH. 3, PARA 3.C.(2))

a. Developing curriculum for implementation into MCISD can be challenging at times. Silberman (2006) outlines eight qualities of an active training design that a developer can look to for assistance in creating curriculum that is more active in nature, than passive.

(1) Moderate Level of Content. The content level in training can often be referred to as the fire hose effect. At times, instruction simply attempts to cover too much material for the time given or the level of student being taught. Curriculum Developers should be selective when choosing the objectives for a course. Prioritizing the need to know, ensuring it is covered, before the nice to know.

(2) Balance among Affective, Behavioral, and Cognitive Learning. Active training involves a three-pronged approach: fostering attitudes, developing and practicing skills, and promoting understanding of the concepts and models behind the subject. This is particularly important among military training, because we are concerned that students learn what is being taught, but also that they are able to perform the skills in a proficient manner. Practicing skills provides the opportunity for the instructor to utilize feedback during the training evolution, and even in the classroom. An example of this is the use of personal response systems in lecture classes. The instructor asks the class a question, they input their responses, and the results are displayed. This allows the students to see how their answer compared to their peers (McKeachie & Svinicki, 2014).

(3) Variety of Learning Approaches. Particularly important in adult learning, is changing the methodology of what is being taught. Adult learners learn in different ways and choosing one method of instruction may not reach all learners in the classroom. As discussed previously with Kolb’s views on learning styles, it is important to use a variety in order to engage the preferences of the learner, but also engage, holistically, the individual.

(4) Opportunities for Group Participation. Utilizing group or collaborative learning fosters a movement in learning from passive to active. Remember, it is about engaging the students and pulling them away from strict, regimented passive learning when possible.

(5) Utilization of Participants’ Expertise. In order to take advantage of learners’ relevant experiences, there needs to be room in the design for incorporating them. In active learning, it is common for peers to learn from one another.

(6) Recycling of Earlier Learned Concepts and Skills. Military training is about building upon prior foundations of learning. In designing curriculum it is important to reinforce prior learning as much as possible in

order to allow the learner to review what has already been learned, and to apply it to new and more challenging tasks. This also works to mitigate students only learning for the short-term.

(7) Real-Life Problem Solving. One of the benefits of active learning should be the emphasis of real world application. Adult learners, as mentioned before, like to know that what they are learning has real-world applicability. In designing curriculum, and in implementation, educators should provide opportunities for application during learning. This will give the information being taught immediacy and enable the learners to assess the utility of what they are learning on the spot.

(8) Allowance for Future Planning. Students may find themselves asking, “Now what?” as the period of instruction or training curriculum ends. Active training designs have this in mind, and should be able to consider the next steps the students will take, and how their learning will transfer to their job. Providing students with opportunities to identify how the material presented in your courses might be useful to them, now or in the future, as they strive to reach their own educational, personal, social, or occupational goals can enhance motivation as well as cognitive effort (Acee and Weinstein, 2010).

b. Retention of learning is best supported when the learner is actively engaged rather than passively receiving. An example of passive learning is found in a large classroom with little to no interaction between the lecturer and the learners throughout a presentation. The learners merely let the information soak-in, rather than doing anything with it. They neither process it nor interact with the lecturer. Much of the presentation is, therefore, lost on the learners because they were not required to process. Particularly for higher level learning across the KSA domains, learners must be provided discovery learning opportunities through well-facilitated problem-based or inquiry-based learning activities. The large classroom lecture with an active learning approach produces a much better and lasting impact through extensive interaction, in-class processing activities such as problems to solve using the new information, or some other form of practical application with the information.

c. Over time, learning, particularly on the lower levels of the three domains, tends to fade without repetition and sustainment. For example, after two weeks, learners tend to recall only 10 percent of what they read, 20 percent of what they hear, 50 percent of what they see and hear on location, 70 percent of what they say, and 90 percent of what they do without further sustainment (see figure B-2)

Figure C-2.--Dale's Cone of Learning

6. Transformative Learning (CH. 3, PARA 4.C.(3))

a. In addition to Silberman's views on Transformative Learning, are those of Kegan. Whereas Silberman's thoughts are more of a guide for developing active learning into a curriculum, Kegan's is more of a sanity check. Kegan's features should be used to delineate whether or not the aim of transformative learning is being met. Transformation may not happen all at once, depending on the depth of the change occurring, or how anchored the student was in that point of view.

b. Kegans' features of Transformative Learning.

(1) Transformative kinds of learning need to be more clearly distinguished from informational kinds of learning, and each needs to be recognized as valuable in any learning activity, discipline or field.

(2) The form that is undergoing transformation needs to be better understood. If there is no form there is no transformation.

(3) At the heart of a form is a way of knowing (what Mezirow calls a "frame of reference"); thus genuinely transformational learning is always to some extent an epistemological change rather than merely a change in behavioral repertoire or an increase in the quantity or fund of knowledge.

(4) Even as the concept of transformational learning needs to be narrowed by focusing more explicitly on the epistemological, it needs to be broadened to include the whole life span. Transformational learning is not the province of adulthood or adult education alone.

(5) Adult educators with an interest in transformational learning may need a better understanding of their students' current epistemologies so as not to create learning designs that unwittingly presuppose the very capacities in the students their designs might seek to promote.

(6) Adult educators may better discern the nature of learners' particular needs for transformational learning by better understanding not only their students' present epistemologies but the epistemological complexity of the present learning challenges they face in their lives.

c. Mezirow's (2000) 10-step Outline Process for Implementing Transformative Learning.

(1) Experience a disorienting dilemma.

(2) Undergo Self-examination.

(3) Conduct a deep assessment of personal role assumptions and alienation created by new roles.

(4) Share and analyze personal discontent and similar experiences with others.

(5) Explore options for new ways of acting.

(6) Build competence and self-confidence in new roles.

(7) Plan a course of action.

(8) Acquire knowledge and skills for action.

(9) Try new roles and assess feedback.

(10) Reintegrate into society with a new perspective.

d. These ten steps share many similarities with the aim and experiences of entry level training, specifically recruit training. Fortunately, or unfortunately for service-members, military training and life offer many opportunities for disorienting dilemmas. Training beyond that of entry level may not offer the disorienting dilemma that recruit training offers. Throughout military service, however, one may encounter instances where what they seem to already know or understand is not the case. This difference in what was perceived and reality becomes the disorienting dilemma required for this type of learning.

7. Mapping The Learning Experience (CH. 3, PARA 4.D.(2))

a. In the Transfer of Learning, Applying the learning experience, section of Chapter 2, the LEARN model was discussed as a method to assist in planning for retention of learning. These are really components that are applicable across settings of learning and even across methods. They do not need to be implemented in order, nor do they all have to be used. Each is a component that will assist in promoting retention in the learner.

(1) **L**ink to experience. Previous knowledge and experience is an essential piece to learning anything new. Our lessons should always reach

back to previous experiences and provide new experiences to give the learners a basis from which to learn.

(2) **E**ngage learners attention. Get the learners to engage in the lesson. This means they are forced to think, solve problems, and become curious to learn the meat to the lesson.

(3) **A**ctivity. Learners must be active in your lesson. They must do something with the material covered. Allowing them to simply absorb your wisdom is inadequate to all learners.

(4) **R**eflection. Learners also need to reflect on their experiences and activities, on the ideas presented, and on their own work with those ideas in order to learn during a lesson.

(5) **N**ext Steps. Any lesson should help learners prepare for the next lesson. This is particularly important for subjects that are addressed by multiple lessons over several lessons such as a lecture followed by a discussion group or TDG and then a STEX or FEX/FFEX. Learners should at least be alerted to the evaluation that follows.

b. Some personality types are driven because there are two different types of learners due to brain hemispheres. This consideration results in a left and right hemisphere dominated variation of each personality type. Thus, there are eight unique learners with unique learning needs in our audience as noted in Figure B-3. To be the most effective in helping all learners learn, we must find a way to plan for and meet all their unique needs as part of the lesson. In short, learners must hear the instructor say what needs to be learned, they must see the learning, and then they must do something with it. In order to plan lessons effectively for these adult learners, MCISD should apply a systematic method for addressing all eight types of learners in our audience. A method of doing so is represented below, with McCarthy's 4MAT technique. It steps through the process, and also demonstrates or shows which are connecting to Left (L) brain learners and Right brain (R) learners.

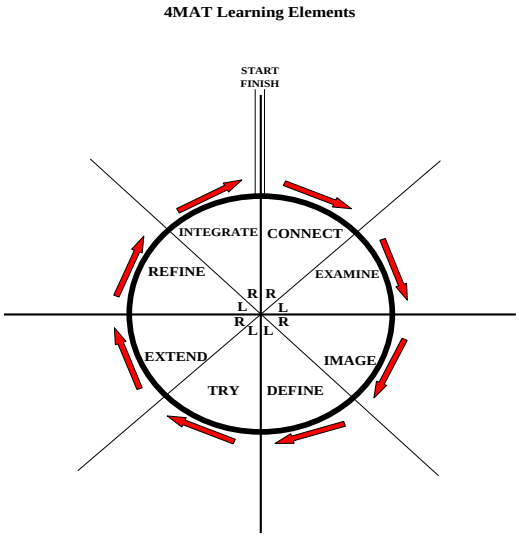

Figure C-3.--4MAT Learning Elements

(1) Link to Experience. Connect to the learners through a shared concrete experience. This is done through starting a lesson with problems to solve, case method, TDGs, or simple questions to answer. Previous learning and experience also are drawn upon from past lectures, discussions, TDGs, STEXs, FEXs, etc. This should gain the student's attention through directly or indirectly indicating the relevance to them as well as encourage or include note taking, and indicate some level of accountability, such as the discussion to follow the experience.

(2) Examine with the learners to draw out their reactions and inferences from the shared concrete experience as related to the lesson key points/learning objectives to be instructed.

(a) Image. Provide a reoccurring image and theme to return to while illustrating the learning objectives. This may be as simple as reemphasizing the concrete experience used to connect with the learners through tying reoccurring images throughout the lesson as well as related examples back to the concrete experience.

(b) Define the subject matter for the learners. This is often the meat of the lesson and in many of the poor lessons we have endured, the only element that exists. The key is to sustain the image while tying back to the "connect" and "discuss" while presenting the subject matter.

(3) Activity

(a) Try. The learners need to do something with the subject matter presented. This helps them internalize it and make abstract conceptualization more real. This is in essence a guided practice which is mainly the responsibility of the instructor. Simple questions that return to the concrete experience that tie the subject matter with the experience may be all that is necessary. Alternatively, learners may follow along with the instructor guiding learners through a step by step process such as construction of a fire plan sketch or plotting a point on a map.

(b) Extend. The learners need to take the concepts learned from "define" and "try" and extend them into a new problem or situation. This is the structured practice where the instructor sets up a new problem for the learners to solve. This problem could be a new case study, new TDG, new question to answer, etc.

(4) Reflection

(a) Refine. This follows the extend activity enabling learners to clarify and refine their understanding through discussion guided by the instructor. Learners present their solutions or ideas from the extend activity and receive feedback both from peers and the instructor.

(b) Integrate. This element of instruction brings the student's learning during the whole of the lesson into focus ranging from the concrete experience used to connect with learners through the refinement that occurs following the last activity.

(5) Next Steps. The learning is linked as well during this element of the lesson to integrate the learning experienced during the lesson with the overall instructional plan.

c. The actual process of putting these elements together does not match the start to finish of implementing the lesson. At all times in this process, the developer must consider the learning required. What are the driving learning objectives or learning outcomes that are to be addressed? The figure below shows another process of planning a lesson. The process is cyclical and alternates between Learning and:

(1) Define. First begin by laying out the material to be defined. Find the critical elements that need to be reinforced and clarified from the student handout, but do not regurgitate all.

(2) Try. Plan guided practice where the student can try to use the learning presented or covered in define. This activity is characterized by a great deal of instructor involvement and is typically individual student effort.

(3) Connect. Construct the concrete experience using problems, TDGs, questions, or case studies (which may include video clips) to both link to previous student experience and provide a common experience to all learners at the start of the lesson. Design must illustrate the relevance to the learners, indicate accountability, and encourage note taking leading to the "examine."

(4) Examine. Devise the guiding questions that the instructor will use to help learners examine the "connect." The questions and student interaction feeds into the rest of the lesson.

(5) Extend. This should be a new problem or a variation of the main problem set that is being instructed. Learners are given structured practice where they are more responsible for the learning. Compared to the "try", the instructor is less involved in leading the learners through the steps, but still sets the activity up, supervises, and assists individual learners when necessary. This activity may be done collaboratively with peers or individually.

(6) Refine. This should be similar to the "examine," but with learners presenting their solutions to the extend activity.

(7) Integrate. This is again the opportunity to wrap all the concepts and learning experiences in the lesson together as well as the opportunity to tie into the next steps.

(8) Image. By this point, all the threads of the lesson should be in place and the whole picture should be clear of what image and theme to carry throughout.

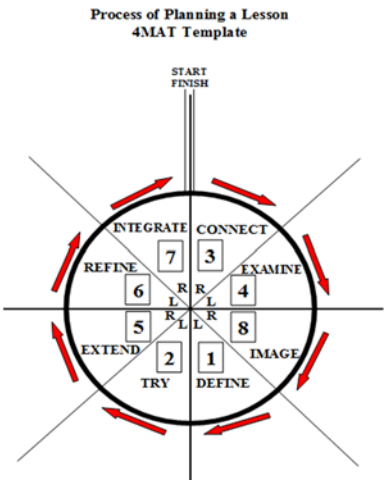

Figure C-4.--4MAT Process of Planning a Lesson

8. Four Stages of Self-Directed Learners (CH.3, PARA 5.C.)

a. Gerald Grow (1996) references four stages that the student will find themselves in, when it comes to self-direction, and learning. It should be the goal of every instructor and developer to prepare Marines to receive the training at hand, but also to advance to higher stages of learning and thinking in the future. Grow's four stages of learners are described below (Grow, 1996).

(1) Stage 1 - Dependent. In this stage, the learner is dependent upon the authority and coaching of the teacher. This is a staged learner whereas drill, lecture, and coaching with immediate feedback are appropriate. This would be reflected in the primary stages of training for Marines where they are new to the subject matter and have little to no experience in the area.

(2) Stage 2 - Interested. This learner responds to a teacher that is a motivator, and a guide in their learning process. Guided discussion and inspired and interactive lectures are most helpful. This staged learner is ready to set goals, and contemplate their own learning strategy. They respond to motivational techniques. They are willing to do assignments they can see the purpose of. They are confident but may be largely ignorant of the subject of instruction. These are what most schoolteachers known as "good students" (Grow, 1996).

(3) Stage 3 - Intermediate. These learners have skill and knowledge. They see themselves as participants in their own education. They will even explore some subject matter on their own. These learners also begin to analyze and examine themselves, and learn and identify their own experiences in life. Successful stage three learners develop critical thinking and foster initiative. To teach these learners, the teacher is more of a facilitator. Teacher and student share in the decision making, and this should encourage students to use their skills that they have acquired.

(4) Stage 4 - High Self-Direction. These learners are able to set their own goals and standards-with or without help from experts. These learners are able to take responsibility for their learning, direction and

productivity. At this stage, it is not the educator's role to strictly teach these learners, but to cultivate their ability to learn.

b. The important item to note is where the responsibility of learning lies in each of the stages. In Stage 1, the student has little responsibility. They are completely dependent upon the teacher. The teacher filling this role should be in or have a position of authority and coach. They will help the student overcome. This contrasts Stage 4 Learners that are self-directed. They are capable of working on their own, and have a lot of control over the direction of their learning.

c. Perry's Scheme of Intellectual and Ethical Development. William Perry devised nine developmental positions of a learner. He wanted to understand how students thought, and what the impact of education had on the ethical and intellectual development of the learner. In addition to the nine positions, Perry felt that learners also progressed through four major stages of intellectual and moral development (Perry, 1970). The four stages are: Dualism, Multiplicity, Relativism, and Commitment. Listed below are the stages, with their associated positions. In addition to these are transitions from the perspective or mindset of the learner. These transitions provide insight or thoughts that could provoke the learner into moving toward the next stage.

(1) Stage 1 - Dualism. Basic Dualism refers to there being right and wrong answers. The thought that all problems are solvable, and that the job of the student is to figure out or learn what those correct answers are.

(a) Position 1-Basic Dualism. The position that the learner takes here is that the "Authority" knows. Authority can mean a textbook, an instructor, a mentor, etc. Simply put, it is the belief that those Authorities know the answers and are there to provide the answers. The learner feels their purpose is to follow the Authority, and learn from them. Knowledge is measured by the amount of answers the learner can get right.

Transition: But what about those Others I heard about? And different opinions? And Uncertainties? Some of our own Authorities disagree with each other or do not seem to know, and some give us problems instead of Answers.

(b) Position 2-Full Dualism. True Authorities must be Right, the other Authorities, then, must be wrong. Good Authorities give the learner problems so they can learn to find the right answer through their own independent thought.

Transition: But even Good Authorities admit they don't know all the answers yet. If the learner has to search for answers, then perhaps too, the Authority has to look for answers as well.

(2) Stage 2 – Multiplicity. Multiplicity discusses knowledge that is subjective. The learner is now exposed to conflicting answers and has to make decisions on which one to trust-the Authority or themselves.

(a) Position 3 - Early Multiplicity. There are usually two issues in early multiplicity. The first problem is considering whose answers

the student knows. The second are those that the student doesn't know. The student then is left with the task of having to figure out how to find the right solution.

Transition: But there are so many things the Authority doesn't know the answer to. And they won't have the answers for a long time.

(b) Position 4a - Rebellion. In this step, the learner realizes that the Authority does not have all the answers and are fallible at times. Therefore, realizing everyone's opinion can be valid. Learner still takes or accepts answers from the Authority but does not believe them as the sole expert. The alternate side to this is that students in this phase can be confused by the difference in evaluating quantity vs. quality.

Transition: But some of my friends ask me to support my opinions with facts and reasons

(c) Position 4b - Playing the Game. In this position, the student tiptoes close to autonomy but does not commit to it. They figure that if they tell Authorities what they want to hear then that is the same as giving them the right answer. Even if the student believes that the Authority does not have all of the answers, they still feel the Authority controls most of them.

Transition: But this way seems to work in most courses, and even outside them.

(3) Stage 3 - Relativity. At this stage, the student is being placed into autonomous situations. They are entering a place where the Authorities can no longer be counted on to provide the answers. This stage has the learner seeing a balanced point of view in that while Authorities do not have all the answers, they may have the most experience, and the most factual background.

(a) Position 5 - Contextual Relativism. The proposed solution, when the learner is in this stage, is that every solution must be supported by reason and context. Some solutions will be better than others. The point for this stage is that the student is able to learn to evaluate the solutions.

Transition: But if everything is relative, am I relative too? How can I know I am making the Right Choice?

(b) Position 6 - Commitments in Relativism Foreseen. The student continues to transition towards autonomy and sees the need for commitment. They have had practice at evaluating and choosing solutions and are getting better at being able to choose on their own. The student here begins to become more proactive than reactive. Decisions are coming from the student, not the Authority.

Transition: I see I am going to have to make my own decisions in an uncertain world with no one to tell me I am Right. I am lost if I do not. When I decide on my career (or marriage or values) everything will straighten out.

(4) Stage 4 - Commitment. The Commitment stage is the last of the four main stages laid out by Perry. This stage is where the learner is able to integrate the knowledge they have gained with their experience, and combine those with reflection upon them. Though Perry leaves a lot to desire in Positions 7-9, these levels reflect the student finding their place through personal commitment.

(a) Position 7 - Commitment. At this stage, the learner makes an initial commitment in an area.

Transition: Why didn’t that settle everything?

(b) Position 8 - Challenges to Commitment. After making an initial commitment, the student begins to explore and make commitments in new areas. They realize they have made several commitments and need to balance them.

Transition: Things are getting contradictory. I can’t make logical sense out of life’s dilemmas.

(c) Position 9 - Post-commitment. The student begins to accept that there is uncertainty in life. They are able to live through ambiguity. They are able to make decisions based on their values, weighing various solutions.

d. This is intended to show faculty that there are stages that a learner goes through, and a process to learning how to make decisions. “Because I said so,” may work on a Kindergarten student that is not ready to challenge authority or even question it. That may not work as well with an adult learner or someone in the workplace. Adult learners and Marines need context. They need external information to weigh potential solutions and be able to make sound decisions.

9. Memory and Information Processing (CH.3, PARA 5.D.)

a. Picture an enormous library with unlimited space for books on countless book shelves; all with a surprisingly small in-processing desk to review, categorize, and code each book for addition to the library according to guiding frames or procedures. As the books are being in-processed at this desk, the guiding frames or procedures may need to be revised to account for new additions that do not fit. Frequently, the in-processing desk must draw from or check the existing collection in the library to speed the in processing of new books (for example, to determine to which collection the new book should be added). Sometimes the in-processing desk must make sense of unorganized pages to a book that arrives and which must be put together prior to storage.

b. As mentioned, in Chapter 2 Figure 2-7, attention allows the brain to focus on pertinent information. Faculty must set an inviting instructional climate and engage learners to keep their perceptual register (think of blinds on a window) open to the five senses. Keeping these “blinds” open takes charismatic, patient, and credible faculty. It is the opening of these “blinds” that allows information to move towards long-term memory.

c. In order to facilitate this, faculty must leverage the fundamental prioritization that occurs in the short term memory. Think of short-term memory as the clipboard. The brain has priorities, and new learning is at the tail end of the list. New learning takes focusing learners brain like using a flashlight in a dark room, through attention. Learner attention is best supported through relevance, accountability, and note taking. The act of taking notes gets learners doing something while also engaging the auditory, visual, and kinesthetic areas of the brain. This forces summarization to put concepts into the learner’s own words simultaneously.

d. The working memory is like a work table. Information coming in is processed, and readied for long term storage or dropped. Recalled information is clarified, refined, and readied for return to long term storage. Like any work table, there are limits to the number of information structures that can fit at one time. Just as more stacks of organized papers fit on a table than scattered lose sheets of paper, the working memory needs information that is organized into structures. What this means to faculty is that they should consider no more than seven information structures and shift structures in 20 minute intervals.

e. At the long term memory stage, the file cabinet information is stored by differences during period of sleep. Stored information is recalled as needed by similarities. Faculty can assist moving information to long-term storage by connecting new learning to previous experiences. Much like writing a paper with several revisions necessary from outline to final, the long-term file on a subject needs to be stored and recalled repeatedly over several periods of sleep. This permits the clarification and refinement necessary to fill out the conceptual “file” of declarative or procedural information stored in the memory. The impact for faculty is to consider the first the need for reinforcement and repetition even if conceptually through projects, writing assignments or physical practice. Review of upcoming course schedules adjusted for holidays or otherwise, should include ensuring that chained lessons addressing a similar topic area are separated by days, rather than all on one day. Faculty engagement supporting information processing leverages the nuances of the human memory to maximize learning within Marine Corps instructional systems.

f. Working memory is like this narrow in-processing desk—only capable of handling a few groupings of information at once. The guiding frames or procedures are mental models or “deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action. Entrenched mental models (or habits of mind)… thwart changes” that may be necessary for learning to occur. We must encourage openness to new ideas or ways of thinking about previously established norms in order for learning to meet minimal resistance when processed.

g. The rest of the unlimited library space is the long-term memory. Learners can process at the working memory more rapidly when the new information is both connected to previous experience--the existing “book

collections" in the brain (thus making the learning meaningful) and is also organized into a small number of conceptual/procedural structures (7 +/- 2) with each structure presented and attended to in limited time engagements (20 minutes). Learners can process at the long-term storage more rapidly when repetition pushes the information into "hard wired" pathways that become automatic—this is known as automaticity. For example, after moving to a new duty station a Marine must write a new address and phone number multiple times before it becomes hard wired. At first it is very difficult to recall such declarative information without reference, but over time and repetition, the information is easily and automatically recalled. Likewise, Marines learning to perform Marine Corps Martial Arts and Combat Marksmanship skills repeat them multiple times while learning them and through follow-on sustainment in order to push the techniques into automaticity—moving from conscious and deliberate procedural thought to unconscious and automatic skill (e.g. the "muscle memory"). This automaticity enables Marines to perform well in combat despite the fog, friction, fear, etc. that pervade war.

10. Social Learning/Apprenticeships (CH.3, PARA 5.E.)

a. Apprenticeships existed first during the guild era of the middle ages and the renaissance. The guild system started with an apprentice who learned a trade from a master practitioner. After developing sufficient competence, the apprentice was ready to leave the master and become a journeyman in the trade. This same model is valuable in MCISD particularly in the preparation for a specific billet or role. A social learning version of apprenticeship is a relationship of shared trust and responsibility for learning between the learner and the faculty. The apprenticeship is comprised of:

(1) Articulation. The instructor asks questions to get the learner to reveal gaps in thinking, rationale, or approaches to role or billet type problems.

(2) Coaching. The instructor provides supportive guidance and assistance to the learner to improve performance.

(3) Modeling. The faculty provides the example as well as showing the learner through various demonstration means the techniques, procedures, or examples to follow. This may range from providing an example themselves, or one to follow such as a paper/order, rock drill, or a weapon or system operation, etc.

(4) Scaffolding. Faculty should consider that the learning that must occur for the "apprentice" is like building a house. Scaffolding provides support in the framing and construction of a house which is eventually taken down/ taken away. Similarly, scaffolding for learning is provided by faculty in the form of expectations, priorities or otherwise early in the relationship and slowly taken away.

(5) Increasing Complexity/Difficulty. At this point, the faculty begin handing off responsibility for learning to the "apprentice." This normally is not a simple or quick step, but occurs over time throughout the relationship.

(6) Reflection. Thinking back about what was learned in a guided way with prompts for the learner to discuss mistakes and lessons learned, with

guided peer interaction and feedback as well as faculty coaching particularly after the event has concluded.

(7) Exploration. This phase entails cultivating learners that can continue to learn on their own. Faculty should where possible refrain from answering every question, building the independence in learners to seek answers for themselves.

11. Additional Tips

a. The paragraphs that follow below are not direct extensions of items found in Chapter 3. They are additional information and tips provided to faculty in MCISD to increase their knowledge and development as such.

(1) Mastery vs. Progress. Learning structures for behaviors lend themselves to a mastery learning orientation. This means that learners must exhibit observable behaviors that are evaluated to a concrete or abstract standard. Anything that can be seen can be measured. Some behaviors will be more tangible permitting objective evaluation while other behaviors will be intangible, requiring subjective evaluation. Learning structures for mental associations are more difficult to measure. Behaviors related to the mental association provide windows into these inner changes and permit direct or inferred measurement. For example, a course learning outcome to be a man or woman of exemplary character cannot be seen just be looking at a learner during any moment in time, but throughout garrison and field lessons, liberty choices, and billet performance, the collection of observed behaviors provide a means for inferred assessment. The long-term purpose of such course learning outcomes provides a guiding function to faculty and an aspirational goal for learners. Mastery of such learning outcomes is not feasible to determine in the relatively short periods associated with Marine Corps instructional systems, however positive progress is possible to measure and determine. Learning structures for mental associations then lend themselves to a progress learning orientation.

(2) Zone of Proximal Development. To build competence for the requirements of the job, which in our case are the MOS and common learning requirements for expeditionary readiness, experience gained through exposure to the learning environment is planned and resourced to achieve the desired effects in learners. In order to generate the maximum impact, the learning must be on the mark relative to the learner's past experience and learning needs while remaining as challenging as possible to build interim competence toward the long-term vision. Learning is targeted at the zone between reality and the just manageable area closer to the goal (see figure X2-3). This just-manageable difficulty elicits the ideal learner challenge arousal—positive anxiety that results during learning from a situation in which a learner perceives a probability of success with a significant yet reasonable amount of effort;[i] this, in turn, supports an outward focus on the learning. A learning environment which is too advanced for learners is in danger of overwhelming and negating the individual's sense of self-efficacy—the degree to which the learner feels capable of successfully changing the intended behavior. The loss of this may cause the learner to simply give up. A learning environment that is too basic or laborious relative to the learner's previous experiences is in danger of boring the learner; which moves the learner's focus inward away from the learning. Therefore, the learning environment must be tailored specifically to meet the needs of the learners or group of learners with common learning goals. This collection of learners is called the TPD.

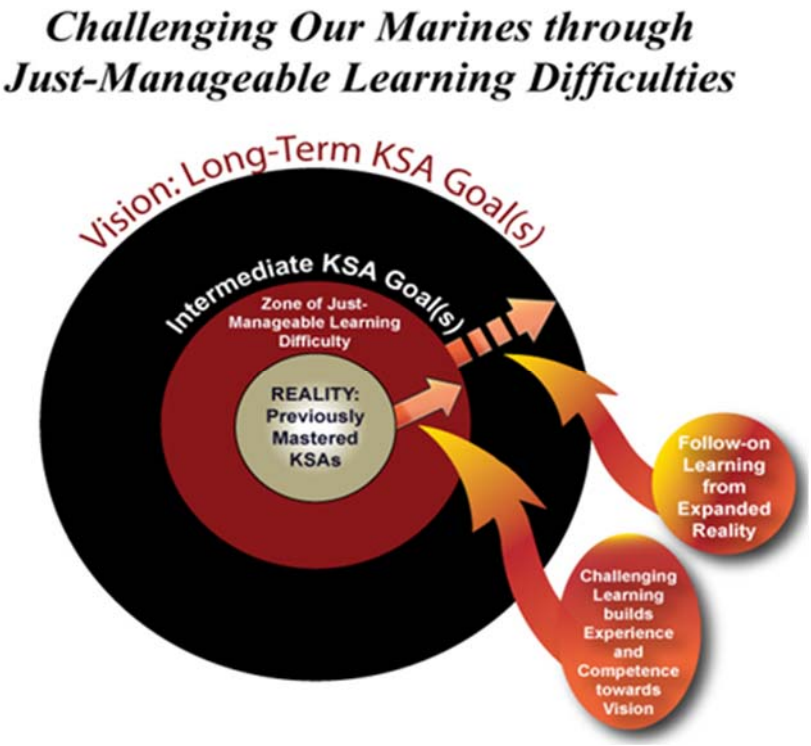

Figure C-4.--Just Manageable Learning Difficulties

12. CLASSROOM MANAGEMENT

a. Classroom management is about setting the conditions for a consistent focus on learning in our classrooms whether those classrooms are in a lecture hall, discussion room, around a sand table, around a repair station, or out in the field. To do so we must consider our principles of interaction with learners first, engage learners to prevent misbehavior, and react to misbehavior in ways that keep focus on learning.

b. Misbehavior is any behavior that is inappropriate for the setting or situation in which it occurs. It is further useful to consider that misbehavior is any behavior that through intent or thoughtlessness: Interferes with instruction or learning; threatens or intimidates others; and oversteps standards of conduct.

c. Misbehavior most frequently occurs with learners that are not engaged actively in learning during instruction. We as faculty may inadvertently support current and future misbehavior by allowing a shift or loss of focus on the learning through: poor instructor professional example, lack of prevention skills, poor reaction to misbehavior as it occurs during instruction, and/or poor time management skills.

d. We first must shape our thinking about how we interact with learners, then consider the goals of all our instruction (not just content or objective specific), and finally consider standards of instructional ethics and professionalism. Following these starting points we will then consider how we might prevent and react to misbehavior in ways that keep the focus on learning.

13. Principles of Working with Adult Learners

a. As Marine leaders serving in a faculty role, it may seem easy to direct learners or impose your authority to keep your lessons on track. However, this is not the ideal approach to working with adult learners. We will discuss ways to prevent and respond to misbehavior more specifically later.

b. The principles of working with adult learners are:

(1) Maintain focus on the major task for learning while instructing

(2) Know what causes misbehavior and how to deal with it

(3) Understand adult learners' needs and how to meet them

(4) Give up trying to coerce learners

(5) Treat all adult learners as your social equals

(6) Teach/relate to adult learners in a charismatic way when able

(7) Involve learners meaningfully in lesson decision-making

(8) Establish a positive set of tactics for preventing and responding to misbehavior

c. Prevention Tactics. At our disposal are specific skills which enable us to attend to all the learners in our classroom in ways that keep them engaged on the task and focused on the learning. When adult learners are engaged and focused, they are less likely to misbehave.

(1) Time Management. Managing time available against time needed for various learning tasks. Mismanagement of time is critical for the impact it leaves on the learners.

(2) Smoothness. Keeping lesson presentation or execution moving smoothly and seamlessly through well-orchestrated transitions so that learners are not abruptly directed from one element or activity to the next. This minimizes distracting or disturbing incidents and keeps learners engaged and focused. For example, smoothness encompasses transitions between slides or concepts in a lecture just as much as one drill to the next during a field exercise or combat conditioning.

(3) Classroom Structure. Avoid time-wasting through well planned classroom structures that prompt learners to action with minimum required time or communication. These structures may be opening routines in garrison lessons, or field routines such as the conduct of debriefs.

(4) Group Alerting. Using effective systems for gaining attention and clarifying expectations without unnecessary and time consuming direction and explanation. For example: an instructions slide on screen in a lecture classroom that prompts learners to being work on a warm-up problem as they are taking their seats.

(5) Momentum. Much like a movement to contact, a lesson should gain and maintain momentum to help keep learners on track. Move at the right pace for learners without wearing them down.

(6) Satiation Avoidance. See to it that learners are not over exposed to a particular subject/information structure as they will eventually become “full” and need to move on to another topic or activity. In a garrison environment, a good rule of thumb is about 20 minutes to a topic after which a break is in order or a smooth transition to a new topic.

(7) With-it-ness. Faculty needs to know what is going on in all parts of the classroom at all times. This situational awareness is essential to detecting learners with questions, unmet needs, or those slipping from engagement in the task or slipping in focus on the learning. Reading the audience helps feed this with-it-ness, knowing which learners are engaged or when the group is approaching satiation. Eye contact, body language, and tone of voice from learners’ responses all provide input beyond just what faculty see across the whole of the classroom whether in the field or in garrison. Some examples, the “with-it” faculty notices that several learners are puzzled by the last example used, some learners in the back have tuned out and are staring into space, that the left flank of the patrol has drifted too far away, or that the unit leader has neglected to keep the unit on the route briefed through poor land navigation skills… and then takes action to get learners back on track.

(8) Overlapping. Faculties that manage their classrooms effectively are able to attend to two or more events simultaneously. Prevention and reaction to misbehavior takes constant focus on the learners, the learning environment/climate and the curriculum to be instructed all while facilitating the lesson so as to keep learners engaged and focused. A faculty member teaching a concept is capable of answering a learner’s question while moving through the classroom to non-verbally prompt others to reengage in the lesson is using the overlapping technique.

(9) Attention. Keeping learners engaged means holding them accountable (in the moment, alerting them to the exam, and to the operating forces leading Marines connection), indicating and making the relevance meaningful to them, and providing them prompts and means to actively take notes. The relevance in particular is essential—do not underestimate the power of purpose. Tie all instruction back to the mission/intent and to the Marines they will serve and lead.

(10) Challenge. Effective classroom managers challenge their learners with just manageable difficulties. Start the lesson with a question, problem, or puzzle that challenges prior knowledge and experience and engages learners immediately. Use Say, See, Do teaching where the learners hear you say something, they see the concept/skills, and then they get to do something with it.

(11) Classroom Layout. Organize classrooms so that the instructor can reach and see every learner. TDGs, discussions, debriefs, etc. should be formed in a horseshoe with the learners oriented away from distractions. During classroom projects or group work, the faculty members should be able to reach every learner by using an interior loop—which allows free access to all.

(12) Provide Efficient Help. Give learners a visual alert with any instructions and then when helping individuals; be positive, be brief, and be gone. For example, for a TDG the map graphic and instructions are written on the dry erase board and then read to learners with the scenario. Questions from learners about what is required are directed to the visual alert on the board. Questions from learners on their ideas are given brief positive comments with rapid identified areas for improvement and the instructor quickly moves on— these force learners to engage and not rely on the instructor for extensive assistance.

(13) Adaptive Execution. Effective classroom managers are adaptive in their ability to adjust instruction to best support the learners. If learners are approaching satiation on a topic the instructor adapts the plan to transition to a new topic while being sure to follow up on the part missed later in the lesson. The curriculum is established to meet the learning demands of readiness—not about content or the faculty's wishes. Adaptive execution is *not about changing the curriculum* for the needs of the learner, it *is about changing the instruction* to meet the needs of the learner. Such changes are departures from the norm and may take the form of additional questions to the learners, analogies, examples, in the moment sequencing changes, etc.

(14) Use Positive Reinforcement. When learners perform or behave as we expect, provide positive reinforcement such as incentives or appreciative praise. This makes learners more interested in doing the right thing. In essence, we need to "catch" adult learners "being good."

d. To sum up prevention, it is brought about through our own subtle interpersonal skills and instructional skills that we employ during our lessons. In essence we seek to get learners motivated to engage in learning through cultivating their self-discipline and a meaningful sense that the learning is valuable to them.

e. Focusing on the Learning/Reacting to Misbehavior. Reacting to misbehavior must be done in ways that keep all other learners focused on the learning. Below are some positive tactics that subtly influence learners to correct misbehavior on their own:

(1) Supporting self-control

(a) Eye contact. Just making eye contact may sometimes be enough to help the learner reconsider their actions. This sends signals to a learner.

(b) Physical proximity. While this is more difficult in some classrooms, moving to stand near the learner in question may be all that is needed. This physical proximity prompts the learner back on task.

(c) Humor. Sarcasm is defined as "a sharp or ironic utterance designed to cut or give pain." Humor is defined as "the mental faculty of discovering, expressing, or appreciating the ludicrous or absurdly incongruous; something that is comical or amusing." Sarcasm should be avoided in the classroom if it is oriented at learners since it detracts from human needs and intrinsic motivation. Humor on the other hand is powerful for the emotional connections it provides both in support of learning and in support of reacting to misbehavior. Using humor in the latter case may be to the effect of a general announcement to all the learners in the classroom

humorously addressing individual misbehavior without belittling any learner in particular.

(d) Encouragement. Assure learners that you believe they can support their own self-control. This should be assertive, polite, and positive rather than directive and negative.

(2) Situational Assistance

(a) Hurdle Help. Provide scaffolding to help learners over learning or behavior obstacles. Provide expectations, indicate resources available such as a visual instruction alert plan or the Commander' Tactical Handbook, and help set the conditions for the student to succeed.

(b) Restructure/Reschedule. Adapting the lesson to prevent or react to misbehavior in order to keep learners engaged in the learning and remain focused on the learning.

(c) Remove Distracting Objects. Be an honest custodian of a tech gadget, device, or other distracting object that is interfering with the learner's focus until the lesson is over. In a live fire setting this may be pyrotechnics or if safety is violated, ammunition.

(d) Remove the Student from the Situation. If the learner cannot get back on track, remove them from the situation until you are able to talk with them privately—while keeping the other learners on track and engaged. Use effective communication to coach the student through the correct action. Get the student back into the situation as soon as possible.

(3) Appraising Reality.

(a) Tell it Like it is. Give them the reality check. Use same side cooperation to solve the problem.

(b) Set Limits. Whatever helped to cause the problem should be limited in access.

(c) Use Congruent Communication. Communication that is harmonious with the situation best supports a focus on learning. Sometimes we need to be caring that are helping learners to correct themselves. Sometimes we are Marine leaders that need to set subordinate learners straight.

(d) Use Guided Choice. Give the learners two choices and allow them to decide which to pursue.

(e) Enable Student to Save Face. Do not escalate the situation. Help them learn by supporting them with counsel and coaching privately if necessary.

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[i] Challenge arousal is the positive anxiety that results during learning from a situation that a learner perceives a probability of success with a significant yet reasonable amount of effort. Challenges also stretch learners to learn new limits. Ormrod, Educational Psychology 4th ed: Developing Learners, Part 2, Chapter 11, pp. 380/pp. 392.

APPENDIX D

ONLINE RESOURCES

ONLINE RESOURCES	
PURPOSE: To provide online resources for Formal School academic faculty and support personnel and to allow rapid modification and access to these resources to receive the most up to date version.	
Inspector General Checklist	
DESCRIPTION: Formal Schools will be inspected by the TECOM CGIP using the 1553.2 Formal School Management checklist. The current checklist is updated regularly and are available through the Inspector General of the Marine Corps web site at: http://www.hqmc.marines.mil/igmc/Resources/FunctionalAreaChecklists.aspx.	
Department of the Navy – Naval Forms Online	
DESCRIPTION: Future revisions to the below forms will result in many of them no longer being NAVMC Forms. For standardization, ensure to only use those forms located on the MTESD Sharepoint site (identified below). NAVMC Forms can also be found at: https://navalforms.documentservices.dla.mil/web/public/forms.	
NUMBER	**TITLE**
NAVMC 11755	AFTER INSTRUCTION REPORT
NAVMC 11757	LESSON ENVIRONMENT CHECKLIST
NAVMC 11758	PROGRAM OF INSTRUCTION CHECKLIST
NAVMC 11759	INSTRUCTIONAL RATING FORM
NAVMC 11760	LESSON SAFETY REVIEW CHECKLIST
NAVMC 11761	END OF COURSE CRITIQUE
NAVMC 11762	INSTRUCTOR EVALUATION CHECKLIST
NAVMC 11763	LESSON OBSERVATION CHECKLIST
NAVMC 11764	POST GRADUATE SUPERVISOR SURVEY
NAVMC 11765	SAFETY QUESTIONNAIRE
NAVMC 11766	POST GRADUATE SURVEY
NAVMC 11768	EXAMINATION RATING FORM
NAVMC 11769	LEARNING ANALYSIS WORKSHEET
NAVMC 11770	LEARNING OBJECTIVE WORKSHEET
NAVMC 11771	CONCEPT CARD
NAVMC 11896	RISK ASSESSMENT WORKSHEET
NAVMC 11899	RISK ASSESSMENT MATRIX
MTESD Sharepoint Site	
DESCRIPTION: The below documents are additional resources that are avaialable on the MTESD Sharepoint site located at: https://vce.tecom.usmc.mil/sites/directorates/mtesd/SitePages/Home.aspx	
NUMBER	**TITLE**
	LEARNING ANALYSIS WORKSHEET CHECKLIST
	LEARNING OBJECTIVE WORKSHEET CHECKLIST
	MASTER LESSON FILE REQUIRED ITEMS CHECKLIST
	CONCEPT CARD CHECKLIST
	LESSON PLAN CHECKLIST
	EXAMPLE LESSON PLAN
	STUDENT OUTLINE CHECKLIST
	TEST CHECKLIST
	TEST ITEM CHECKLIST
	METHOD SELECTION GRID WORKSHEET
	MEDIA CHECKLIST
	INSTRUCTOR PREPARATION GUIDE CHECKLIST
	ACADEMIC SOP CHECKLIST

Figure D-1.--Online Resources

APPENDIX E

ADULT LEARNING RESOURCES

ADULT LEARNING RESOURCES

PURPOSE: To provide online resources for Formal School academic faculty and support personnel and to allow rapid modification and access to these resources to receive the most up to date version.

MTESD Sharepoint Site

DESCRIPTION: The below documents are resources that provide the approved verbs for task titles. They also provide a partial source of verbs for learning objectives and task performance steps. The use of standard, well-defined verbs provides clarity, prevents duplicate work, and aids in providing quality training. These documents are available on the MTESD Sharepoint site located at: https://vcepub.tecom.usmc.mil/sites/directorates/mtesd/SitePages/Home.aspx.

TITLE	DOCUMENT
SECTION I	STANDARD VERB USAGE
SECTION II	VERBS TO USE WITH CAUTION FOR T&R EVENTS AND TLOS
SECTION III	VERBS WITH SIMILAR DEFINITIONS
SECTION IV	VERBS NOT TO BE USED

Additional Resources

TYPE	TITLE	AUTHOR	INFO (ISBN)	WEBSITE (IF AVAIL)
Article	A categorized list of motivation definitions, with suggestions for a consensual definition	Kleinginna and Kleinginna	1981	Motivation and Emotion, 5, 263-291
Article	Active learning: An introduction	Felder, R.M. Brent, R.	2009	ASQ Higher Education Brief, 2(4)
Article	Active learning: Creating excitement in the classroom	Bonwell, C. C., Eison, J. A.	1991	https://www.ydae.purdue.edu/lct/HBCU/documents/Active_Learning_Creating_Excitement_in_the_Classroom.pdf
Article	Adult learning theory: It matters. In Teaching management: A field guide for professors, consultants, and corporate trainers, Chapter 3	Clawson, J. G., Haskins, M. E.	2006	Cambridge: Cambridge University Press (pp. 34-48)
Article	Audio-Visual Methods in Teaching	Dale, E.		http://ocw.metu.edu.tr/file.php/118/dale_audio-visual_20methods_20in_20teaching_1_.pdf
Article	Beyond training: New ideas for military forces operating beyond war	Cornell-d'Echert, B.	2012	New Directions for Adult and Continuing Education, 2012(136), 17-27. doi:10.1002/ace.20032
Article	Cultivating Intuitive Decision Making	Krulak, C.C.		http://www.au.af.mil/au/awc/awcgate/usmc/cultivating_intuitive_d-m.htm
Article	Designing TDGs	Scmitt, J.F.		MC Gazette, Volume 80, Issue 5

Adult Learning Resources (Page 2)				
TYPE	**TITLE**	**AUTHOR**	**INFO (ISBN)**	**WEBSITE (IF AVAIL)**
Article	Effects of a value reappraisal intervention on statistics students' motivation and performance	Acee, T. W., Weinstein, C. E.	2010	Journal of Experimental Education, 78, 487-512. doi:10.1080/00220970903352753
Article	Foundations for Teaching: A Philosophy for MCU	Anderson, P.	1999	MC Gazette, Volume 83, Issue 4
Article	Left Brain/Right Brain: Pathways to Reach Every Learner	Connell		http://www.scholastic.com/teachers/article/left-brainright-brain
Article	No "Approved Solutions" in Asymmetric Warfare	Foster, C.	From: Assembly July/August 2009	http://globalguerrillas.typepad.com/files/assembly-article.pdf
Article	Physicists Seek to Lose the Lecture	Hanford		http://www.npr.org/2012/01/01/144550920/physicists-seek-to-lose-the-lecture-as-teaching-tool
Article	Strategies of Decision Making	Klein, Gary		http://www.dtic.mil/dtic/tr/fulltext/u2/a226146.pdf
Article	Teaching Learners to be Self-Directed	Grow, Gerald O.	Adult Education Quarterly, 41(3), 125-149.	http://thinkteaching.pbworks.com/f/Grow01.pdf
Article	The 4Mat system: Teaching to learning styles with right/left mode techniques. Barrington, IL: Excel Inc	McCarthy, B.	1987	http://harvardmagazine.com/2012/03/twilight-of-the-lecture
Article	The Power of Feedback	Hattie, J. Timperley, H.	From Review of Educational Research, March 2007	http://education.qld.gov.au/staff/development/performance/resources/readings/power-feedback.pdf
Article	The Strategic Corporal: Leadership in the Three-Block War	Krulak, C.C.	January, 1999	Marine Corps Gazette, 83(1), 18-23
Article	Twilight of the Lecture	Lambert, C.		http://harvardmagazine.com/2012/03/twilight-of-the-lecture
Article	What Not to Do in Teaching Cases	Herreid, C.F.	Journal of College Science Teaching, Vol. 30, No. 5, Feb 2001	http://sciencecases.lib.buffalo.edu/cs/pdfs/Dont-XXX-5.pdf

Adult Learning Resources (Page 3)				
TYPE	**TITLE**	**AUTHOR**	**ISBN**	**WEBSITE (IF AVAIL)**
Book	A categorized list of motivation definitions, with suggestions for a consensual definition	Kleinginna and Kleinginna	0146-7239	Motivation and Emotion, 5, 263-291
Book	Active Training: A Handbook of Techniques, Designs, Case Examples and Tips	Silberman, M.	0-7879-7623-7	
Book	Adult learning theory: It matters. In *Teaching management: A field guide for professors, consultants, and corporate trainers,* Chapter 3	Clawson, J. G., Haskins, M. E.	2006	http://faculty.darden.virginia.edu/clawsonj/COURSES/DOC_SEM_PEDAGOGY/11-27-05%20CH%2003%20Adult%20Learning-3c.pdf
Book	Coaching with the Brain in Mind: Foundations for Practice	Rock, David & Page, Linda	9780470405680	
Book	Cognitive and ethical growth: the making of meaning	Penny, W.G. Jr.	1981	http://ed-share.educ.msu.edu/scan/ead/renn/perry.pdf
Book	Educational Psychology 4th ed: Developing Learners, Part 2	Ormrod, J.	ISBN 10: 0130887048 ISBN 13: 9780130887047	Ch. 11, pp. 368-369
Book	Effective Strategies for Teaching Adults	Seaman, D.F. and Fellenz, R.A.	0-675-20632-4	
Book	Engaging Imagination: Helping Students Become Creative and Reflective Thinkers	Brookfield, Stephen D. & James, Alison	978-1-118-40947-3	
Book	Essentials of Educational Psychology: Big Ideas to Guide Effective Teaching	Ormrod, J.E.	978-0-13-136727-2	
Book	Experience and Education	Dewey, J.	0-684-83828-1	
Book	Experiential Learning: A Best Practice Handbook for Educators and Trainers	Beard, C., Wilson, J.P.	978-0-7494-4489-1	
Book	Experiential Learning: Experience as the Source of Learning and Development	Kolb, D.A.	0-13-295261-0	
Book	From Brian to Mind: Using Neuroscience to Guide Change in Education	Zull, J.E.	978-1-579-22-461-5	
Book	Forms of Intellectual and Ethical Development in the College Years: A Scheme	Perry, William G., Jr.	0787941182	Reprinted November 1998; Jossey-Bass

Adult Learning Resources (Page 4)				
TYPE	**TITLE**	**AUTHOR**	**ISBN**	**WEBSITE (IF AVAIL)**
Book	How Learning Works: Seven Research-Based Principles for Smart Teaching	Ambrose, S.A., Bridges, M.W., DiPietro, M., Lovett, M.C., Norman, M.K.	978-0-470-48410-4	
Book	How People Learn: Brain, Mind, Experience, and School	National Research Council	0-309-07036-8	
Book	How The Brain Learns	Sousa, D.A.	978-1412997973	
Book	Instruction and Technology: Designs for Everyday Learning	Mehlenbacher, B.	978-0-262-01394-9	
Book	Learning Style Inventory: Self-Scoring Inventory and Interpretation Booklet	Kolb, D.A.	1981	http://linksprogram.gmu.edu/tutorcorner/NCLC495Readings/Kolb_Inventory.pdf
Book	Making Sense of Adult Learning	Mackeracher, D.	0-8020-3778-X	
Book	Mastering the Techniques of Teaching	Lowman, J.	0-7879-5568-X	
Book	Mckeachie's teaching tips: Strategies, research, and theory for college and university teachers, fourteenth edition	McKeachie, W. J., Svinicki, M. D.	978-113396794	Belmont, CA: Wadsworth
Book	Motivation and Personality	Maslow, A.	978-0060419875	www.maslow.com
Book	Planning Programs for Adult Learners	Caffarella, R.S., Daffron, S.R., Cervero, R.M.	978-0470770375	
Book	Powerful Techniques for Teaching Adults	Brookfield, Stephen D.	978-1-118-0-1700-5	
Book	Rethinking Teaching in Higher Education: From a Course Design Workshop to a Faculty Development Framework	Saroyan, Alenoush & Amundsen, Cheryl	978-1579220471	
Book	Self-efficacy: The exercise of control	Bandura, Albert	978-0716728504	
Book	Sources of Power: How People Make Decisions	Klein, Gary	978-0262611466	
Book	Teaching for Critical Thinking: Tools and Techniques to help Students Question their Assumptions	Brookfield, Stephen D.	978-0-470-88934-3	
Book	Teaching for Successful Intelligence	Sternburg, R.J. and Grigorenko, E.L.	978-1412955829	

Adult Learning Resources (Page 5)				
TYPE	**TITLE**	**AUTHOR**	**ISBN**	**WEBSITE (IF AVAIL)**
Book	Teaching for the Two Sided Mind	Williams, L.	9780671622398	
Book	Teaching Maneuver Warfare	Wyly, M.	978-0891415183	Part of Maneuver Warfare: An Anthology by Hooker
Book	The Art of Changing The Brain: Enriching the Practice of Teaching by Exploring the Biology of Learning	Zull, J.E.	1-57922-053-3	
Book	The Craft of Teaching: A Guide to Mastering the Professor's Art	Eble, K.E.	978-1555426644	
Book	The modern practice of adult education: From pedagogy to andragogy	Knowles, M. S.	978-0842822138	New York: Cambridge Adult Education
Book	The Reflective Practitioner: How Professionals Think in Action	Schon, D. A.	0-465-06878-2	
Book	The Thinking Classroom: Learning and Teaching in a Culture of Thinking	Tishman, Perkins and Jay	0-205-16508-7	
Book	Thinking About Teaching and Learning: Developing Habits of Learning with First Year College and University Students	Leamnson, R.	1-57922-012-6	
Book	Transformative learning in Practice: Insights from community, Workplace, and Higher Education	Mezirow, J.	978-0470257906	
Book	The Modern American College	Chickering and Associates		(San Francisco: Jossey-Bass): 76-116.
Book	What the Best College Teachers Do	Bain, K.	0-674-01325-5	
Book	What form transforms? *Learning as Transformation: Critical Perspectives on Theory in Progress*	Kegan, R.	978-0787948450	J. Mezirow & Associates (Ed.), Learning as transformation (pp. 35-70)
Paper	The ABCs of Case Teaching	Golich, V.L., Boyer, M., Franko, P., Lamy, S.	From: Pew Case Studies in International Affairs	http://cet.usc.edu/resources/teaching_learning/docs/abcs.pdf
Product	Keirsey Temperament Sorter	Keirsey		www.keirsey.com

Adult Learning Resources (Page 6)				
TYPE	**TITLE**	**AUTHOR**	**ISBN**	**WEBSITE (IF AVAIL)**
Web	4MATion	McCarthy, B.		www.4mat4learning.com.au
Web	Active Learning		Active learning strategies	www.cte.cornell.edu/teaching-ideas/engaging-students/active-learning.html
Web	Compilation for Faculty Members. Handbook of Critical Thinking Resources.			http://academic.pg.cc.md.us/~wpeirce/MCCCTR/handbook.pdf
Web	David kolb: Learning styles	Cooper, S.	2009	http://lifecircles-inc.com/Learning theories/constructivism/kolb.html
Web	Education vs. training: A military perspective.	Kime, S. F., Anderson, C. L.	1997	http://files.eric.ed.gov/fulltext/ED404452.pdf
Web	Introduction to Kolb learning style inventory	Kolb, D.A.	LSI Presentation and Analysis website	http://lsibba310.weebly.com/index.html
Web	Kolb - Learning Styles	McLeod, S. A.	2010	http://www.simplypsychology.org/learning-kolb.html
Web	National Center for the Study of Adult Learning and Literacy		Resources on training, adult learning, and literacy	www.ncsall.net
Web	Teaching Learners to be Self-Directed	Grow, Gerald O.	1996	Adult Education Quarterly, 41 (3), 125-149. Retrieved from: http://www.longleaf.net/ggrow.
Web	Teaching and Learning Resources		Instructional Design and Faculty Development	www.teachinglearningresources.pbworks.com/w/page/49710646/Instructional%20Design
Web	The National Academies Press		Download textbooks free	www.nap.edu
Web	Theories of Learning in Educational Psychology		Development of learning and instruction	www.lifecircles-inc.com/Learningtheories/learningmap.html
Web	Theory Into Practice Database		Development of learning and instruction	www.instructionaldesign.org
Web	Transformative Learning Theory		Transformative Learning Theory	www.transformativelearningtheory.com/corePrinciples.html

Figure E-1.--Adult Learning Resources

APPENDIX F

ADVANTAGES AND LIMITATIONS OF INSTRUCTIONAL METHODS

INSTRUCTIONAL METHODS	ADVANTAGES	LIMITATIONS
Guided Discussion (Small Group, Peer Teaching, Free 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.
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.
Lecture (Formal, Informal, Briefing, Guest Lecture). 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)

INSTRUCTIONAL METHODS	ADVANTAGES	LIMITATIONS
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.
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.
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.

INSTRUCTIONAL METHODS	ADVANTAGES	LIMITATIONS
Reading Assignments (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. (Used as a supplement with formal Marine Corps curricula. In cases of entry-level should be used sparingly.)
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.
Offsite (Field Trips). Offsites are extensions of classroom instruction and provide worthwhile learning opportunities for students to participate in unique and enriching educational experiences. 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
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 instant 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. ☑ 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.
Simulations (Live, Virtual, Constructive). 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.

Figure F-1.--Advantages and Limitations of Instructional Methods

APPENDIX G

ADVANTAGES AND LIMITATIONS OF INSTRUCTIONAL MEDIA

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 G-1.-- Advantages and Limitations of Instructional Media

APPENDIX H

SECTION I – STANDARD VERB USAGE

SECTION I

STANDARD VERB USAGE

PURPOSE: The use of standard, well-defined verbs provides clarity, prevents duplicate work, and aids in providing quality training. The verbs in Section I are the approved verbs for task titles. They also provide a partial source of verbs for learning objectives and task performance steps.

DESCRIPTION:

- **Promote Clarity:**
  - Allows T&R task/review boards, task analysts, trainers, and Marines to understand what the task statement means. This is particularly important since:
    - The person who analyzes the task may not be the person who developed the task statement.
    - Task selection boards usually make their decisions based on the task statement, before the conditions and standards are fully developed.
- **Prevent Duplication:**
  - It is possible to write the same task many different ways, some so differently that it is almost impossible to tell if it is the same task. If you use standard verbs, it is easier to group tasks by verb and see if you have duplicated behaviors.
- **Promote application of Sound Training Principles:**
  - There are many words which may appear to be action verbs, but which don't actually refer to an observable action (such as 'know', 'understand,' 'appreciate,' and so on.) By using standard verbs, you will avoid these words and produce sound, observable tasks.

- ***Note***: Those verbs marked with an asterisk (*) should be used with caution. For a fuller explanation, see Section II, VERBS TO BE USED WITH CAUTION.

WORD	USAGE
***Achieve**	To attain a desired end.
Adjust	1. To correct the actions of a distant unit. *Example: Adjust indirect fire.* 2. To bring parts of instruments into a truer or more effective relative position or setting.
***Administer**	To manage or supervise the execution, use, or conduct of a relatively structured
Advise	To counsel or recommend.
Alert	To make aware of.
Align	To place parts in the proper position to one another.
Allocate	To apportion for a specific purpose or to particular persons or things.
Ambush	1. To attack (by surprise) a moving force with a stationary force. 2. To conduct a surprise attack on another aircraft. *Example: Ambush hostile aircraft.*
***Analyze**	To separate a whole into its constituents with a view to its examination and interpretation.
Annotate	To make or furnish critical or explanatory notes or comments.

***Apply**	1. To put on. *Example: Apply a base coat of paint.* 2. To use practically. 3. To concentrate.
Approve	To give formal or official sanction.
Assault	To carry out the close combat phase of an attack.
Assemble	1. To fit the parts of an item together. *Note: Usually said of a machine.* 2. To bring together. *Note: Usually said of an organization or group.*
***Assess**	1. To determine the importance, size, or value of. 2. To fix the amount of.
Assign	1. To give responsibility. *Note: For the execution of a task.* 2. To place under the control of. *Example: Assign Marines to EMI.*
Assist	To give aid by participating in a task.
Attack	An offensive action characterized by movement supported by fire with the objective of defeating or destroying the enemy. *Example: Attack under conditions of limited visibility.*
Authenticate	1. To verify identity in response to a challenge. *Note: See Challenge.* 2. To verify the authenticity of.
Block	1. A tactical mission task that denies the enemy access to an area or prevents his in a direction or along an avenue of approach.
Block	2. An obstacle effect that integrates fire planning and obstacle effort to stop an attacker along a specific avenue of approach or to prevent him from passing through engagement area.
Breach	1. The employment of any means available to break through or secure a passage through an obstacle. *Note: As an enemy position.* 2. To secure passage through. *Note: Usually said of an obstacle.*
Brief	To give information or final precise instructions.
Bypass	A tactical mission task in which the commander directs his unit to maneuver around an obstacle, avoiding combat with an enemy force.
Calculate	To ascertain by computation.
Camouflage	Concealing of personnel, equipment, and facilities.
Canalize	To restrict operations to a narrow zone by use of existing or reinforcing obstacles or by fire or bombing.
Challenge	To order to prove identity.
Change	To make different in some particular.
***Check**	To inspect for satisfactory condition, accuracy, safety, or performance.
Clear	1. The total elimination or neutralization of an obstacle that is usually performed by follow-on engineers and is not done under fire. *Example: Clear a trenchline. Clear a building.* 2. To approve or authorize, or obtain approval or authorization for: a. a person or persons with regard to their actions, movements, duties, etc.; b. an object or group of objects, as equipment or supplies, with regard to quality, quantity, purpose, movement, disposition, etc. c. a request, with regard to correctness of form, validity, etc.

	3. To give a person a security clearance. 4. To give one or more aircraft a clearance. 5. To fly over an obstacle without touching it. 6. To clear the air to gain either temporary or permanent air superiority or control in given sector. 7. To operate a weapon / gun so as to unload it or make certain no ammunition remains. *Example: Clear a M16 rifle.* 8. To free a gun of stoppages. *Example: Clear a stoppage in a M240 machinegun.* 9. To clear an engine; to open the throttle of an idling engine to free it from carbon. 10. A tactical mission task that requires the commander to remove all enemy forces and eliminate organized resistance in an assigned area. 11. To pass a designated point, line, or object. *Example: The end of a column passes the terrain feature before the latter is*
Close	1. To move into combat range of an enemy force. *Example: Close with, locate and destroy the enemy.* 2. To arrive at a designated position. 3. To move in such a manner as to present passage through.
Collate	To bring parts together to form a whole. *Note: Usually said of information or intelligence.*
Collect	1. To gather or exact from a number of persons or sources. *Note: Usually said of information.* 2. To bring together in a group.
Combine	To join two or more things such as units, or chemical substances into one.
Communicate	To convey knowledge of or information about; to make known.
***Compare**	To examine the character or qualities of, especially in order to discover resemblances or differences. *Example: Compare courses of action.*
Complete	To bring to an end and especially into a perfected state.
Comply	To act in accordance with orders, regulations, policy, etc.
Compute	To determine, especially by mathematical means.
***Conduct**	To direct or control, lead, or guide.
Confirm	To validate.
Connect	1. To join. 2. To fasten together.
Consolidate	1. To organize or reorganize, bringing separate parts together into one whole. 2. To secure or complete an action. *Example: Consolidate on the objective.*
Construct	To build.
Contain	To stop, hold, or surround the forces of the enemy or to cause the enemy to center
Control	1. Authority that may be less than full command exercised by a commander over part of activities of subordinate or other organizations. 2. Physical or psychological pressures exerted with the intent to assure that an agent group will respond as directed. 3. A tactical mission task that requires the commander to maintain physical influence a specified area to prevent its use by an enemy. 4. Action taken that eliminates a hazard or reduces the risk from that hazard. Part of third step in risk management. 5. Within command and control, the regulation of forces and other battlefield operating systems to accomplish the mission in accordance with the commander's intent.

Coordinate	To bring into a common action, movement, or condition.
Correct	To alter or adjust so as to bring to some standard or required condition.
Correlate	To present or set forth so as to show relationship.
***Counsel**	Advise or provide guidance.
Counter	To act in opposition to; nullify.
Cover	To afford protection or security to.
Cross	To pass over or through.
Cross-check	To check from various angles or sources to determine validity or accuracy.
Debrief	To obtain an oral report on an action or mission immediately afterwards. *Example: Debrief a reconnaissance patrol.*
Decontaminate	To cleanse or remove chemical or radiological contamination.
Defeat	1. A tactical mission task that occurs when an enemy force has temporarily or lost the physical means or the will to fight. The defeated force's commander is unwilling or unable to pursue his adopted course of action, thereby yielding to the commander's will, and can no longer interfere to a significant degree with the of friendly. 2. Defeat can result from the use of force or the threat of its use
Defend	To ward off an actual or threatened action.
***Define**	1. To determine the limits and nature. 2. To state the meaning of.
Delay	To slow the advance of an enemy force without becoming decisively engaged.
Deliver	To send to an intended target or destination.
***Demonstrate**	1. To feign an action for the purposes of deceiving an enemy. 2. To show by reasoning. 3. To show the operation or working of. 4. To explain by using examples, experiments, or action.
Deploy	1. To spread out, utilize, or arrange, especially tactically. 2. To position for use.
Designate	1. To indicate and set apart for a specific purpose, office, or duty. 2. To select. *Note: Usually said of a target.*
Destroy	1. A tactical mission task that physically renders an enemy force combat-ineffective it is reconstituted. *Example: Destroy attacking force.* 2. To damage a combat system so badly that it cannot perform any function or be restored to a usable condition without being entirely rebuilt. Example: Destroy enemy vehicles.
Detect	To discover.
Determine	1. To settle or decide by choice of alternatives or possibilities. 2. To fix precisely.
Develop	To set forth or make clear by degrees or in detail.
Direct	1. To regulate the activities or course by acting through subordinate leaders. 2. To control through suggestions and guidelines.
Disassemble	To take apart, usually for the purposes of cleaning or repair.
Disconnect	To sever the connection between.
Disengage	1. To release or break contact with. *Example: Disengage the drive shaft.* 2. A tactical mission task where a commander has his unit break contact with the enemy allow the conduct of another mission or to avoid decisive engagement. *Example: Disengage from enemy force.*

Dismantle	To render inoperable by taking apart. *Note: See Disassemble.*
Dispatch	To send away with promptness or speed, especially on official business.
Displace	To leave one position and occupy another.
Disrupt	1. A tactical mission task in which a commander integrates direct and indirect fires, terrain, and obstacles to upset an enemy's formation or tempo, interrupt his or cause his forces to commit prematurely or attack in piecemeal fashion. 2. An engineer obstacle effect that focuses fire planning and obstacle effort to cause enemy to break up his formation and tempo, interrupt his timetable, commit breaching assets prematurely, and attack in a piecemeal effort. 3. In information operations, breaking and interrupting the flow of information between selected command and control nodes.
Disseminate	To disperse throughout. *Note: Usually refers to orders, information, and similar matters.*
Distribute	To give out or deliver, especially to members of a group.
Draft	To draw the preliminary sketch, version, or plan of.
***Effect**	To cause the desired result or outcome. *Note: See Achieve.*
Emplace	To put in a prepared position. *Example: Emplace the howitzer.*
Employ	To make use of, usually in the role of a leader or commander.
Encrypt	Encipher, encode.
Enforce	To see that the provisions (of an order or regulation) are carried out effectively.
Engage	1. To intermesh or interlock. *Note: Usually refers to machinery.* 2. To fight.
***Ensure**	To make certain. To guarantee.
Enter	To come in.
Erect	To build or set up. *Example: Erect OE-254 Antenna.*
Establish	1. To bring into existence. 2. To introduce as a permanent entity or procedure.
Evacuate	To move from an area, usually for the purpose of treatment, repair, or prevention of capture.
Evade	To avoid.
***Evaluate**	To determine the significance or worth of, usually by careful appraisal and study.
Exchange	To part with for a substitute.
Exfiltrate	The removal of personnel or units from areas under enemy control by stealth, deception, surprise, or clandestine means.
Extend	1. To increase the scope, meaning, or application of. 2. To elongate or to increase the size. *Example: Extend the legs of the tripod.*
Extract	1. To remove from an area, usually for combat purposes. *Example: Extract a fire team under fire.* 2. To select and copy out or cite.
Finalize	To put in final or finished form: to give final approval to. *Example: Finalize operations order.*
Fire	To discharge a weapon.
Fix	To prevent the enemy from moving away from a specific location for a specific time.

Follow and assume	To follow a lead force and assume the mission if the lead force is fixed or attrited.
Follow and support	To follow the lead force and support its offensive operations.
Format	To produce a document or electronic report in a specified form or style.
Formulate	To put into a systematized statement or expression.
Forward	To send onward.
Fuel	To provide with fuel.
Ground	To connect electrically with a ground.
Guard	1. To protect by physical security means. 2. To prevent from escaping by physical security means. 3. To protect by accepting combat. *Example: Guard a flank.*
Harden	To protect passively by providing or increasing resistance to projectiles and similar threats.
Hover	To hold a flying aircraft relatively motionless.
***Identify**	1. To determine critical or necessary conditions or other factors. *Example: Identify all specified and implied missions.* 2. To determine the specific model of an item. *Example: Identify threat armored vehicles.* 3. To ascertain the origin, nature, or definitive characteristics of.
Implement	To give practical effect to and ensure of actual fulfillment by concrete measures.
Interdict	A tactical mission task where the commander prevents, disrupts, or delays the enemy's use of an area or route.
Infiltrate	To move by small groups, usually clandestinely.
Inform	To make known.
Input	To provide information to or to enter information into a system.
***Inspect**	To examine officially.
Install	To put in an indicated place, condition, or status.
Integrate	To form, coordinate, or blend into a functioning or unified whole.
Interpret	To present or delineate the meaning of. *Example: Interpreting for Afghan and English speakers.*
Issue	To give out. *Example: Issue the operations order.*
Isolate	A tactical mission task that requires a unit to seal off - both physically and psychologically - an enemy from his sources of support, deny an enemy freedom of movement, and prevent an enemy unit from having contact with other enemy forces.
Land	To bring an aircraft to earth.
Launch	1. To send an aircraft or missile into the air. *Note: See take off.* *Note: Launch usually refers to unmanned vehicles; however, launch may also mean a collective act of sending a manned aircraft aloft.* *Example: Launch an aircraft from the flight deck.* 2. To send boats and landing craft from a larger Naval vessel Example: Launch small boats from the well deck.
Lay	To point a weapon in a precise direction. *Example: Lay the 60mm Mortar.*
Lead	1. To go at the head. *Example: Lead a convoy.* 2. To exercise direct, low-level control. *Example: Lead a fire team to the assault position.*

Level	1. To make even or uniform. 2. To apportion equally.
Load	1. To insert ammunition into a weapon or launcher. 2. To place in or on a means of conveyance.
Locate	To determine or set the position of.
Log	To enter details of or about an event in a log.
Maintain	To preserve, fix, or keep in good repair.
Make	To create or cause to happen.
***Manage**	1. To handle or direct with a degree of skill or specialized knowledge. 2. To exercise executive, administrative, and supervisory direction.
Modify	To make minor changes in/to.
***Monitor**	To watch, observe, or check, especially for a special purpose. *Example: Monitor enemy radio traffic.*
Motivate	To provide with an incentive.
Move	To proceed from one point to another.
***Name**	1. To designate or mention by name. 2. To appoint. 3. To identify by giving the right name. 4. To give a name.
Navigate	Determine and follow a course.
Neutralize	1. To render ineffective or unusable 2. To render enemy personnel or material incapable of interfering with operations 3. To render safe mines, bombs, missiles or IEDs. 4. To make harmless anything contaminated with a chemical agent.
Notify	To inform, to warn, to make known, or to make notice of.
Observe	To watch carefully.
Obtain	To gain or attain. *Note: Usually by planned action or effort.*
Occupy	A tactical mission task that involves a force moving into an area so that it can control the entire area. Both the force's movement to and occupation of the area occur without enemy opposition. *Example: Occupy a Forward Operating Base (FOB).*
Open	1. To make ready for use. *Example: Open a Forward Area Rearming and Refueling Point (FARP).* 2. To make available for entry or passage.
Operate	1. To cause a piece of equipment to function. 2. To perform a function.
***Orchestrate**	1. To compose/arrange music. 2. To organize, manage, or arrange.
Order	To command a specific action to be executed.
Organize	To arrange by systematic planning and united support.
Orient	To point or look in a specific direction. *Example: Orient weapons on assigned sector.*
***Oversee**	To watch over and direct.
Pack	To place in a container for transportation or storage.
Patrol	To conduct security or offensive operations with small, specially tailored groups. *Example: Patrol the gaps between units.*
***Perform**	To carry out an action or pattern of behavior.
Place	Put in proper position or location. *Note: "Position" or "locate" are usually better choices.*

Plan	1. To devise or project. 2. To formulate a systematic scheme or program of action.
Plot	To mark or note on a map, chart, or graph.
Police	1. To provide protective or police services. 2. To make clean and put in order.
Position	To put in place; to set.
Post	1. To make transfer entries. 2. To position at a certain site. *Example: Post the guard.*
Predict	Foretell on the basis of observation, experience, or scientific reason.
Prepare	1. To put together. *Example: Prepare launcher for firing.* 2. To combine elements and produce a product. *Example: Prepare a meal.* 3. To make ready. *Example: Prepare to continue the attack.* 4. To make other persons or things ready. *Example: Prepare a fighting position.*
Prevent	To keep from occurring or recurring. *Example: Prevent cold weather injuries.*
***Prioritize**	To put in order or rank. *Note: Especially for the purpose of allocating resources.*
Process	To initiate a series of actions or operations leading to a particular end. *Example: Process a leave request.*
Produce	To develop or create.
Project	To plan, calculate, or estimate for the future. *Example: Project ammunition expenditures.*
Protect	To shield from destruction; safeguard.
Provide	To supply or make available.
Publish	To produce for distribution. *Example: Publish the duty roster.*
Range	To determine the distance. *Note: Usually to a target.*
Reach	To arrive at a location.
React	To respond, usually to an emergency situation with a limited choice of actions. *Example: React to Engine Failure in Flight.*
Read	To examine carefully so as to understand.
Realign	To reorganize or make new groupings.
Reassess	To re-determine the extent or value.
Recall	To bring back (forces) to another location.
Receive	To acquire from someone else. *Example: Receive Patients.*
***Recognize**	To determine the category of an item. *Learning Objective Example: Recognize Threat Armor Vehicles.*
Recommend	To endorse as worthy, fit, competent, exceptional, etc.
Reconnoiter	To obtain information by visual observation or other methods. *Note: Reconnoiter usually implies a physical movement to the area to be observed.*
Record	1. To set down as a means of preserving information. 2. To document. 3. To mechanically or electronically save information.

Recover	To extract damaged or disabled equipment and move to a location for repair.
Redistribute	To reallocate, usually in response to uneven consumption or usage. *Example: Redistribute ammunition.*
Reduce	1. To diminish in size, amount, extent, or number. 2. A tactical mission task that involves the destruction of an encircled or bypassed force. 3. One of the five breaching fundamentals. The creation of a lane through, over, or an obstacle. To render ineffective by partially dismantling. *Example: Reduce an obstacle.* 4. To render operable by following a prescribed procedure to eliminate a malfunction. *Example: Reduce a stoppage in a M249 Squad Automatic Weapon.*
Reestablish	To establish again, usually in response to a combat loss or damage. *Example: Reestablish communications.*
Reexamine	To examine again.
Release	1. To let go. 2. To set free from configuration or condition.
Relieve	1. To replace. *Example: Relieve a Company in place.* 2. To reduce or eliminate pressure on. *Example: Relieve an encircled unit.*
Relocate	Establish or lay out in a new place.
Remove	1. To take away or displace. 2. To dismiss. 3. To eliminate, kill, or destroy.
Reorganize	To organize again, usually as a result of combat damage or loss.
Repair	To restore to serviceable condition.
Replace	To substitute a new or workable item or person.
Replenish	To fill again.
Report	1. To present an account officially. 2. To formally or regularly carry back and repeat to another. 3. To provide information on ongoing activities. *Example: Report initial enemy contact.*
Request	1. To ask for. 2. To ask someone to do something.
Resolve	To reduce by analysis.
Restate	To state again or in another way.
Resume	To begin again.
Retain	1. A tactical task to occupy and hold a terrain feature to ensure that it is free of occupation or use. 2. A tactical mission task in which the commander ensures that a terrain feature already controlled by a friendly force remains free of enemy occupation or use.
Return	To restore to a former or proper place.
***Review**	To go over for the purpose of determining correctness or currency.
Revise	To correct or improve. *Note: Usually applied to a plan or document.*
Rotate	To cause to turn about an axis or center.
Schedule	To appoint, assign, or designate for a fixed time.
Secure	1. In an operational context, to gain possession of a position or terrain feature with without force, and to make such disposition as will prevent, as far as possible, its destruction or loss by enemy action.

	2. A tactical mission task that involves preventing a unit, facility, or geographical location from being damaged or destroyed as a result of enemy action. 3. One of the five breaching fundamentals. Those actions which eliminate the enemy's to interfere with the reduction and passage of combat power through a lane. Secure accomplished by maneuver or by fires. 4. To make immobile, make safe or to fix tightly.
Seize	1. To clear a designated area and obtain control of it. 2. To employ combat forces to occupy physically and control a designated area. 3. A tactical mission task that involves taking possession of a designated area using overwhelming force.
Select	To choose from among others to meet specific standards or criteria.
Send	To dispatch.
Set	To adjust a device to a desired position, to make ready for future action.
Set up	To erect or position components.
Sort	To examine and place into categories.
Splint	To support or restrict.
Stand to	To increase security by coming to full alertness, with all weapons manned and ready. *Note: Derived from the phrase "Stand to Arms."*
State	To declare or set forth; a condition. *Example: Suppress Enemy Air Defenses (SEAD).*
Stockpile	To accumulate supplies for use. *Example: Stockpile ammunition on a battle position.*
Store	To stock or deposit. *Note: Store implies protecting from deterioration or pilferage.*
Strike	1. To attack. 2. To disassemble. *Example: Strike a tent.*
Submit	To send forward for approval.
Supervise	1. To oversee. 2. To critically watch, motivate and direct the activities of subordinates.
Support	1. The action of a force that aids, protects, complements, or sustains another force in accordance with a directive requiring such action. 2. A unit which helps another unit in battle. 3. An element of a command which assists, protects, or supplies other forces in combat 4. To aid or help. *Note: Usually refers to collective tasks.* *Example: Support by fire.*
Suppress	1. A tactical mission task that results in temporary degradation of the performance of a force or weapons system below the level needed to accomplish the mission. 2. To actively prevent, usually by firing on. 3. One of the five breaching fundamentals. The focus of all fires on enemy personnel, weapons, or equipment to prevent effective fires on friendly forces. The purpose of suppression is to protect forces reducing and maneuvering through the obstacle and to soften initial foothold.
Sweep	To move through and search an area.
Take charge	To assume control or command.
Take off	To send an aircraft into the air. *Note: Usually said of a manned aircraft.* *Note: See Launch.*

Task	To assign responsibility.
Template	To estimate or predict enemy dispositions or actions by applying known enemy doctrine.
Test	To examine to prove the value or ascertain the nature of something.
Track	1. To keep a moving target within the sight reticule. *Example: Track a target with an Anti-armor Weapon.* 2. To follow by means of marks or scent.
Train	To make proficient by instruction and practice.
Translate	To express in more comprehensible term, or in a different language.
Transmit	To send over a communications net.
Transport	To carry from one place to another; convey.
Treat	To care for medically.
Triage	To assess patients' physical condition to determine treatment priority.
Troubleshoot	To locate the source of trouble in equipment, systems, or operations.
Tune	To put on the proper setting or frequency. *Note: As a radio.*
Turn	1. A tactical mission task that involves forcing an enemy force from one avenue of or movement corridor to another. 2. A tactical obstacle effect that integrates fire planning and obstacle effort to drive enemy formation from one avenue of approach to an adjacent avenue of approach or into engagement area. 3. To change the direction or orientation of something.
Update	To bring up to date or make current.
Validate	To substantiate accuracy by comparison or investigation.
Verify	To confirm or establish the accuracy or truth of something.
Wargame	To conduct comparisons of options using rules, data and procedures. *Example: Wargame Courses of Action.*
Wear	To bear or have on the person; to carry on the person.
Zero	To set a sight to enable a firearm to shoot a target.

Figure H-1.--Section I – Standard Verb Usage

APPENDIX I

SECTION II – VERBS TO USE WITH CAUTION FOR T&R EVENTS & TLOS

SECTION II

VERBS TO USE WITH CAUTION FOR T&R EVENTS AND TLOS

PURPOSE: These verbs should be used with care. Some are only variants of the verb "Do" and don't convey any special meaning. Their overuse defeats the purpose of standardized verbs and results in vague, "fuzzy" task statements.

DESCRIPTION: Other verbs in this list are often used for procedural steps in the performance of the task. When selecting a verb for a task title:

- Choose a verb you think is appropriate.
- Give yourself the "why" test (i.e., ask "Why would a Marine perform this task?")
- Determine if the answer to the "why" test is truly "to perform the entire task as written" or "to perform a task step." Your answer will indicate:
  a. You selected the correct verb for the task title.
  b. You need to change the task verb.
  c. You really have a task step.

- ***Note***: Other verbs are most often used to define enabling objectives. For example, when teaching a student to repair an item of equipment, the instructor might require the student to LIST, NAME, or IDENTIFY the component parts of the item.

WORD	USAGE
Achieve	This verb implies you are going to measure the product (or quality), not the process. A common mistake is to use the verb "achieve" and then to use standards that represent steps in the task rather than the quality of the outcome.
Administer	The use of this verb should be restricted to fairly mechanical or structured activities or to medical activities. It is not a synonym for "Manage".
Analyze	One usually analyzes something in order to accomplish a real task.
Apply	The use of "Apply" often leads to unobservable or unmeasurable task statements. Improper Use Example: Apply the Principles of War.
Assess	Difficult to observe or measure. Usually the analyst will state what the individual has to do in order to assess something.
Check	Checking is usually done as part of supervision or verification.
Compare	The answer to the "why" test may indicate the "compare" statement is really a task step and not a task.
Conduct	The verb 'Conduct' should be used ONLY when a more precise verb does not exist or when *Example 1 of Proper Use: Conduct a Deliberate Attack.* *Example 1 of Improper Use: Attack Deliberately.* *Note: "Attack" is the proper verb in the above task statement --- that's what you're going to do --- but the construction is so clumsy that in this case it is preferable to use "Conduct".*

Counsel	This has the connotation of simply providing general information. The verbs "advise" and "recommend" are usually what is really meant and indicate "action."
Define	Use of this verb often indicates an enabling objective that would be used in a classroom setting, not the task itself. *Example Of Improper Use: Define the Purpose of a Front End Analysis.*
Demonstrate	Like "define", "demonstrate" is usually indicative of an enabling objective. *Example Of Improper Use: Demonstrate an understanding of Front End Analysis by defining the Purpose of a Front End Analysis.*
Describe	Usually indicates an enabling objective. Not an action verb.
Discuss	Usually indicates an enabling objective or a learning activity. Not an action verb.
Effect	Similar in meaning to "achieve" but more vague.
Ensure	Difficult to observe or measure. Usually the analyst would be better off stating what the individual or unit has to do in order to ensure something happens or doesn't happen.
Evaluate	Usually indicates a step or enabling objective.
Explain	Usually indicates an enabling objective. Not an action verb.
Identify	May indicate a step or enabling objective. *Example Of Improper Task Title: Identify the Parts of the M16 Rifle.*
Inspect	Usually indicates a step or enabling objective.
List	Usually indicates an enabling objective. Not an action verb.
Manage	Difficult to observe or measure. Usually the analyst would be better off stating what the individual has to do in order to manage something. Since management is a complex set of skills, a task that uses the verb "manage" should be closely examined. It will often be found to be so broad that it must be split into several more well-defined
Monitor	Usually indicates a step or enabling objective.
Name	Nearly always indicates an enabling objective.
Orchestrate	1. To compose/arrange music. 2. To organize, manage, or arrange.
Oversee	To watch over and direct.
Perform	"Perform", like "conduct", is simply another way of saying "do".
Prioritize	Usually indicates a step or enabling objective.
Recognize	"Recognize" may be very appropriate for a learning objective, but caution must be used if it is used in a task title as the resulting statement may really be a task step. *Example: "Recognize friendly aircraft" may be a step in the task "Report enemy aircraft."*
Review	Usually indicates a step or enabling objective.

Figure I-1.--Section II – Verbs to use with caution for T&R Events & TLOS

APPENDIX J

SECTION III – VERBS WITH SIMILAR DEFINITIONS

SECTION III VERBS WITH SIMILAR DEFINITIONS	
WORD	**USAGE**
Administer, Manage	"Administer" refers to relatively structured activities, while "manage" refers to broader activities requiring great depth of knowledge and experience. *Example: A clerk may administer the unit's publications. An executive or senior manages weapons procurement.*
Assist, Support	"Support" usually indicates a collective task, while "Assist" usually indicates an individual task. *Assist: An assistant participates in the action with the principal actor.* *Illustration: The loader assists the gunner.* *Support: Implies a different kind of activity than the primary activity.* *Illustration: The ACE supports the MEF.*
Decide, Determine	"Decide" refers to arriving at a conclusion and to pronounce that decision. "Determine" means to settle or decide by choice of alternatives or possibilities and to fix precisely.
Disassemble, Dismantle	"Disassemble" implies taking apart for the purpose of repairing or cleaning. "Dismantle" implies taking apart on a relatively long term basis to render inoperable.
Lead, Command	"Lead" implies to go ahead, or to control the activities of a small group. "Command" is a legal status, which includes not only direction, but also disciplinary authority.
Operate, Employ	"Operate" is to turn on, control, and turn off a piece of equipment. "Employ" is to ensure that the equipment is used to further the mission of the organization. *system.*
Recognize, Identify	"Recognize" implies a less stringent standard than "Identify". *Example: A Marine may recognize a threat vehicle by a characteristic that is common many different threat vehicles (for example, the boat-shaped nose on most Soviet-personnel carriers). In order to identify the vehicle, he would have to determine model (for example, a BMP-80).*

Figure J-1.--Section III – Verbs with similar definitions

APPENDIX K

SECTION IV – VERBS NOT TO BE USED

SECTION IV VERBS NOT TO BE USED	
WORD	**USAGE**
Appreciate	Not measurable or observable. Not an action verb.
Become aware of	Not measurable or observable. Not an action verb.
Be familiar with	Not measurable or observable. Not an action verb.
Believe	Not measurable or observable. Not an action verb.
Clarify	Usually indicates an enabling objective.
Consider	Rarely observable. Not an action verb.
Enjoy	Not measurable or observable. Not an action verb.
Know	Not measurable or observable. Not an action verb.
Relate	Usually indicates an enabling objective. Not an action verb.
Understand	Not measurable or observable. Not an action verb.

Figure K-1.--Section IV – Verbs not to be used

APPENDIX L

ACRONYMS

AIR - After Instruction Report

BARS - Behaviorally Anchored Rating Scale

BAT - Be Able To

CAC - Common Access Card

CBT - Computer Based Training

CCRB - Course Content Review Board

CDD - Course Descriptive Data

CG - Commanding General

CID - Course Identifier

CMD - Curriculum and Development Management Module

COA - Course of Action

CT - Cease Training

CTC - Cease Training Criteria

CTE - Collective Training Event

DEL - Delete

DOD - Department of Defense

DODIC - Department of Defense Identification Code

ECC - End of Course Critique

EDCOM - Education Command

ELO - Enabling Learning Objective

ELT - Entry Level Training

ERF - Examination Rating Form

FEA - Front-End Analysis

FSER - Formal School Evaluation Report

FSTS - Formal Schools Training Support

HHQ - Higher Headquarters

HRT - High Risk Training

ICW - Instructor Computation Worksheet

IMI - Interactive Multimedia Instruction

IRF - Instructional Rating Form

ISD - Instructional Systems Design

ITE - Individual Training Event

ITRO - Inter-Service Training Review Organization

JTO - Joint Training Objective

KHT - Know How To

KSA - Knowledge, Skills, and Attitudes

LAW - Learning Analysis Worksheet

LO - Learning Objective

LOW - Learning Objective Worksheet

LSI - Learning Style Inventory

MAGTF - Marine Air-Ground Task Force

MCCDC - Marine Corps Combat Development Command

MCCLL - Marine Corps Center for Lessons Learned

MCISD - Marine Corps Instructional Systems Design

MCTFS - Marine Corps Total Forces System

MCTIMS - Marine Corps Training Information Management System

MCU - Marine Corps University

MET - Mission Essential Task

METL - Mission Essential Task List

MLF - Master Lesson File

MOJT - Managed On the Job Training

MOS - Military Occupational Specialty

MTESD - MAGTF Training & Education Standards Division

OCCFLD - Occupational Field

PECL - Performance Evaluation Checklist

PME - Professional Military Education

POI - Program of Instruction

POM - Program Objective Memorandum

PP&O - Plans, Policies, and Operations

PPBE - Planning, Programming, Budgeting, and Execution

QMP - Questionmark Perception

RA - Risk Assessment

RAW - Risk Assessment Worksheet

RM - Risk Management

ROP - Record of Proceedings

SATE - Systems Approach to Training and Education

SJT - Situational Judgment Test

SME - Subject Matter Expert

SNCO - Staff Non-Commissioned Officer

SOP - Standing Operating Procedure

SSC - Service School Code

T&R - Training and Readiness

T3I - Train-the-Trainer Integration

TA - Task Analyst

TECOM - Training and Education Command

TFSMS - Total Force Structure Management System

TIP - Training Input Plan

TLO - Terminal Learning Objective

TPD - Target Population Description

TRNGCMD - Training Command

UTM - Unit Training Management

VBT/L - Values Based Training/Leadership

WIIFM - What’s In It For Me

APPENDIX M

GLOSSARY

Academic Faculty. Consists of military personnel and civilians who are directly involved in the design, development, instruction, assessment, revision, and adaptation of the POI or curricula to ensure its standards, quality, and relevance. Additionally, faculty members should be engaged in the research, service, community of practice, and professional development in their areas of competency.

Academic Time. Time required to transfer learning objective based instruction, outcome based instruction, evaluating performance, or conducting lesson purpose. The minimum amount of daily academic time is 7 hours.

Administrative Time. Time required in the POI to complete administrative tasks necessary for the smooth functioning of the course.

Advocate. The Deputy Commandant or Counsel for the Commandant assigned to represent the Marine Corps as well as identify and prioritize capabilities required for specific organizational and functional areas.

Affective Domain. A taxonomy for classifying objectives that deals with feelings, attitudes, values, and other indicators of emotionally-based behavior.

After Course Report (ACR). The ACR, much like the AIR, summarizes all the pertinent data from the consolidated IRFs, the ACR summarizes all pertinent data from the analysis and interpretation of the ECCs.

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 ECC data related to the specific lesson.

Aiding Conditions. Any information or resource that is available to the student and identified in the learning objective.

Andragogy. Literally means the art and science of teaching adults.

Assessment. See Direct Assessment and Indirect Assessment.

Attitudes. An acquired mental state that influences choices for personal action, such as preferences, avoidance, or commitment.

Attributes. The manifestation of competencies and traits required of all Marines to meet the challenges of the present and future operating environments.

Augmented support personnel. Not required to be certified instructors, but are directly or indirectly involved in the presentation or support of teaching. They are typically used as training aids and can be categorized as assistant instructors, demonstrators, role players, corpsmen (when applicable), etc.

Behavior. Outwardly observable actions by a person in an environment and are related to mental associations within the domains of learning - “what learners must do”.

Checklist. Checklists consist of carefully worded questions that the evaluator answers by his review of course materials or observation of course components (i.e. graduate or instructor performance, conduct of a class).

Cognitive Domain. A taxonomy for classifying objectives that deal with verbal knowledge and intellectual skills such as concept learning and procedural skills.

Competencies. A specific range of KSAs expected of an individual Marine and are acquired through the integration of training, education and experience. Competencies are not associated with a specific course, but rather an individual’s capacity to perform a job.

Computer-Based Training (CBT). An instructional methodology where students interact individually, presented through a variety of media, controlled and monitored by a computer.

Concept Card. Comprises the bulk of the POI and provides a snapshot of all lessons, examinations, and administrative events.

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.

Constructive (Training). Models and simulations that involve simulated people operating simulated systems (e.g., MAGTF Tactical Warfare Simulation). Real people make inputs to such simulations, but are not involved in determining the outcomes.

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). To collect, review and validate course content using data inputs from formative and summative evaluation data. The CCRB begins and ends the evaluation process for a given course. Information captured in the CCRB provides members of the T&R Working Group with a resource of data to use in the development of T&R events.

Course Descriptive Data (CDD). A report, which documents course description, resource requirements, and justification for the development or refinement of formal POI taught at Marine Corps Formal Schools.

Course Structure. The course structure is a detailed chronological document identifying the implementation plan for a course. The purpose of developing a 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. It provides an outline of how the lessons in the course will flow from start to finish. It is not a training schedule. However, the course structure provides a guideline for developing the training schedule. At a minimum, the course structure will contain lesson designators, lesson titles, methods and academic hours.

Cues. Used to assist the instructor in maintaining awareness throughout the conduct of the lesson (e.g. time, media, breaks).

Curricula. A course of study required for the completion of a given PME school or program. It is constructed by the appropriate school's faculty, dean, and director and is approved by the President of Marine Corps University.

Curriculum Developer. Assigned to a Formal School as the individual responsible for the design, development, and maintenance of curriculum.

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.

Distance learning (DL). Learning situation in which the instructor and/or students are separated by time, location, or both. Education or training courses are delivered to remote locations via synchronous or asynchronous means of instruction (e.g. MarineNet, Blackboard). DL does not preclude the use of the traditional classroom. The definition of "distance education" is usually meant to describe something, which is broader than and entails the definition of e-learning.

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).

Education. Education is the process by which knowledge is attained in order to develop the analytical skills and critical thinking capability to enable Marines to adapt quickly in any environment. It conveys the broad body of knowledge and develops the habits of mind that are essential to the military professional's expertise in the art and science of war. Education programs prepare leaders to think critically, apply military judgment, and make ethical decisions to solve complex problems in an environment of ambiguity and uncertainty.

E-learning. Broad definition of the field of using technology to deliver education and training programs. It is typically used to describe media such as DVD, CD-ROM, Internet, Intranet, or wireless learning.

Enabling Learning Objective (ELO). Describes the behavior for prerequisite knowledge and skills necessary for a student to perform the steps identified in the T&R event. Subordinate to the TLO.

End of Course Critique (ECC). Evaluation instrument completed by the student after a course so that the student can assess the overall course.

Environment Checklist. Evaluation instrument used to assess physical conditions and training conditions in the learning environment.

Evaluation. Evaluation is a continuous process that occurs at all echelons, during every phase of training and can be both formal and informal. Evaluations ensure that Marines and units are capable of conducting their combat mission. Evaluation results are used to reallocate resources, reprioritize the training plan, and plan for future training. See formative and summative evaluation.

Examination Rating Form (ERF). A reaction form completed by students upon completion of examination that provides feedback on the facilitation and content of the examination. For pilot courses or validation courses, Formal Schools may find it beneficial to issue ERFs to a larger cross-section of the TPD.

Far transfer. The application of learning to a more “remote” or different context (i.e. applying the understanding of how shifting gears on a bike applies to shifting gears in a car - same basic principles of gears meshing or gear ratios).

Formal Instruction. Training and education (consisting of formal courses of instruction) conducted by Marine Corps Formal Schools. It may also encompass other Formal Schools and detachments whose curriculum falls under MCCDC’s cognizance and/or review. Formal courses are identifiable by assigned course identification (CID).

Formal School. An institution that develops and/or presents programs of instruction or curricula approved by the appropriate General/Flag officer to meet a specified training and education requirement.

Formative Evaluation. Form of evaluation designed to collect data and information that is used to improve the activities and products of the MCISD/SATE process while monitoring student progress over time.

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.

High Risk Training (HRT). Basic or advanced individual or collective training essential for preparing Marines and units for combat that, despite the presence of and adherence to proper safety controls, exposes students and instructors to the risk of injury, illness, death, or permanent disability; or property damage, damage to national or service interests, or degradation to efficient use of assets.

Independent Relationships. Skills and knowledge in one learning objective are unrelated to those skills and knowledge in another learning objective.

Individual Training Event (ITE). The standards used to specify individual training proficiency requirements (tasks) that support unit mission performance. They include a task (behavior), condition, proficiency standards (often performance steps), and references. ITEs are generally derived from collective training standards. ITEs constitute the basis for

design, development, implementation, and evaluation of all individual training conducted in units and institutions.

Initial Training Setting. All learning occurs inside the Training and Education continuum either at a Formal School, in the Operating Forces, or via a Distance Learning product.

Instruction. The facilitation of information to enable learning. The process by which knowledge and skills are transferred to students. Instruction applies to both training and education.

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 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 learning environment.

Instructional Strategies. General plans that define instructional goals and ways to achieve them.

Instructional Tactics. Instructional tactics are the specific activities an instructor performs in order to achieve his/her instructional strategies.

Instructional Techniques (Methods). Instructional techniques are the "how to" in presenting instruction. The methodologies used in any learning situation are primarily dictated by the learning objectives/learning outcomes decided upon by the instructors and curriculum developers.

Instructor. Categorized as individuals assigned to a teaching billet or faculty position that facilitate learning as their primary duty. An instructor can be a Marine, civil servant, or other service member who teaches a designated course approved by the appropriate general/flag officer in the chain of command. Augmented support personnel used as training aids (e.g. role players, demonstrator cadre) for instruction are not categorized to be an instructor.

Instructor Evaluation Checklist (IEC). This particular checklist is a tool that can be used when evaluating instructors. It covers, but is not limited to the evaluation of platform techniques, thorough coverage of the lesson, questioning techniques, communication skills, employment of method/media, and instructor/student interaction.

Instructor Preparation Guide (IPG). 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. The IPG is a required element of the MLF.

Knowledge. Information required to develop the skills for effective accomplishment of the jobs, duties, and tasks.

Learning. A modification of behaviors or mental associations due to direct or indirect experience in the environment. Learning is known to take place in three broad areas or “domains.” These domains are cognitive (oriented on

knowledge), psychomotor (oriented on skills), and affective (oriented on attitudes).

Learning Analysis. A procedure to identify knowledge and skills related to a task 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 Environment. The physical conditions and surroundings in which a job is performed, or in which learning takes place, including tools, equipment, and job aids.

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 facilitation method to be used.

Learning Outcome. A learning outcome is a statement that specifies how learners will “be” as a result of the learning experience.

Learning Setting. All official learning occurs inside the Training and Education continuum either at a Formal School, in the Operating Forces, or via a Distance Learning (DL) product.

Lecture. The lecture method is a presentation of information, concepts, or principles. Its main purpose is to present a large amount of information in a short period of time.

Lesson Environment Checklist. This checklist reveals information about physical conditions and training conditions.

Lesson Plan. An approved plan for instruction that provides specific definitions and directions 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.

Lesson Purpose. Presents material that, while important, is not associated with learning objectives of a specific individual or collective training event and is not testable.

Live (Training). Real people operates real systems to include both live people operating real platforms or systems on a training range and battle staffs from joint, component or service tactical headquarters using real world C2 systems.

Marine Corps Instructional Systems Design/Systems Approach to Training and Education (MCISD/SATE). Designed to determine, define, effect, and measure learning necessary for individual or collective needs. Human competence gaps, learning audience, and available learning settings frame the

instructional problem set as inputs. The internal MCISD/SATE processes interact to generate outputs of the system designed to resolve competence gaps and provide continual feedback to upgrade the system. MCISD/SATE is a creative process that yields an instructional roadmap or training plan to produce the tangible and intangible human capabilities needed by the Marine Corps across grades, functional areas, occupational groups, occupational specialties, billets, and units.

Master Lesson File (MLF). A compilation of living documents that are kept in the school to provide everything needed to conduct a lesson.

Mastery Learning. Using a building block approach to helping learners master segments of a learning program through progressively more challenging contexts until the specific learning objective/outcome has been executed and evaluated.

Mental associations. Internal connections made in the brain as the result of experience in an environment - “what occurs in a learner’s brain that can’t be seen”.

Military Occupational Specialty (MOS). A four-digit code describing a group of related duties and job performance tasks that extends 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 Essential Tasks (MET). A MET is a collective task in which an organization must be proficient to accomplish an appropriate portion of its wartime mission(s). MET listings are the foundation for the T&R manual; all events in the T&R manual support a MET.

Mission Essential Task List (METL). Descriptive training document that provides units a clear, war fighting focused description of collective actions necessary to achieve wartime mission proficiency.

Near transfer. The ability to take a knowledge or skill, learned in one context, and apply it in a similar context (i.e. learning to drive a four speed manual in one type of vehicle and then driving a four speed manual in a different type of vehicle).

Non-academic Time. Time instructors are in contact with students as required by the CG TECOM directives, various Marine Corps Orders, and the POI.

Objectivity. A characteristic of evaluation which requires that measurement in an educational environment be correct and factual and free from instructor bias.

Observation. A form of evaluation conducted during a practical application, performance test, or on the job, where an evaluator, instructor, or supervisor can observe students’ performance.

Observation Checklist. Evaluation instrument used to provide quality control and review effectiveness of instruction through the review of the MLF 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).

Pedagogy. Literally means the art and science of teaching children.

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-Based Evaluation. Used to measures how well the student has mastered the psychomotor (physical) and cognitive (mental) skills required for task or job performance.

Performance Evaluation 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.

Pilot Course. A validation method used where instructional materials in final form are presented to a target population group.

Post-Graduate Supervisor Survey. Evaluation instrument to collect data from the supervisors of graduates regarding a course previously attended.

Post-Graduate Survey. Evaluation instrument to collect data from the graduates regarding a course previously attended.

Practical Application. A technique used during an instructional session that permits students to acquire and practice the mental and physical skills necessary to successfully perform one or more learning objectives.

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.

Professional Military Education (PME). PME conveys the broad body of knowledge and develops the habits of mind that are essential to the military professional’s expertise in the art and science of war.

Program of Instruction (POI). A POI is a service-level training and education management document that describes a formal course in terms of structure, facilitation method, length, intended learning outcomes, and evaluation procedures.

Psychomotor Domain. A major area of learning which deals with acquiring the ability to perform discrete physical skills requiring dexterity, coordination, and muscular activity.

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 (e.g. measures of efficiency, participant observation, interviews).

Record of Proceedings (ROP). ROPs 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 school. The ROP provides a summary of evaluation results, recommendations, and justification for revising training.

Rehearsal. The process in which an instructor practices delivering a lesson.

Risk Management (RM). A process that assists organizations and individuals in making informed risk decisions in order to reduce or offset risk, thereby increasing operational effectiveness and the probability of mission success. It is a systematic, cyclical process of identifying hazards and assessing and controlling the associated risks. The process is applicable across the spectrum of tasks and missions, both on and off duty.

Safety Checklist. Evaluation instrument used by instructors or the administration to ensure that proper safety procedures are adhered to.

Safety Questionnaire. Student reaction form used to provide evaluation feedback on safety within the learning environment.

Simulation. A model of a system animated discretely or continuously over a period of time. A simulation may be closed-loop (i.e. it executes based in initial inputs without human intervention), or it may be open-loop (i.e. human input to alter the variables in the system during execution is allowed). A simulation is an approximation of how the modeled system will behave over time. Simulations are constructed based on verified and validated mathematical models of actual systems. Simulations can be very simple or complex depending on the degree of fidelity and resolution needed to understand the behavior of a system.

Skill. The ability to perform an activity that contributes to the accomplishment of the step, task, event, or job.

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.

Standing Operating Procedure (SOP). A document that outlines the policies and procedures of an organization.

Subject Matter Expert (SME). An individual who has a thorough knowledge of a job, duties/tasks, or a particular topic, that qualifies him to assist in the training development process (for example, consultation, review, analysis, advise, critique).

Summative Evaluation. Used to make judgments and determinations concerning student achievement and the effectiveness of the instructional program. 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.

Support Personnel. Support Personnel are primarily responsible for the general support of the Formal School (e.g. administration, supply, logistics, operations). Although support personnel focus on the day-to-day operations of the Formal School, they can also be requested to assist faculty members as an adjunct member.

Systems Approach to Training and Education (SATE). An orderly process that utilizes the Analyze, Design, Develop, Implement, and Evaluate (ADDIE) model to ensure personnel acquire the KSAs essential for successful job performance.

Target Population Description (TPD). The TPD provides a general description of an average student and establishes the minimum administrative, physical, and academic prerequisites each student must possess prior to attending a course. 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. All designated T&R Manual events for inclusion in a POI.

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.

Terminal Learning Objective (TLO). Describes the behavior a student is expected to perform upon completion of a lesson, topic, major portion of a course, or course completion.

Training. The process by which skills are developed through progressive repetition of tasks commensurate with required capabilities" - MCDP 1. Training can be executed across three domains: Live, Virtual, and Constructive (LVC) or a combination thereof.

Training and Education integration. Training and education are the two means to achieve learning required for operational demands. The underlying concept of training and education in the Marine Corps is that neither is mutually exclusive. This interdependency will further shape the preparation and conduct of training and education integration in pursuit of individual and unit expeditionary readiness. Each complements the other as they are blended along the continuum of professional development to produce tactically and technically proficient warriors.

Training and Readiness (T&R) Event. An event is a significant training occurrence that is identified, expanded and used as a building block and potential milestone for a unit is training. It may include formal evaluations. An event within the T&R Program can be an individual training evolution, a collective training evolution or both. Through T&R events, the unit commander ensures that individual Marines and the unit progress from a combat capable status to a Fully Combat Qualified (FCQ) status.

Training and Education System. The service-level application of the MCISD/SATE process used to define the training requirements for each Occupational Field (OccFld), MOS, skill area, or capability.

Transfer of Learning. The degree of the intended learning that was transferred to fulfill readiness needs across the Marine Corps. See near transfer and far transfer.

Transitions. Tie together the different components, methods, and main ideas within the lesson by smoothly summarizing one main idea and introducing the next idea.

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 that 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.

Values Based Training and Leadership (VBT/L). VBT/L are training requirements directed by CMC and CG TECOM and will be integrated in all applicable POIs as appropriate for the TPD. CG TECOM has determined that in order to satisfy the requirement, the most appropriate means of delivering VBT/L instruction is by facilitating a guided discussion and should be interwoven into the POI. It is understood that there are other ways this can be accomplished; however, leaders are expected to deliver VBT/L instruction in this manner across the Training and Education continuum.

Virtual (Training). Real people operating simulated systems. Virtual simulations inject humans-in-the-loop in a central role by exercising motor control skills (e.g., flying an air platform simulator, engaging targets in indoor simulated marksmanship trainer), decision skills, and/or communication skills.