MODULE 8: DOMAINS OF LEARNING

Cognitive Goals

At the completion of this module the student-instructor should be able to:

8.1 Use his or her own words to state a definition of cognitive, psychomotor and affective domains of learning
8.2 Identify the domain of learning and level of depth for a correctly written objective
8.3 Give examples of behaviors that exemplify the three domains of learning
8.4 Within the context of an EMS call, identify knowledge and behavioral examples for cognitive, psychomotor and affective domains
8.5 List classroom activities for each domain of learning
8.6 State at least one appropriate evaluation method for each domain of learning

Psychomotor Goals

8.1 There are no psychomotor objectives for this module.

Affective Goals

At the completion of this module the student-instructor should be able to:

8.1 Acknowledge the need to teach within the three domains of learning as identified within the National Standard Curriculum for any level of EMS course
8.2 Support activities that teach and evaluate the three domains of learning
8.3 Value all three domains of performance by the EMS professional

Declarative

I. Why this module is important
   A. "Pedagogy" is defined as the art and science of teaching
      1. Teaching is both art and science
      2. The art of teaching involves creative aspects like instructional design, developing classroom presentation skills, etc.
      3. The science of teaching is based in educational psychology and research and deals with learning theories and preferences, how people think, the domains of learning, and other aspects of learning
   B. The Domains of learning are a tool for understanding how people think, feel and act
   C. By understanding the domains of learning we can better plan what needs to be taught and how far we need to go through the material
      1. Also called "depth and breadth"

II. Domains of learning
- A. Developed by Benjamin Bloom, et al, in 1956
  1. His research described the major areas of learning and thinking and classified them into three large groups called the domains of learning:
     a. Cognitive (thinking)
     b. Affective (feeling)
     c. Psychomotor (doing)
  2. Figure 8-III shows the classification strategy for the three domains of learning by the degree of sophistication
     a. The degree of sophistication increases as you extend deeper into the list requiring greater depth and breadth for mastery of that level
- B. The domains of learning are used in instructional design to write goals and objectives for a curriculum
  1. Commonly used in EMS educational products
  2. Serve as a means for instructors to decide about depth and breadth issues when developing lesson plans
  3. Serve as a means for instructors to develop test questions

III. Levels within the domains of learning
- A. See appendix for Blooms Taxonomy
- B. As the student progresses from one level to the next within a given domain of learning a deeper and fuller understanding of the material is required
- C. Two strategies to classify these levels
  1. Lower and higher levels
     a. This strategy places the levels into two categories
     b. The first level (or first two levels) of each domain is considered the lowest level
        i. Levels beyond this level are considered higher levels
     c. Sometimes this strategy is confusing as there are no clear division points between high level and low level resulting in greater of subjectivity
  2. 3 level system
     a. Groups the levels of each domain into one of three categories: knowledge, application or problem-solving
     b. Knowledge: first (lowest) level
        i. Helps students comprehend facts, procedures and feelings
        ii. Includes simple skills or thought processes like imitation, recall, definitions of terms, receiving and responding to new information
     c. Application: second (some low some high) level
        i. Builds upon the foundation established in the knowledge level
        ii. Involves the integration and execution of principles, procedures and values within specific situations
        iii. Includes precision in the skills execution, the application of principles and valuing feelings and beliefs
     d. Problem solving: third (highest) level
        i. Builds upon the application level and indicates that mastery has been achieved

ii. Involves the analysis of information, procedures, and feelings in order to modify and adapt specific tasks depending upon situations
iii. When an individual is at the farthest part of this level they are capable of metacognition (thinking about thinking)

D. As stated previously, the language of the objective should clue you in to the level of depth and breadth you should cover for the material
E. The appendix has information on verbs commonly used to describe objectives for each domain of learning
   1. Common cognitive verbs: define, know, describe, design, analyze, discuss, and identify
   2. Common Psychomotor verbs: demonstrate, show, perform, and conduct
   3. Common Affective verbs: defend, appreciate, value, and model
F. You cannot push students through the levels
   1. They must be allowed to move from level to level on their own or with your guidance
   2. If you push them from one level to the next too quickly they will not learn the material and will make mistakes

IV. The Cognitive Domain
A. Deals with didactic information; knowledge and facts
B. Consists of six (6) levels of sophistication from simplest to most complex
   1. Knowledge (Level 1) memorization and recall
   2. Comprehension (Level 1) interpretation and understanding of the meaning behind the information
   3. Application (Level 2) application of classroom information to real-life situations and experiences
   4. Analysis (Level 3) separation of the whole into parts in order to analyze their meaning and understand their importance
   5. Synthesis (Level 3) combining of pieces of information into a new or different whole
   6. Evaluation (Level 3) making judgments and decisions about and with the information presented

V. The Psychomotor Domain
A. Deals with skills, actions and manual manipulation
B. Consists of five (5) levels from basic to complex
   1. Imitation (Level 1) repeated the example given by instructor or role model
   2. Manipulation (Level 1) practicing and creating his or her own style
   3. Precision (Level 2) performs skill without mistakes
   4. Articulation (Level 3) proficient and competent performance of skill with style or flair.
   5. Naturalization (level 3) mastery level skill performance without cognition
      a. Sometimes referred to as “muscle memory” or automatic

VI. The Affective Domain
- A. Deals with attitudes, beliefs, behaviors, emotions and how much value an individual places on something
- B. Considered the most difficult domain to evaluate
- C. Consists of five levels from simple to complex
  1. Receiving (Level 1) awareness of the value or importance of learning the information and a willingness to learn
  2. Responding (Level 1) willingness to actively participate in the learning process and deriving satisfaction from doing so
  3. Valuing (Level 2) perception that behavior has worth
  4. Organization (Level 3) integration of different beliefs, reconciling differences.
  5. Characterization (Level 3) development of one's own value system that governs one's behavior

VII. Some classroom activities to target each domain
- A. Cognitive-lecture, discussion, reading, diagramming, case studies and drills
- B. Psychomotor-skills practice, scenarios, simulations, and role playing
- C. Affective-modeling behaviors you expect the students to emulate (tolerance, punctuality, respect, kindness, honesty and integrity), role playing situations involving affective domain content, sensitivity training and awareness courses

VIII. Evaluation of the domains of learning
- A. Learning within one domain of learning is often interdependent with another domain
  1. Psychomotor skills development requires cognitive knowledge of the parts, concepts and processes for practice to be most effective
     a. For example: A student will achieve mastery of endotracheal intubation faster if he can identify the needed equipment, understand the indications for the skill, and recite the sequence of events for completion of the skill before he ever attempts the skill
- B. Some educational learning models encourage an environment where students do a high amount of experimenting as a means to learn, but even in these situations the student should be guided and mentored by the instructor
  1. These learning situations are most successful with students who possess a high level of self-directedness (ability to easily motive themselves who have a passion for learning)
- C. Review the course and lesson objectives to determine depth and breadth
  1. Try to teach one level deeper than the objective requires because over time, memory degradation will result in the loss of retention of some of the information
  2. Research shows that the more senses that are engaged in the learning process the more material is retained for a longer period of time
     a. We remember about 10% of what we read
     b. About 20% of what we hear
     c. About 30% of what we see
     d. About 40% of what we see and hear

e. About 70% of what we can describe and talk about (say)
f. About 90% of what we can say and do

3. Research also shows that the more times material is reviewed and reinforced the more it is retained in long term memory

D. Depth and breadth samples
1. Example 1: Objective A states the student should take a supplied list of names of 10 organs and label those organs on a mannequin and Objective B states the student should draw a human skeleton and label all of the major bones from memory
a. Objective A deals with a much lower level of cognition (knowledge) than objective B (synthesis) so you should be very thorough on teaching objective B compared to objective A
2. Example 2: Objective C states the student should be able to take an empty oxygen cylinder and switch the regulator to a full tank
a. If all you have ever discussed or demonstrated is how to open the tank and check it for leaks it is unlikely that your students will be successful in an evaluation of this skill
3. Example 3: Objective D states the student should be able to list the "5 patient medication rights" and you only stressed 3 or 4 of them
a. It is unlikely that the students will be able to successfully test on this objective unless they are highly self-motivated and learned it on their own through reading, a study group or a tutoring session

E. Cognitive knowledge of a skill does not imply competency in performance of the skills
1. Cognitive knowledge must be integrated with psychomotor skill practice and performance
2. For example: A student who can answer multiple-choice exam questions about the procedure for spinal immobilization is not necessarily able to fully immobilize a patient without compromising the spine

F. Evaluating the affective domain of learning
1. The appendix has a tool that will be useful in evaluating the affective domain
2. This tool comes from the DOT/NHTSA/HRSA EMT-P curricula

IX. Evaluation methods for each domain
A. Module 12 has general information on the concepts of evaluation
B. Modules 16, 17 and 18 contain additional information on the evaluation of each of the domains of learning
C. Cognitive-written examinations, static presentations, and oral examinations
D. Psychomotor-skill competency exam, scenario-based exam, evaluation in clinical or field setting, on-the-job performance
E. Affective-class participation, leadership, peer supervision, role modeling, adherence to policies

X. Most students have a preference or aptitude for one learning domain over another
A. Some students are excellent in the classroom, but struggle with the psychomotor skills of EMS, and vice versa

B. The EMS profession requires use of all three domains
   1. Minimum competency in all domains must be achieved for practice as a professional in EMS
   2. For example, an EMT must KNOW (cognitive) the indications for oxygen therapy, RECOGNIZE (cognitive) the signs and symptoms of respiratory distress, be able to ASSEMBLE (psychomotor) an oxygen tank and flow the oxygen, and APPRECIATE (affective) the level of distress and anxiety felt by the patient in order to effectively treat the patient

Bibliographical Resources

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