

The Learning Process



CHAPTER

4

NFPA 1041 Standard

Instructor I

4.3.2* Review instructional materials, given the materials for a specific topic, target audience and learning environment, so that elements of the lesson plan, learning environment, and resources that need adaptation are identified.

(A) Requisite Knowledge. Recognition of student limitations, methods of instruction, types of resource materials, organization of learning environment, and policies and procedures. [p. 58–69]

(B) Requisite Skills. Analysis of resources, facilities, and materials.

4.4.3 Present prepared lessons, given a prepared lesson plan that specifies the presentation method(s), so that the method(s) indicated in the plan are used and the stated objectives or learning outcomes are achieved.

(A) Requisite Knowledge. The laws and principles of learning, teaching methods and techniques, lesson plan components and elements of the communication process, and lesson plan terminology and definitions. [p. 58–62]

(B) Requisite Skills. Oral communication techniques, teaching methods and techniques, and utilization of lesson plans in the instructional setting.

4.4.5 Adjust to differences in learning styles, abilities, and behaviors, given the instructional environment, so that lesson objectives are accomplished, disruptive behavior is addressed, and a safe learning environment is maintained. [p. 65–69]

(A)* Requisite Knowledge. Motivation techniques, learning styles, types of learning disabilities and methods for dealing with them, and methods of dealing with disruptive and unsafe behavior. [p. 65–69]

(B) Requisite Skills. Basic coaching and motivational techniques, and adaptation of lesson plans or materials to specific instructional situations.

Instructor II

NFPA 1041 contains no Job Performance Requirements for this chapter.

Knowledge Objectives

After studying this chapter, you will be able to:

- Describe the laws and principles of learning.
- Identify the three types of learning domains.
- Define learning styles and discuss the effects of learning styles on the classroom.
- Describe learning disabilities and methods of dealing with learning disabilities and disruptive behavior in adult learners.

Skills Objectives

After studying this chapter, you will be able to:

- Analyze student learning styles and preferences.
- Demonstrate methods of dealing with learning disabilities.

You Are the Fire Service Instructor

You are preparing to teach an Introduction to Firefighting class. After working for several weeks by reviewing the curriculum and identifying learning objectives and outcomes, you have developed lesson plans, identified the resources needed to teach the class, and prepared the classroom for the first day. Your challenge is not just to master the curriculum, but also to teach all of the adult learners in the class, and to offer all students the best possible learning environment. Although you have been a fire service instructor for several years, you teach only occasionally. Wanting to do the best job you can, you consult some of the more experienced fire service instructors at the training center.

In your conversations with those fire service instructors, you are reminded about some of the basic laws and principles of learning and the ways in which that information can be used to assist you. You discuss learning domains, learning styles, and student behavior, and your colleagues offer some practical guidelines to help you meet the challenges of teaching the adult learner.

1. Is it valuable for you to know about your students' learning styles?
2. Why should you seek more information about the various learning domains?
3. What does knowing about learning styles and learning domains have to do with being a fire service instructor?

Introduction

Learning is a change in a person's ability to behave in certain ways. This change can be traced to two key factors—past experience with the subject (e.g., in the field) and practice (e.g., training in the classroom). Learning can occur both formally (inside the classroom) and informally (around the dinner table) (Connick, 1997). Formal learning does not occur by accident—it is the direct result of a program designed by an instructor (Butler & McManus, 1998). An adult learner may intentionally set out to learn by taking classes or by reading about a subject. He or she may also gather information through the experience of living that changes the learner's behavior. Informal learning occurs spontaneously and continually changes the adult learner's behavior. Ideally, learning is created through the blending of individual curiosity, reflection, and adaptation (Stewart, 2003).

Learning takes time and patience. As the fire service instructor, you have the opportunity to positively influence fire fighters at all levels of the fire department **FIGURE 4.1**. You are a leader and have a responsibility to teach information, hone skills, and promote positive values and motivation in your students.

The Laws and Principles of Learning

Numerous theorists, including Edward L. Thorndike and his contemporaries Edwin R. Guthrie, Clark L. Hull, and Neal E. Miller, have studied learning and developed ideas that have



FIGURE 4.1 As the fire service instructor, you have the opportunity to positively influence fire fighters at all levels of the fire department.

become recognized as the basic laws of learning. According to Thorndike, there are six laws of learning:

1. *The law of readiness:* A person can learn why physically and mentally he or she is ready to respond to instruction.
2. *The law of exercise:* Learning is an active process that exercises both the mind and the body. Through this process, the learner develops an adequate response to instruction and is able to master the learning through repetition. For



FIGURE 4.2 Adult learners use the five senses (hearing, seeing, touching, smelling, and tasting) to obtain information.

example, a fire fighter can master ropes by practicing tying knots every night for a month.

3. *The law of effect:* Learning is most effective when it is accompanied by or results in a feeling of satisfaction, pleasantness, or reward (internal or external) for the student—for example, when the student receives an A on a pop quiz.
4. *The law of association:* In the learning process, the learner compares the new knowledge with his or her existing knowledge base. For example, suppose a new type of nozzle arrives at the fire department. During training, fire fighters will compare the new nozzle with the nozzles with which they are already very familiar, having used them countless times at incidents.
5. *The law of recency:* Practice makes perfect, and the more recent the practice, the more effective the performance of the new skill or behavior. Running drills on new skills will reinforce and perfect training in fire fighters.
6. *The law of intensity:* Real-life experiences are more likely to produce permanent behavioral changes, making this type of learning very effective. A student can hear your lecture on the importance of always wearing full personal protective equipment at an incident a dozen times, but the lesson might not really sink in until the helmet prevents a concussion during an incident (Thorndike, 1932).

Adult learners use the five senses (hearing, seeing, touching, smelling, and tasting) to obtain information **FIGURE 4.2**. The type and number of senses used to learn determines how learning occurs and what is remembered. Seeing (e.g., a visual demonstration of a skill) is generally the most effective means of learning, followed by hearing (e.g., listening to a lecture), smelling (e.g., smelling smoke), touching (e.g., handling fire equipment), and tasting (rarely used in training fire fighters).

■ The Behaviorist and Cognitive Perspectives

Two schools of thought have developed to explain how behavior evolves: behaviorist and cognitive. According to the [behaviorist perspective](#), learning is a relatively perma-

nent change in behavior that arises from experience. Not all changes in behavior reflect classroom learning. Many changes in behavior take place owing to a person's maturation and physical changes as he or she ages (Rathus, 1999).

According to the [cognitive perspective](#) (mental), learning is an intellectual process where experience contributes to relatively permanent changes in the way individuals mentally represent their environment. Cognitive theories stress the use of mental capabilities to change behavior. Cognition is defined as the acquisition of knowledge through the use of perception, encounters with ideas, and obtaining of experiences (Lefrancois, 1996). Thus cognitive learning is demonstrated by recall of knowledge and use of intellectual skills. It entails the comprehension of information, organization of ideas, analysis and synthesis of data, application of knowledge, choice of alternatives in problem solving, and evaluation of ideas or actions. According to this perspective, learning is an internal process that is demonstrated externally by behavioral changes.

■ Competency-Based Learning Principles

Learning that is intended to create or improve professional behavior is based on performance, rather than on content. Such [competency-based learning](#) is usually tied to skills or hands-on training. Not surprisingly, much of what is accomplished on the fire ground occurs through hands-on activities that require proficiency with skills—for example, the ability to force entry on a door. Competency-based learning is based on what the adult learner will do.

Competency-based learning originates with the identification and verification of the needed competencies to perform particular skills. The competencies are actually job requirements, and ideally they will have been identified through a job analysis. Once the job requirements have been identified, they can be used as course goals and put into written form as lesson objectives.

To ensure the success of a competency-based course, it is essential to follow a standardized process. This process ensures that each successive step has the proper foundation. Without the proper foundation, what may look like an excellent course might not address the real skills issues of the fire department. The design of a competency-based course requires the following components:

- Competencies exist.
- Job analysis is performed.
- Standards are identified and set.
- Course goals are identified and written.
- Lesson objectives are identified and written.
- Competency-based instruction is delivered.

The most critical facet of competency-based learning is the notion that the skills must be mastered by the adult learners for each of the competencies. To ensure that this requirement is met, students must be given enough time and appropriate instruction to both learn and master the skill. You and the students must understand that with mastery comes the responsibility of maintaining a particular performance level. Thus learning objectives, instruction, and the evaluation of



FIGURE 4.3 Immediate feedback needs to be given on the training ground to ensure that each student masters the skill.

Teaching Tip

Instructors always need to be thinking about what might help their students learn. The creation of an environment that addresses the physical, emotional, and cognitive needs of all students provides for a successful learning experience. To achieve this kind of supportive environment, make sure that your classroom accommodates differences in students' learning styles.

Teaching Tip

The use of teams can be an especially helpful strategy in the classroom setting. It allows students to work with people who differ from them in terms of how they learn, think, or respond.

the skills must be tailored to performance in the field, not just to the acquisition of abstract knowledge.

A competency-based learning course must be flexible enough to be adapted to the needs of all students. Each student inevitably learns at his or her own pace and in his or her own individual fashion. Some students may take longer than others to learn the skill, so you must take each individual's preferred learning style into account when teaching skills. Also, appropriate and immediate feedback needs to be provided to students to allow them to achieve mastery level of the skill **FIGURE 4.3**.

Forced Learning

There is an important fact of which you need to be aware: Adults cannot be forced to learn. Unfortunately, there are too many adult learners who attend training programs or engage

in educational situations only because they are required to do so. Owing to the dynamics of the fire service, there always seem to be new continuing education credits to be accumulated for recertification or some new required certification to be obtained. Mandating learning often results in a lack of motivation in classroom activities and a poor attitude toward the learning process in general, which present quite a challenge to the fire service instructor.

The presence of students who are mandated to attend a class or training session should alert you that the lesson plans might need to be altered. For example, if you are assigned to teach a CPR recertification course to paramedic students, then you might look for ways to involve students in both the teaching process and the learning process. The creation of such dual roles will help capture their attention.

Areas of Interest

All adults have certain areas of interest. These areas may help reinforce the desire to learn. The source is less important than its mere presence; because all students need to have encouragement if learning is to take place. This positive reinforcement can serve to increase the motivation of students who are forced into your classroom. You may need to acknowledge the

Ethics Tip

One method that is routinely used to encourage learning from forced participants is tapping into the participants' knowledge and letting them teach from their experiences. Is it ethical to have someone other than the assigned fire service instructor present the instructional material? Would it be ethical for a college business professor to have a student with equal business experience teach other students in an effort to maintain that student's interest in the class?

Like all ethical dilemmas, both situations have positive benefits. Having an otherwise disengaged student present instructional material will increase the learning for *that* particular student. Also, other students often learn much from the student presenter, with who they can identify more easily. However, if the other students do not receive the necessary instruction, or if there is the perception that they may not receive proper instruction, this practice can be detrimental. Having the assigned fire service instructor teach the material ensures quality and quantity.

When an experienced student is forced to attend your class and you are thinking about taking advantage of that student's value as a peer-teacher, consider the material, the experience of the student, the reputation of the experienced student among his or her classmates, and the reaction of the other students to a "guest" presenter from their own class. Most fire service instructors would agree that the student should not do the majority of the teaching because students have paid to benefit from the instruction of the professional fire service instructor; however, allowing the experienced student to assist in teaching small components might be acceptable to both the class and the experienced student.

Applying the JOB PERFORMANCE REQUIREMENTS (JPRs)

Every student in each class you instruct learns at a different rate with different levels of comprehension and understanding. Likewise, each student responds differently to the methods of instruction that are used in a class. An experienced fire service instructor knows how to adapt a lesson plan while the presentation is under way. The need for such flex-

ibility may be one of the more difficult tasks for new fire service instructors to understand. The goal of any presentation is to improve the student's understanding of the objectives. To do your job correctly, you must have a working knowledge of the learning process. Your understanding of these factors is critical to the success of your entire class.

Instructor I

The Instructor I will deliver a prepared lesson plan using a variety of instructional methods. The appropriate method to be used might be identified after review of the content of the lesson plan, and perhaps even more by the analysis of the audience who will participate in the training. Student-centered delivery with the students involved in the learning will normally make the longest-lasting impressions on the students' learning.

Instructor II

When developing objectives and lesson plan content, the Instructor II must be aware of the various domains of learning and the levels of comprehension intended for the students. The objective must be written to the appropriate level and applications in the lesson plan must be developed to help students apply what they have learned. Such exercises check the students' understanding of course content.

JPRs at Work

Review your assigned lesson plan and determine the best methods of presenting the material based on the objectives and evaluations developed for the class. Adjust the lesson plan delivery based on the students' understanding and progress through the material.

JPRs at Work

NFPA does not identify the JPRs that relate to this chapter. Nevertheless, it is important to understand how students learn and the most effective ways of instructing so that you can be the most effective instructor possible.

Bridging the Gap Between Instructor I and Instructor II

Often a coffee-table discussion between instructors at different levels can assist in determining the best methods of delivering a prepared lesson plan. The Instructor II will typically have more experience in the development and delivery of training and should mentor the Instructor I in ways to engage the students in the learning process so as to achieve better outcomes. Select appropriate methods of instruction by understanding the learning process.

Instant Applications

1. Review the laws and principles of learning, and identify an instructional method that incorporates each of these laws and principles.
2. Make a list of the students you will have in upcoming classes. Based on their knowledge, experience, and other instructional factors, identify the ways each of these students might learn and determine how you can make adaptations appropriate for the entire class.
3. Review how you would try to increase your students' understanding of basic material by adjusting the lesson plan to meet individual needs.

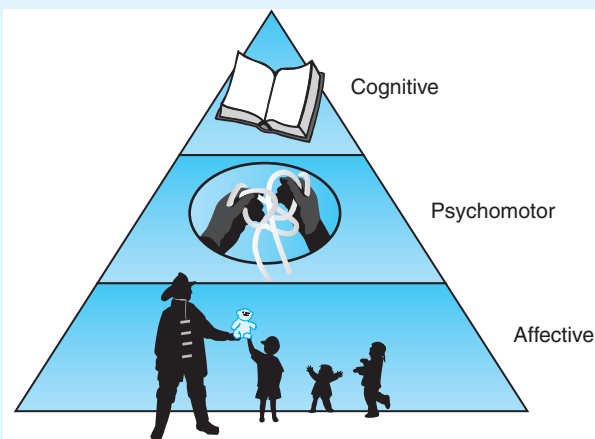


FIGURE 4.4 The three types of learning domains are cognitive, psychomotor, and affective.

Teaching Tip

To be a great fire service instructor, you must truly know yourself. Some of us are excellent speakers, while others are effective writers. What are your strengths? What do you need to work on? Taking a personal inventory assessment such as the Myers–Briggs Type Indicator can clue you in to behaviors you may need to improve.

Safety Tip

Sometimes you will find that the fire fighters in your department are ready and willing to learn and experience training—as a group. When it comes down to individual fire fighters, however, blocks to learning may spring up. For example, a fire fighter may be tired and unable to concentrate because he worked an incident all night. When basic needs are not met, learning becomes a second priority, which can in turn create a safety issue. A student may perform an unsafe act due to his or her physical or mental state, or a student may miss information that he or she must be able to perform on actual incidents because of inattention.

areas of special interest of reluctant students to guide them through the learning process and keep them engaged in your class. Knowing your students and their areas of interest allows you to tap into their knowledge base and become a more effective fire service instructor.

Learning Domains

In 1956, Benjamin Bloom and his research team identified three types of **learning domains** (categories in which learning takes place) **FIGURE 4.4**:

- **Cognitive domain:** knowledge
- **Psychomotor domain:** physical use of knowledge
- **Affective domain:** attitudes, emotions, or values

Today, Bloom's classification system is widely known as Bloom's Taxonomy of the Domains of Learning. **Bloom's Taxonomy** has had a widespread influence in the field of learning research. Researchers have since developed new strategies of classifications and identified additional learning domains to build upon Bloom's original taxonomy.

While Bloom identified three general learning domains, the learning process seldom takes place solely in one domain. Additionally, within each of the domains, the levels of learning build one upon the other. These levels, which have been expanded and refined by subsequent researchers, serve as the building blocks of the learning process. Within each level are found three basic sublevels: knowledge, application, and problem solving. Being aware of these levels and Bloom's three original learning domains will assist you in developing lesson objectives and course material that will address a specific level of learning.

Cognitive Learning

The most commonly understood of the learning domains is cognitive learning, which results from instruction. Bloom's Taxonomy distinguishes six levels of cognitive learning:

- **Knowledge:** remembering knowledge acquired in the past
- **Comprehension:** understanding the meaning of the information
- **Application:** using the information
- **Analysis:** breaking the information into parts to help understand all of the information
- **Synthesis:** integrating the information as a whole
- **Evaluation:** using standards and criteria to judge the value of the information

Each of these levels builds on the previous one. The most basic is the knowledge level; the highest is the evaluation level. By having an understanding of the cognitive domain of learning, you will be able to build more effective lesson plans and utilize students' thinking processes to encourage them to learn the information and apply that new knowledge. Adult learners should be able to fit the abstract thinking, facts, and information you present into the context of their jobs.

Consider these examples of cognitive learning and its application for fire fighters:

- **Learning terms, facts, procedures, or principles:** The fire fighter uses cognitive learning to learn the standard operating procedures of the fire department.
- **The ability to translate and explain facts and principles:** The fire fighter is taught the basic principles of fire and then asked to identify fuel types.
- **The ability to apply facts and principles to a new situation:** The fire fighter is able to size up the scene, formulate a plan based on that analysis, and evaluate all possible outcomes.

Psychomotor Learning

For fire fighters, psychomotor learning is the most common learning domain. The term "psychomotor" refers to the use of the brain and senses (*psycho*) to tell the body what to do and

the use of the muscles (*motor*) to tell the body how to move. The psychomotor learning domain involves the ability to physically manipulate an object or move the body to accomplish a task or perform a skill. This kind of learning is also referred to as **kinesthetic learning**.

As in the cognitive domain, the learning phases in the psychomotor domain build progressively one upon the other. According to Bloom's Taxonomy, there are six levels:

- Observation: watching the skill or activity being performed
- Imitation: copying the skill or activity in a step-by-step manner
- Manipulation: performing the skill based on instruction
- Precision: performing the skill or activity until it becomes habit
- Articulation: combining multiple skills together
- Naturalization: performing multiple skills correctly all the time

Each level of learning in the Bloom's Taxonomy psychomotor domain builds upon the previous level: observation → imitation → manipulation → precision → articulation → naturalization. By understanding that the physical use of knowledge is the basis for students learning to perform the skill, you will be able to develop a lesson plan that involves demonstrating the skill to students, who then practice until they are able to flawlessly perform that skill. As students progress from one level to the next within the psychomotor domain, they may experiment with new ways to perform the skill. This trial-and-error process is completely natural as students learn how to adapt the skill and become more familiar with the activity.

Awareness of the following aspects will assist you in teaching the psychomotor skill and developing an effective lesson plan:

- Gross body movement: the ability to move the arms, legs, and shoulders in a coordinated controlled manner
- Fine motor control: the ability to use hands, fingers, hand-eye coordination, and hearing
- Verbal behaviors: using sound to communicate
- Nonverbal behaviors: using facial expressions and body gestures to communicate

In your development of lesson plans, ideally you will identify how a student should perform a skill or activity by carrying out a task analysis and identifying the steps involved in performing the activity. Here are some examples of psychomotor learning and its application:

- Comprehensive skill approach: The skill is demonstrated by you and the fire fighter watches.
- Step-by-step approach: The fire fighter performs the skill in a precise step 1, step 2 manner until the entire skill activity is accomplished.
- Repetition of the skill or activity until it becomes habitual and is correct: The fire fighter performs the skill until it becomes second nature and he or she executes the skill flawlessly. The instructor then



FIGURE 4.5 Practice makes perfect.

presents “what if” questions to help the student determine when to perform the skill.

- Combining multiple skills together: The fire fighter is able to adapt to changing situations and defend his or her choice of skills for the activity.
- Performing multiple skills correctly all the time: The fire fighter can perform the skill and it is truly a natural activity despite the environment or circumstance in which the skill is performed.

For students to properly learn skills or activities, they need to practice, practice, practice **FIGURE 4.5**. As the brain processes the attempts at performing the skill, it also learns to avoid what does not work or what was in error.

■ Affective Learning

Affective learning is the feeling or attitude domain. It focuses on those characteristics that make each person unique—that is, an individual's preferences, perceptions, and values. Many of these characteristics will have evolved in individual fire fighters over long periods of time, so attitudes may not change immediately after the introduction of a new concept. Instead, learning within this domain progresses from simple awareness, to acceptance, to internalization, to finally acting out the attitude. Bloom's Taxonomy identifies five learning levels within the affective domain:

- Receiving: becoming aware of the skill or concept
- Responding: acknowledging the implications of the skill or concept and altering behavior accordingly
- Valuing: internalizing the skill or concept and having it become part of everyday life
- Organizing: comparing and contrasting skills or concepts
- Characterizing: adopting and personalizing the skill or concept

Each level of learning in the Bloom's Taxonomy affective domain builds on the previous level: receiving → responding → valuing → organizing → characterizing. Because much of



Voices of Experience

As a new fire service instructor, I held the belief that I could apply the same methods of instruction that I had experienced in grammar school, high school, and college to the fire service instructional process. I quickly realized that in a volunteer organization, a majority of which was staffed with senior members who had 20 years of volunteer service, that lectures, written tests and overhead transparencies wouldn't translate well. These students wanted to be involved and share experiences.

"These students wanted to be involved and share experiences."

Firefighters with various educational backgrounds and learning abilities need basic lesson plans and training drills to be taught at a uniform level but with applications of the class content adapted to the skill level of each person. I found that using a blend of several instructional methods achieved this. For example, newer members responded to visually based instruction while more experienced members responded to participatory learning and skill demonstration.

Identification of skills and weaknesses and knowing your audience before you begin any learning process helps the instructor be better prepared to present the material. When preparing for a class, I try to remember how I learned the topic I am about to teach, what presentation techniques worked and what did not along with how today's learning environment and learning needs have changed. I consider empathy, or what it's like to be the student as an important consideration in the learning process. I also consider who the audience will be and then try to identify the best methods of instruction and any barriers to the instructional process. Other things I consider are the experience levels of the students, the level of the objectives or course content, the presentation methods necessary to deliver the material and any physical characteristics of the training area. If the training is to be practical or hands-on in nature, always consider the time needed to give all the participants an opportunity to perform the skill and an opportunity to review their performance with the instructor. Each participant will perform the skills at different levels and each participant will require instructor attention and feedback.

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this learning takes place inside the mind, it is important to look for subtle changes in students to confirm that affective learning is occurring. Here are some examples of affective learning:

- Acquisition of new values: The fire fighter is willing to learn the information and attends class regularly.
- Acknowledgment of the concept: The fire fighter studies for tests and participates in class activities.
- Internalization of values: The fire fighter volunteers to participate in an extra-credit activity.
- Internalization of the organization of information: The fire fighter decides to pursue continuing education because the additional training can keep him or her abreast of new developments and technologies.
- Full adoption of the new values: The fire fighter decides to pursue a degree in fire service management.

The affective domain is difficult to measure, but it should not be overlooked. The instructor must be observant to identify a student's reaction to the learning situation and changes in his or her value system.

Teaching Tip

Exercises that force students to compare two events involving similar problems demonstrate how different values may be applied to similar situations as well as how values may differ from one situation to another. For example, ask students to consider two different room and content fires: one that involves entrapment of children in their home, and one that involves entrapment of adults in a crack house. How do students perceive each of these scenarios?

Learning Styles

What Is a Learning Style?

When preparing for a class, you must ask, "What is learning?" as well as "How does a particular individual learn?" To answer these questions, you need to recognize that each student has a different **learning style**—that is, a way in which he or she prefers to learn. During the internal process of learning, a person encounters new information, analyzes it, and rejects or adopts it. Each and every adult learner has a distinct and consistently preferred way of perceiving, organizing, and retaining information. Learning styles are habitual modes of processing information; they show an individual's predisposition to adopt a particular learning strategy, regardless of the specific demands of the class. To use the terminology introduced by Bloom's Taxonomy, learning styles comprise characteristic cognitive, psychomotor, and affective behaviors.

The process of learning directly relates to the learning environment and interactions that are influenced by an individual's preferred learning style. These interactions are the central elements of the learning process and show a wide variation in terms of their pattern, learning style, and quality.

Although learning is an invisible mental and emotional process, the results of the learning process are frequently visible in that they may be traced back to certain experiences (e.g., a training session) and are evident in behaviors (e.g., performance of a skill).

Learning Styles' Effects on Training and Educational Programs

If you teach in a manner that favors a student's less preferred learning style, you need to be aware that the student's discomfort level may interfere with learning. Therefore, it is beneficial to recognize and understand all student learning styles. This knowledge comes from knowing your students. If you are new to the organization or are serving as guest speaker, then discovering students' preferred learning styles could present quite a challenge. Nevertheless, members of a profession or group often show a decided tendency toward certain learning styles. Part of your presentation preparation may be to contact the agency ahead of time and gather specific information about the audience's demographics, their learning backgrounds, and experience levels. Of course, it is inappropriate to make assumptions about a group simply based on one single group identifier. For example, if you were assigned to teach a group of senior citizens in an assisted living center and assumed that all of them would be in wheelchairs, you would be very surprised to learn that most of them cook or play golf and lead very active lives.

The ability to learn is not solely dependent on your use of the student's preferred learning style. Most adult learners will adapt their learning styles and use nonpreferred learning styles if necessary. For example, a study by Mel Silberman in 1998 revealed that in every group of 30 learners, 22 are able to learn effectively as long as the instructor provides a blend of visual, auditory, and kinesthetic activity. The remaining eight learners have a much stronger preference for a certain learning style and may struggle to understand the information unless special care is taken to present the material in their preferred learning style.

To see how this works in practice, consider a group of fire fighters in a class on fireground support operations. Although the majority of the class wants to immediately start placing ladders and practicing ventilation, a minority prefer to watch a video and discuss the skills before actually practicing the operations (**FIGURE 4.6**). Both groups want to learn, but the process is different for each. Always take everyone's learning style preferences into account.

A learning style is a characteristic indicator of how a student learns, likes to learn, and learns most effectively. Given the importance of understanding the fire service and those who work in it, you can imagine how your appropriate use of this knowledge might affect fire fighters' training and educational opportunities. An understanding of the preferred learning styles of fire service personnel is a valuable tool for fire service instructors and curriculum designers. Identifying any patterns of learning that are common among firefighting personnel may serve to improve instructional methods



FIGURE 4.6 Both fire fighters want to learn how to raise the ladder; they simply have different learning styles.

and curriculum content for educational courses and training geared toward fire fighters. In short, a thorough understanding of the audience's preferred learning style makes for better curriculum developers, trainers, and fire service instructors. As in any field, the development of a well-balanced program encourages learning by optimizing the learning styles of the learners and enhancing their learning experiences.

By understanding learning styles, you will gain some basic understanding of the strengths and weaknesses of the average fire service student. This information is essential given the trend toward more continuing education for fire personnel. A myriad of new education and training programs for the fire service are being developed to meet the demands of the industry, increase skills, and elevate the level of professionalism. These courses are designed to include not only the cognitive domain for recall, but also application of new skills, problem solving, and the psychomotor skills.

To accommodate this expanded scope of learning, course designers and fire service instructors need to have an even deeper understanding of their audience. By understanding learning style preferences and determining how those learning styles form patterns based on the audience, you should be able to increase the amount of learning that actually occurs in the classroom.

Training and education for the fire service must change to meet the needs and wants of these fire fighters. The increasing

diversity of fire personnel—both in terms of backgrounds and learning styles—presents an especially thorny challenge for today's fire service instructors, who must strive to deliver increasingly complex information to a broader range of students. Traditionally, the fire service focused on the physical activities associated with extinguishing fires and providing rescue services. In the past, training was the key to developing skills. In the last 15 years, the scope of the fire service has expanded dramatically to include responding to terrorism, dealing with chemical and biological warfare threats, and managing new medical technology. These more sophisticated demands require similarly more sophisticated training that goes beyond hands-on activities to encompass education in explosives, chemistry, and computers—and, likewise, new methods of instruction and learning techniques.

Safety Tip

Using the appropriate teaching style for each adult learner will increase safety.

Although there has been speculation about the preferred learning styles of fire service personnel, little scientific research has been done to support or investigate that speculation. Three decades of experimenting with learning styles of non-fire service personnel has convinced hundreds of administrators and educators of the effectiveness of teaching by first identifying, and then complementing, how each person begins to concentrate on, process, internalize, and retain new and difficult information and skills. Once the learning styles of students have been identified, you can select the best teaching approach.

Measurement of Learning Styles

Generally speaking, the researchers that are focused on learning styles are divided into two distinct camps: those supporting a narrower view that emphasizes the cognitive learning domain, and those supporting a broader view that encompasses other learning-related factors, such as motivation and personal preferences (Biggs, 1993). In the former group, David Kolb suggested that individuals are likely to feel most comfortable in one of four learning modes: using either abstract or concrete perception and either active or reflective processing. His Learning Style Inventory (LSI) instrument, which is designed to determine a person's placement along these dimensions, is a model of cognitive processing—that is, how we process learning in the brain (Kolb, 1995).

In general, distinctions in three or four different learning styles are well accepted as more or less prototypes of learning styles. A variety of instruments have been developed to measure an individual's affinity for particular styles (Semeijn & van der Velden, 1999). With any of these instruments, caution needs to be taken to ensure that what is being inventoried is learning style and not personality type.

Some researchers have focused on the [visual, auditory, and kinesthetic \(VAK\) characteristics](#) of learning styles based on the idea that we all seem to have a learning style preference based on sensory intake of information. Adult learners use all three of these sensory functions to receive information, although one or more of these receiving styles is normally dominant and hence filters the information received. The most common form of information exchange is speech, which arrives in the adult learner's ear and is considered to be an auditory means of learning. In a visual characteristic, information arrives in the form of graphs, charts, pictures, color and layouts, maps, or patterns. An adult learner using the kinesthetic characteristic would include the senses of touch, hearing, smell, taste, and sight. These adult learners want concrete, multisensory experiences as they learn. The VAK learning style focuses on the *how* of learning; it does not concern itself with the *why* of learning styles.

Even though the eyes take in all visual information, information is perceived differently, which in turn leads to subtle differences in students' learning styles based on the visual component of the VAK model (Fleming & Mills, 1992). For example, sometimes the information is largely composed of printed words, from which some students appear to get a greater or lesser degree of understanding; at other times the information consists of mostly graphic elements. Fleming (1995) suggested a modification to the basic VAK scheme in which the visual characteristic is divided into iconic (symbolic) and textual characteristics. Iconic characteristic visualizers learn more effectively when they are exposed to diagrams, symbols, and other graphic matter. Textual characteristic visualizers prefer the printed word, which includes both reading and writing.

The [VARK Preferences](#) instrument is a learning styles inventory designed to help students identify how they prefer to learn in terms of the previously described visual, auditory, read/write, and kinesthetic characteristics (Fleming, 2001). Developed in 1997 by Fleming at Lincoln University in New Zealand, VARK contains 13 questions whose answers provide students with an indication of their personal learning preferences.

The learning preferences identified via the VARK Preferences questionnaire indicate the ways the adult learner wants to take in or give out information in a learning context. The four categories of learning preferences seem to reflect the experiences of the students when they are taking in or giving out information fairly accurately. The categories overlap to some extent, but Fleming has defined the following dimensions:

- **Visual (V).** This perceptual mode emphasizes a preference for the depiction of information in charts, graphs, flow charts, and all of the symbolic arrows, circles, hierarchies, and other devices that instructors use to represent what could have been presented in words. This definition does not include the use of television, videos, films, or computers. Instead, most of these media are considered primarily aural and kinesthetic because of their presentation of sound and reality.
- **Aural (A).** This perceptual mode describes a preference for information that is “heard.” Students with this preference report that they learn best from lectures, tutorials, tapes, and talking to other students.
- **Read/write (R).** This preference is for information displayed as words. Many academics have a strong preference for this modality.
- **Kinesthetic (K).** This modality includes a preference for experience and practice with the information, such as hands-on training or use of a simulator. Although such an approach may invoke other modalities, the key is that the student is connected to reality, either through experience, example, practice, or simulation.

A fifth category (multimodals) was added to the VARK Preferences questionnaire when it was found that the majority of adult learners actually have multiple preferences for learning styles. Some multimodal students may need to process information in more than one mode to learn effectively (Fleming, 1992).

VARK is structured specifically to have practical implications—namely, to improve learning and teaching. The VARK Preferences inventory, which is available for free on the Web, has been widely accepted as both practical and thought provoking (Fleming, 1992). Its results can be used in both course design and classroom activities, as students often find their scores highly provocative. In particular, you may be able to better design lesson plans and present information if you have an idea of the learning styles of your students. It is also beneficial to take the VARK questionnaire yourself, because your teaching style often matches your preferred learning style—which may not match the preferred learning styles of your students. It is important to focus on students' learning styles, employ a particular method of instruction, and not neglect the needs of adult learners who are different or who require an alternative method of instruction.

Learning Disabilities

As a fire service instructor, you may encounter students with a wide variety of learning disabilities. The Americans with Disabilities Act (ADA—federal legislation that was originally passed in 1990) classifies learning disabilities into these major categories:

- Reading disabilities range from the inability to understand the meaning of words to the inability to read or comprehend to dyslexia. This disability could become apparent in class if a student is asked to read a section of course material aloud or to summarize a paragraph from a textbook.

Teaching Tip

The VARK questionnaire can be downloaded from the Internet (www.vark-learn.com), filled out by students, and graded by both the students and you. The results could be used as a point of discussion to learn about preferred learning styles. It is self-defining and directed activity.

- Some students lack the ability to write or to spell or to place words together to complete a sentence. This type of disability, which is referred to as **dysphasia**, might present itself when a student submits work for a course and the work is poorly written.
- Other students might suffer from **dyscalculia**, or difficulty with math and related subjects. Students with this disability might struggle on a hydraulics course or test.
- **Dyspraxia** is the inability to display physical coordination of motor skills. This condition could be observed on the training ground with a student's inability to complete a task such as climbing a ladder.
- A disorder that affects children but can be carried into adulthood is known as **attention-deficit/hyperactivity disorder (ADHD)**. A person with ADHD has a chronic level of inattention and an impulsive hyperactivity that affects his or her ability to function on a daily basis. This disorder is a documented condition identified by the Centers for Disease Control and Prevention (CDC). Although it can be treated, there is no known cure.
- Other types of disabilities could also affect the learning process, such as color blindness or poor vision. Some adult learners may have poor hearing and cannot properly hear material presented in the classroom.

Knowing and understanding each of these learning disabilities will help you teach. Unfortunately, in most cases you will not know that students have these problems until a class has already begun. If you are a guest lecturer, you will not get the opportunity to know your students until after the first few hours of instruction. Once you have identified students with some type of learning disability, then you need to adjust your teaching as necessary. There are many ways to help students in your class who are struggling to learn. For example, a few positive words in private or suggestions on a written assignment might help a struggling student to understand a concept that is just beyond his or her reach. Students who have learning disabilities are not unintelligent or unable to learn; they simply learn in different ways. They usually have average to high intelligence, but they may perform poorly on tests because of their disabilities if accommodations are not made for their special needs.

Disruptive Students

Other types of students may pose challenges as well. For example, some students, for one reason or another, feel the need to establish their presence in the class by acting out in other ways. This was also discussed in Chapter 3.

- The class clown feels the need to make comments or jokes about the course material or perhaps others in the classroom.
- The class know-it-all has been there and done that already, regardless of the topic.
- The gifted learner is very familiar with the course material or has the ability to read quickly. This individual becomes bored because he or she is so far ahead of the rest of the class.

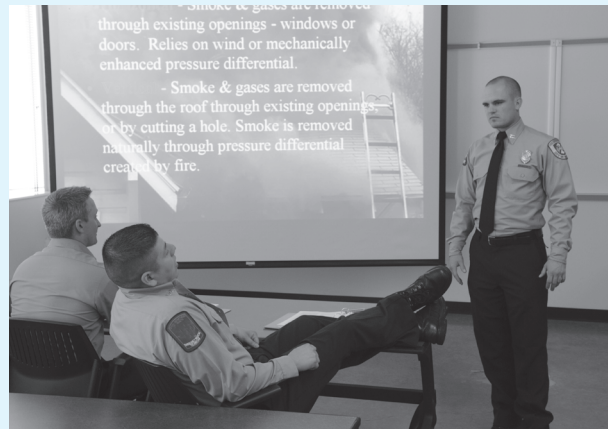


FIGURE 4.7 Remember how your second-grade teacher silenced the class with one look? That same look works with adults, too.

Most often, these types of students have other underlying issues that cause them to seek out attention in a negative way. A variety of methods may be used to deal with these types of students, but in general the most effective method is to minimize their impact on the class by not giving into the same type of behavior. Most often a stern look is enough to get a class clown to stop cracking jokes **FIGURE 4.7**. If this doesn't work, then engage the student with a question that is meant to bring him or her into the class discussion. If this technique doesn't work, then at the next break a one-on-one discussion might be appropriate. The last step in dealing with a student who wants to continue to disrupt the learning environment would be to ask him or her to leave the class. In using this form of progressive discipline, the goal is to bring the student back into the classroom in a positive way that does not embarrass the student or you as the instructor.

A student who is a hesitator may be suffering from a learning disability. Such a student is often shy, reluctant, at a

Ethics Tip

Is it ethical to explain an unfamiliar term to a student during an exam? For example, suppose a student is asked to "select a type of ritual" and one of the answers is "tenure." If the student does not know the term "tenure," is it ethical to explain it?

Again, a dilemma occurs when both instructor and student are trying to achieve a positive result. Not allowing any help during an exam achieves the goal of a level playing field for all students in the class. At the same time, the goal of learning is to see what the student knows. If the point of the exam is to see if the student knows what a ritual is, and not what tenure is, explaining the term "tenure": would allow for the exam to determine whether the student understands the term "ritual."

Ethical dilemmas have no easy answer. Using sound judgment and reasoning is required to determine the appropriate action.

Theory into Practice

To identify which kinds of learners—visual, auditory, or kinesthetic—are present in your classroom, try the following exercise:

Tell students to sit quietly for 5 minutes—no reading, no talking, and no moving around. Observe what the students are doing. You may want to jot down some notes about each student so you can share your observations with them at the end of the 5 minutes.

- The visual learner will look around and absorb or read everything he or she sees.
- The auditory learner will mumble or make some kind of sound.
- The kinesthetic learner will fidget, may get out something to doodle on, or slump comfortably in his or her seat.

This may not be the most accurate or fun activity, but your observations will provide some valuable information about your students. You can provide feedback to the students about their behavior, and over time you should be able to see how accurate your observations are. Use this exercise as a springboard for your discussion on learning styles and behavior.

Teaching Tip

When teaching adults, you are really more of a facilitator than a traditional teacher. Here are some core qualities that will help you become a good facilitator:

- Be genuine in your relationships with adult learners, rather than consistently adhering to the traditional role as “teacher.” Show you really care about the students and their success in the classroom.
- Accept and trust in the adult learner as a person of worth. Provide positive reinforcement, and engage the learner with respect and value. Remember—people learn more from individuals whom they trust than from individuals whom they mistrust. Establishing a mutual climate of trust is important in fostering learning.
- Provide nonjudgmental understanding of adult learners’ perspectives. Respond with empathy to both their intellectual and emotional perspectives. Remember that people are more open to learning when they are respected and feel supported rather than when they feel judged or threatened.
- Establish a climate for learning. Openness and authenticity are essential. People will be more likely to examine and embrace new ideas in an open and authentic environment.

loss for words, and quiet. Although he or she may know the material and have much to offer, the individual’s shyness, fear, or lack of confidence may keep him or her from participating in class activities or answering questions. You can engage this student by asking nonthreatening questions and offering encouragement. You need to let a hesitator know that his or her contributions are worthwhile and important. Every student’s participation in the classroom is important, so provide reassurance to this type of student as necessary.

The student who is bored or quiet may be displaying that behavior because of a particular circumstance. Sources of this problem may include a lack of interest in the subject, an objection to being forced to be in the class, unfamiliarity with the terminology in the class, boredom, and long and technical lectures. This student may just drift off mentally and refuse to participate in the classroom or become disruptive in other ways (see Chapter 3). As the fire service instructor, you need to keep all students interested and focused on the material, so keep your lectures interactive and concise.

Other students may not be interested in the topic. They may be in the class simply because they have to be. These students lack energy and attention, and you should try to determine whether this is a regular problem. If so, these stu-

dents may have a disability or other problem that you may need to discover and address through counseling, tutoring, or other means.

A student who is a slow learner may be the most difficult for you to deal with. Such an individual has trouble keeping up and may not understand some or all of the material. One technique for handling this situation is to encourage input from other students—hearing the information differently may help. During a break, have a respectful one-on-one talk with the student to ensure understanding and comprehension.

Many students have some kind of impediment to learning, and most of those students have found unique ways to compensate for these obstacles. We all have times when our attention drifts or our energy is low, but if it is a reoccurring event it needs to be addressed because it will interfere with long-term learning. Some students may need help in the form of tutoring or individualized instruction, for example. These options should be discussed with students who have learning disabilities, and together you and the student should design a learning plan.

Wrap-Up

■ Chief Concepts

- In the education and training environment, you need ways of identifying what is helping the students to learn and what is not. What works for one student may not necessarily work for another.
- It is your responsibility to understand what learning is, which principles are associated with learning, how students learn, and how learning affects student behaviors.
- Teaching or instruction is the single greatest determinant of learning. The more you know about learning, learning styles, your students, and teaching methods and strategies, the more effectively you can influence student learning.
- Your effectiveness depends on being organized; communicating the goals, objectives, and expectations of the program clearly; and knowing the audience or group of students.
- Having an understanding of the learning process can help you to improve and continue to hone your instructional skills. It is helpful for students to understand the basics of learning theory, so that they will know what could potentially interfere with their own learning.
- Having an understanding of scientific research related to adult learners will help you become a better instructor and assist you in helping your students to learn.

■ Hot Terms

Affective domain The domain of learning that affects attitudes, emotions, or values. It may be associated with a student's perspective or belief being changed as a result of training in this domain.

Attention-deficit/hyperactivity disorder (ADHD) A disorder in which a person has a chronic level of inattention and an impulsive hyperactivity that affects daily functions.

Behaviorist perspective The theory that learning is a relatively permanent change in behavior that arises from experience.

Bloom's taxonomy A classification of the different objectives and skills that educators set for students (learning objectives).

Cognitive domain The domain of learning that effects a change in knowledge. It is most often associated with learning new information.

Cognitive perspective An intellectual process by which experience contributes to relatively permanent changes (learning). It may be associated by learning by experience.

Competency-based learning Learning that is intended to create or improve professional competencies.

Dyscalculia A learning disability in which students have difficulty with math and related subjects.

Dysphasia A learning disability in which students lack the ability to write, spell, or place words together to complete a sentence.

Dyspraxia Lack of physical coordination with motor skills.

Kinesthetic learning Learning that is based on doing or experiencing the information that is being taught.

Learning A relatively permanent change in behavior potential that is traceable to experience and practice.

Learning domains Categories that describe how learning takes place—specifically, the cognitive, psychomotor, and affective domains.

Learning style The way in which the individual prefers to learn.

Psychomotor domain The domain of learning that requires the physical use of knowledge. It represents the ability to physically manipulate an object or move the body to accomplish a task or use a skill. This domain is most often associated with hands-on training or drills.

VARK Preferences A tool that measures a person's learning preferences along visual, aural, read/write, and kinesthetic sensory modalities.

Visual, auditory, and kinesthetic (VAK) characteristics Learning styles based on the idea that we all have a learning style preference based on sensory intake of information (visual, auditory, and kinesthetic).

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Fire Service Instructor *in Action*



As the fire service instructor, you have been assigned to the training center. For the next several weeks, you will be teaching a skills recertification class. As you begin to plan your instruction materials, you think about the diverse group of people who will be in the classroom and wonder how the information you will be presenting can best be shared with them.

1. Which of the following questions would help you prepare for this class?
 - A. On which day of the week will the class be given?
 - B. What shifts are the students from?
 - C. Which type of learning or relearning will be going on?
 - D. What time will lunch be?
2. How should the information be presented to the students?
 - A. You should present the information in the way that you prefer to learn.
 - B. You should pick one way to present the information and stick with it throughout the course.
 - C. It doesn't matter how the information is presented.
 - D. You should provide critical thinking opportunities that appeal to a variety of student learning styles and preferences.
3. What is the purpose of evaluating students' skills performance?
 - A. Provide students with feedback that will help them master the skill.
 - B. Give students the opportunity to get a passing grade.
 - C. Provide an exercise to fill up the allotted class time.
 - D. Give students the opportunity to show how good they are.
4. Which of the following outcomes demonstrates that learning occurred?
 - A. The student passes a written exam.
 - B. The student passes a practical exam.
 - C. The student correctly answers questions that he or she could not answer prior to the class.
 - D. The student answers all of the answers on the exam correctly.
5. If you give the VARK Preferences questionnaire at the beginning of the class, you will be able to determine:
 - A. whether learning has occurred.
 - B. what the preferred learning styles of the students are.
 - C. how effective your teaching style will be.
 - D. how effective your teaching style was for the students.
6. According to Bloom, changes in attitudes would occur in the _____ learning domain.
 - A. affective
 - B. psychomotor
 - C. cognitive
 - D. behavioral
7. According to the behaviorist, perspective changes in behavior occurs due to:
 - A. teaching.
 - B. intellectual process.
 - C. experience.
 - D. conscious thought.
8. If you want to reach the greatest number of styles of learning, you should include material that:
 - A. is delivered in the form of a lecture.
 - B. is delivered in the form of a lecture and the students take notes.
 - C. a student can see, hear, and touch.
 - D. a student can hear, see, touch, smell, and taste.