TWO

Effective Learning Systems

■ INSTRUCTIONAL GOALS

Upon completion of this chapter and the nurse educator learning experiences, the learner will be able to:

- Critique learning objectives using Bloom's taxonomy
- Apply Mager's instructional objectives theory to written examples
- Demonstrate Gagne's nine instructional events
- Apply Bandura's cognitive learning theory
- Write a definition of a learning system
- Devise written evaluation procedures
- Demonstrate sequencing of learning content
- Choose active learning teaching methods from a list of strategies
- Discuss learning system problems with a group of learners
- List essential aspects of learning contracts
- Verbalize the difference between a curriculum and a learning system

Upon completion of this chapter, the more advanced nurse educator will be able to:

- Model a procedure for classmates or nursing learners and use Bandura's social cognitive principles to evaluate her performance and identify teaching or research implications
- Devise a table comparing Gagne's conditions of instruction with Bloom's taxonomy and give examples of each that are pertinent to teaching nurse learners
- Teach three novice nurse educators how to construct behavioral objectives using Bloom's taxonomy and Mager's goal theory
- Build a curriculum for a nursing program starting with the course objectives and content by level and matching them to school, college, or program goals
- Design a research problem statement with motivation of learners as the theme

Key Terms

Affective learning domain
Bandura's social cognitive theory
Behavioral objectives
Cognitive domain
Criterion-referenced grading
Curriculum
Deductive learning
Discovery method
Disputation method
Educator/learner contract
Evidence-based learning
Fidelity
Generation X & Y learners
Inductive learning
Learning systems
Lesson plans
Motivation
Post-test
Pretests
Preview method
Problem solving
Productive & reproductive learning
Prompts
Psychomotor domain
Purpose of instruction
Reliability
Taxonomy
Validity

Introduction

Learning occurs when effective learning systems are in place. This chapter provides theory and specific ideas to help nurse educators design, implement, and evaluate effective learning systems and shows how learning systems relate to a nursing curriculum and learning objectives. Specific topics covered include: formulating learning objectives based on Bloom's taxonomy, using Gagne's conditions of learning theory to insure effective learning, examining examples of Bandura's cognitive learning and self-efficacy theory, considering Mager's goal theory, sequencing content, timing the presentation of material, dealing with environmental restraints, identifying and changing ineffective learning systems, developing learning contracts, evaluating learning, and aspects of evidence-based learning.

Designing Effective Learning Systems

Designing effective **learning systems** requires knowledge of learning, learning theory, learning systems, and the learner. It also includes skills in writing behavioral objectives and learning contracts, and building a curriculum. A beginning question for nurse educators who hope to develop effective learning systems is, "What kinds of learning are there?" There are four basic types of learning systems, which include:

1. trial and error
2. deductive and inductive approaches
3. discovery
4. social cognitive learning.

Trial and Error Learning

The least efficient way to learn is through trial and error learning, trying one approach and then another, with no guiding theory or principles. This is like reinventing the wheel every time the learner wants to progress.

Deductive Learning

Giving a definition and following it with examples is the **deductive** approach to learning. An example of deductive learning is giving a definition of anxiety and then following it up with examples of anxiety.

Deductive learning includes giving a definition first and then providing examples.

Inductive Learning

The opposite process to deductive learning is **inductive learning**. Giving examples of a concept and then following it with a definition or assisting learners to formulate the definition is the inductive approach. When learners are asked to "discover" the definition, the **discovery method** of learning is used, a type of inductive learning. When using this approach, it is imperative that examples of a concept are clear and demonstrate only one characteristic difference. It is also useful to provide examples of situations that do not fit the concept (nonexamples). Examples and nonexamples must be plentiful, and the instructor must be vigilant so learners do not formulate the wrong definition. To monitor movements toward a wrong definition, provide counterexamples. For example, a learner might make the false discovery that crises are unexpected events if no examples of developmental crises are available.

Inductive learning includes giving examples of a concept and then following it with a definition.

The discovery method of learning includes asking learners to discover the definition by being presented with examples and nonexamples of a concept.

In addition to examples and nonexamples being presented to learners, preview and advanced practice can be used to assure concept learning. When using the **preview method,** learners are given time to inspect materials or equipment, to read related articles, to view films, or to participate in a mini-exercise or simulation that depicts the concept. All preview materials should underline the important aspects of the examples in order to focus the learners' attention on these. Once learners are able to discriminate between simple examples and nonexamples, more complex examples are used, with properties that are not easily identified and with many properties included in the definition. Examples may differ on more than one property, and there should be no prompts or cues to the learner to attend to aspects of the examples (Diamond, 1998; Davis, 1974).

In the preview method, learners inspect materials or equipment, and participate in mini-exercises or simulations that depict the concept.

Social Cognitive Learning

Bandura (1977, 1986, 1997, 2001) developed a **social cognitive theory** that has been widely used and accepted (Graham & Weiner, 1996). Bandura wrote that indi-

viduals possess self-beliefs that can enable them to exercise control over their thoughts, feelings, and actions.

Self-efficacy, or the belief in one's ability to perform adequately, has proven to be a more consistent predictor of behavioral outcomes than other motivational constructs (Graham & Weiner, 1996). Learners with high self-efficacy expect higher grades and put forth the effort to get them. They approach difficult tasks as challenges rather than as situations to be avoided. Certain environmental characteristics can result in even highly self-efficacious and well-skilled learners choosing not to behave in concert with their beliefs and abilities if they:

- Lack the incentive
- Lack the necessary resources
- Perceive social constraints

Bandura wrote that learning would be laborious and hazardous if learners had to rely on only themselves (1977). Luckily, learners have educators to model appropriate behavior for them. This vicarious learning permits individuals to learn novel behaviors without going through the arduous task of trial and error learning.

Bandura emphasized the importance of modeling behaviors, attitudes, and emotional reactions (1977). He believed that it was the human capability to symbolize that allowed learners to:

- Extract meaning from the environment
- Construct guides for action
- Solve problems cognitively
- Support well thought-out courses of action
- Gain new knowledge by reflective thought
- Communicate with others at any distance in time and space
- Use self-reflection to make sense of their experiences, and
- Engage in self-evaluation and alter their thinking and behavior accordingly (Bandura, 1986).

■ Nurse Educator Challenge

Based on what you know about Bandura's theory, what is the role of the educator in relation to learners?

Social Cognitive Theory Principles

Principles of Bandura's theory include:

1. The highest level of observation learning is achieved by first organizing and rehearsing the modeled behavior symbolically and then enacting it overtly.
2. Coding modeled behavior into words, labels, or images results in better retention of information than does simply observing.
3. Individuals are more likely to adopt a modeled behavior if it results in outcomes they value, if the role model has admired status, and if the behavior has functional value.
4. Self-efficacy beliefs are paramount; level of motivation, affective states, and actions are based more on what learners believe than on what is objectively true.

Jason, a seasoned nurse educator, had been using Bandura's social learning theory for many years. Just recently, he'd been experimenting with several of the principles from Bandura's theory. Jason set up a role playing situation he wanted to use in class. He planned to ask participants to wear signs around their necks indicating the main concept they were portraying.

■ **Nurse Educator Challenge**

Which of Bandura's principles was Jason demonstrating?

Implications of Bandura's Social Cognitive Theory

The implications of Bandura's social cognitive theory are that nurse educators take care to role model positive behaviors, attitudes, and emotional reactions when teaching learners. Nurse educators must also provide a learning environment that allows learners to extract meaning from it and use social persuasion based on attainable success to help learners create and develop high self-efficacy beliefs. Other implications of Bandura's social cognitive theory are that nurse educators must remove real or imagined social or resource constraints to increase incentives to produce competent performances, help learners use self-reflection and self-evaluation to alter their thinking and behavior toward high self-efficacy, and provide learning incentives and adequate resources, as well as remove social constraints.

Devon, a seasoned nurse educator, planned to role model the most effective way to obtain an intake interview, allow learners to practice small segments of the interview process, and ask them to evaluate their learning experience in a journal.

■ **Nurse Educator Challenge**

Which of Bandura's principles did Devon overlook and how would you supply them?

Learning Systems

A **learning system** is an interdependent combination of people, media, and materials that interact to achieve a goal. In the systems approach to instruction, the teaching/learning process is planned to facilitate learning. A specific methodology is used to design, implement, and evaluate the teaching/learning process. This methodology is directed at achieving specified objectives and is based on research in human learning and communication (Diamond, 1998; Davis, 1993).

A learning system is an interdependent combination of people, media, and materials that work together to achieve a goal.

Alexander, a new nurse educator, wasn't sure what kind of teaching/ learning activity to plan for his first classroom experience. After planning first a role playing situation and then a case study, he finally decided to keep it simple. He asked the learners to read an article and report back on their findings.

■ **Nurse Educator Challenge**

What evidence is there that Alexander provided a learning system? Give a rationale for your answer.

The minimum requirements for a learning system consist of:

- A learner
- A learning goal
- A procedure for achieving the goal

By this definition, self-paced or individualized materials, programmed instructional materials, and small-group exercises used by learners according to specified instructions are learning systems. A learning system need not include an educator except in its design. Some learning systems do include visibly present educators or

facilitators. A group of learners who have been given a learning goal and then receive a lecture compose one type of learning system. Many learning systems added together constitute a curriculum.

In the past, memorization of predigested amounts of information was sufficient. Now, process goals such as creativity, inquiry, and inductive thinking require that objectives be tied to the curriculum, teaching/learning strategies, and learner needs (Kizlik, 2006; Joyce and Weil, 2004).

Choosing Teaching/Learning Methods

The choice of teaching method is dependent on educator style and repertoire of skills, learner preferences and learning needs, and the qualities or teaching effectiveness of the available methods. The skill repertoire of the nurse educator can be increased by studying and using the methods that appear in the remaining chapters in this book. Learner preferences can be assessed using Box 1–3 in Chapter 1. Learning needs can be assessed by devising a written, verbal, or action pretest.

Fidelity is the quality associated with practicing in a realistic setting that is similar to the real-life situation.

There are some guidelines based on learning method qualities that can help to select the teaching method of choice. The more realistic the practice component of the teaching method, the more likely the learner will be to apply learning in the referent situation. This quality is called **fidelity**.

Sonya, a nurse educator, selected two learning methods that were of equal fidelity. She knew she wouldn't have time to use both in one class and wasn't sure what to do.

■ Nurse Educator Challenge

What should Sonya do? Give a rationale for your answer.

When methods are equal in effect, the least expensive should be used. This is the *quality of cost*. If methods are equal in effect and cost, the safest one should be utilized. This is the *quality of safety*, and it can apply to safety for the client or the learner. Safety for the learner includes practice that will not unduly expose the learner to negative learning experiences.

When methods are equal on all qualities, use the one that provides practice experiences not readily available in the real world. This is the *quality of completeness* (Davis, 1993; Davis, 1974). Box 2–1 compares the methods presented in later chapters by their qualities.

It is possible to modify qualities of some methods. For example, by only using videotape with small, cohesive groups of learners, they can be protected from unnecessary exposure of their lack of skill or of their thoughts and feelings. Likewise, if nurse educators are skilled in developing their own inexpensive simulations, simulation games, self-paced materials, and programmed instructional materials and in operating their own audio- and videotape or videoconferencing equipment, cost may be decreased. Subsequent chapters assist nurse educators to develop their own teaching materials.

Box 2–1 Comparison of Learning Methods and Their Qualities

	Quality			
Method	**Fidelity**	**Cost**	**Safety**	**Completeness**
Simulations, simulation games	Excellent	Inexpensive to expensive	Safe	Incomplete
Peer supervision	Moderate to good	Inexpensive	Possibly unsafe	Quite complete
Self-paced materials	Moderate to good	Inexpensive to expensive	Safe	Complete
Video and audiotape	Moderate to good	Expensive	Possibly unsafe	Complete
Perceptual exercises, journal writing, value clarification	?	Inexpensive	Safe	Complete
Programmed instruction	Moderate	Inexpensive to expensive	Safe	Complete
Small groups	Moderate	Inexpensive	Possibly unsafe	Complete

Teaching/learning methods are chosen based on the purpose of instruction.

In addition to the qualities of fidelity, cost, safety, and completeness, the tips that follow can help in the selection of teaching/learning methods based on the **purpose of instruction**.

1. If objectives such as learning to learn and learner responsibility for learning are the focus, self-paced materials are appropriate.
2. If learning objectives include pre-practice in a safe environment and an integrated cognitive, affective, and perceptual-motor approach, simulations and simulation games are appropriate.
3. When immediate feedback and presentation of self to others are important, audio- and videotape and videoconferencing methods can be used.
4. When content can be broken down into small, sequential bits of knowledge and when learners learn individually, programmed materials are useful.
5. When learners are blocked from other learning, affective learning is important, and perceptual exercises, journal writing, and/or value clarification are effective when values, moral development, or ethics are the focus.
6. Peer supervision or small-group methods are helpful if input, collaboration with peers, and learning leadership qualities are essential learning objectives.

Learner-Centered Syllabus

According to Diamond (1998), a learner-centered syllabus can help:

- Define learner responsibilities and help manage time by providing a clearer idea of what is expected and a time frame for accomplishing it
- Improve learner note-taking and studying
- Reduce anxiety by providing sample test questions, readings that may be difficult to obtain, and important handouts
- Improve learner efficiency by including detailed descriptions of major assignments with sample expected responses

Possible content for a learner-centered syllabus includes:

1. Title and number of course
2. Letter of welcome to the learner describing the intent, purpose, and overall goal(s)
3. Table of contents
4. Purpose of the learner manual and how to use it

5. Introduction including how the course fits in the general program and for whom it was designed, general directions for learners, where notices, grades, and related items will be posted
6. Personnel involved in the course and how to contact them, office hours, and an e-mail address
7. Overview of the course, including course outline, module outline, options, and course objectives
8. Evaluation and grading procedures including credits, grading system, scales, or forms
9. Logistical forms including change option, notification form of faculty of problems with learning materials
10. Textbook(s) including where to get it, how to get it, and how to use it
11. Calendar that includes topics by class meeting, projects due, and deadlines
12. Facilities that will be used
13. Checklist for due date of assignments
14. Self-tests for learners to evaluate their ability to meet course objectives
15. Additional information on using the library and/or computing center
16. Online segments including description of how to log online to the course, how to contact the school or university's Help Desk, how to use the e-mail system, the nurse educator's email address, where to find online postings of the class syllabus and schedule, and any additional other information such as forums, online exams, etc.

Lesson Plans

In the traditional lecture approach, a **lesson plan** that contains sequential components is used. It contains the following phases:

A lesson plan contains sequential learning components.

1. *Motivation*—a specified period of time is spent or materials are used to evoke learner interest in the topic.
2. *Aim*—a specified period of time is spent in activities to help learners focus on learning objectives and formulate a problem or question.
3. *Development*—a specified period of time is spent in lecture, demonstration, laboratory, audiovisual experiences, or discussions to permit learners to learn cognitive, affective, or perceptual-motor skills.

4. *Pivotal questions*—a specified period of time is spent or materials are used to draw out ideas, detect learning difficulties, and move the interaction forward. Questions are used to help learners recall material presented to date and to tie past learning to new material. Acquisition and coding are enhanced by this process.
5. *Summary and evaluation*—a specified period of time is spent (and materials may be used) to summarize and evaluate what has been presented.
6. *Assignment*—a specified period of time is spent (and materials may be used) to prepare learners for accompanying work or the next class period. Assignments that enhance transfer and provide for practice or review will promote retention of material.
7. *Additional items*—a specified period of time is spent in assisting learners to work through learning problems with the teacher, report on related events, or share learning experiences with peers. Effective learning can be enhanced and resistances to learning and sharing can be decreased in this period.

The amount of time spent on each of the seven categories will vary by nurse educator, content, and learner population.

Timing Presentation of Materials

Timing of learning materials is an important issue for the nurse educator. If the method chosen to present material is lecture (or a modified version), the issue of timing is often resolved through the use of a lesson plan. When self-paced materials are used, learners time their own work. Whenever classroom time is used for learning, the educator must consider how to use the time to best advantage. Lesson plans are one way to do this.

Jim, a nurse educator, was planning a class period. He tried to make sure he divided the time between all seven categories. When he thought about class, it soon became clear he'd made a mistake in his planning. He decided to forget about his lesson plan and wing it. He dumped his learning plan into the waste receptacle.

■ Nurse Educator Challenge

Do you agree with Jim's action? Give a rationale for your answer.

Novice nurse educators tend to disregard classroom plans and even whole learning systems when there are indicants that the plans or systems are ineffective

in some way. Prior to discarding any plan or learning system, an evaluation of each part of the system should be made, including use of learning theory, presentation of content, structure of materials, and evaluation and sequencing difficulties.

In addition to assessing what was wrong with a class period or learning system, it is important to identify what was right or useful and to make written comments on both aspects. This will assist in obtaining a more objective and balanced view of classroom work. It can also serve as a goal to work toward as well as a reward for having achieved some success. The Nurse Educator Tip that follows provides a way to evaluate lesson plans.

Nurse Educator Tips

Evaluate Your Lesson Plans

To evaluate your lesson plans, ask:

- Was motivation lacking or ineffective?
- Were learners effectively assisted in focusing on the chosen topic?
- Was the wrong method used to develop the topic?
- Were questions unclear, always directed to the same learners, or irrelevant?
- Was insufficient time allotted to accomplishing the objectives?
- Were activity directions unclear?
- Were learners observing, rather than being actively involved?
- Were there difficulties with equipment or materials?
- Was the summary omitted, too brief, or unprofitable?
- Was the assignment inadequately covered?
- Was insufficient time allotted for emerging teaching or learning problems or for feedback and sharing among learners?

Learning Contracts

Educator/learner contracts can be educator or learner assigned or made.

The design of a learning system will be influenced by the quantity of educator and learner input. A major issue in instructional procedures is the **educator/learner contract**.

There are a number of basic contracts including:

- *The educator-made and educator-assigned contract*—in this kind of contract, the teacher makes all the decisions concerning the content and sequence of learning activities. This contract is most commonly used in individualized instruction approaches.
- *The educator-made and learner-assigned contract*—learners are able to select a contract based on their own choices and preferences. The educator prepares a number of contracts, and learners choose those that appeal to them.
- *The learner-made and learner-assigned contract*—this contract is based on areas identified by learners as those where they have interest or are academically weak. Once learners begin to learn to assess their own instructional needs and special areas of interest or nursing specialty, such a contract has implied objectives and potential for learning to learn and lifelong learning.

The jointly written contract is developed between educator and learner during a series of meetings. The content of the contract and the procedures surrounding it are discussed and forged through discussion. This type of contract has potential for teaching cooperative and collaborative skills, for working through two-person teaching/learning difficulties, and for developing mentor or sponsor relationships where educators and learners are on a more equal basis than in traditional learning situations. A learning contract of this type includes:

- An initial description of the learner's work,
- The specific goals, purposes, and time frame for the work,
- A description of learning activities and resources, and
- The evaluation criteria to be used to evaluate attainment of learning goals.

Nurse educators who use this method have a special opportunity to assist learners in developing and maximizing their own unique abilities and their own learning styles. When learner input and independence is great, they cannot help but influence the ability to function as an independent practitioner in referent situations.

How can independent learners be educated in traditional classrooms when the educator makes all relevant decisions and learners are passive and dependent? Box 2–2 shows a sample written collaborative contract for a course in group dynamics.

Box 2–2 Sample Nurse Educator/Learner Collaborative Contract

Collaborative nurse educator/learner contract between:
Sylvia Tyrone and Carolyn Chambers Clark

Course: Group Dynamics

A. **My goals:** I hope to work in pediatrics and I would like to become skilled in group work with children.

B. **Group skills I have**: I have taught church school and Girl Scouts for three years. I participated in a sensitivity group for a weekend marathon.

C. **Group skills I need:** I need to develop ways of directing the movement of a group more effectively. I tend to sit back and let the group lead itself. I need to read on the subject of group theories and practice applying them with (simulated) groups.

D. **To help improve my group skills, I plan to do the following:**
   1. Survey the literature and (with assistance from the instructor) choose appropriate readings.
   2. Lead a group of hospitalized children for eight sessions.
   3. Participate in group simulations and videotape replay of my participation in these simulations as pre-practice for actual group leadership.
   4. Complete the programmed instructional unit on recording in groups.
   5. Complete three recordings of group sessions to criterion.
   6. Present excerpts of three process recordings to the instructor verbally, using the brief presentation form to evaluate my work.
   7. Present excerpts of three group process recordings to a peer verbally, using the brief presentation form to evaluate my work and obtain feedback from the student.

Building a Curriculum

Jessie, a PhD nursing education learner, plans to develop a nursing curriculum as one of her requirements to obtain her degree. She has no idea where to start and when she does an Internet search, she doesn't find much information. Because their school recently revised its curriculum, Jessie decides to interview

several nursing educators and find out more about how to develop a curriculum. Here's what she discovered.

A **curriculum** is an educational program designed to meet specified goals. The nursing curriculum is an example. It consists of all the content and teaching approaches used to meet identified goals (learning systems).

A curriculum includes all the content and teaching approaches used to meet program learning goals.

A nursing curriculum flows from a philosophy of nursing education. Major concepts are threaded throughout courses. Examples of major concepts are:

- Evidence-based practice
- Informatics/communication
- Interdisciplinary teams
- Client-centered care
- Mind-body-spirit (holism)
- Learner centered environments

Organizing frameworks for curricula include:

- NLN competencies, such as provider of care and manager of care.
- NCSBN Core Competencies, such as professional behaviors, communication, assessment, clinical decision making, caring interventions, teaching and learning, or collaboration.
- NCLEX Test Plan, including safe, effective care environment, health promotion and maintenance, psychosocial integrity, physiological integrity, functional health patterns, and systems.
- The American Holistic Nursing Association (AHNA) standards, theories, and concepts including nurses as models of wellness, promoting client self-responsibility and self-care, the nurse as a healing environment, meaning and wholeness, and the holistic nursing process.

■ Nurse Educator Challenge

What framework should Jessie choose? Give a rationale for your position.

Building a curriculum is an interactive process. Educational outcomes or terminal objectives (what the learner will be able to do upon graduation) specify the curriculum

and relate back to major concepts identified in the philosophy. Level objectives or course objectives move the learner toward terminal objectives. Levels of a program demonstrate progression and provide the framework for clinical evaluation. The objectives for the final course are the same as the educational outcomes or terminal objectives.

> ■ **Nurse Educator Challenge**
>
> Develop three terminal objectives for the framework you chose.

Course objectives determine the content for each course, with the organizing framework providing structure for the content. Objectives should be achievable and reflect the philosophy of nursing. Because it is impossible to cover every topic, the challenge in designing a curriculum is to identify critical concepts.

> ■ **Nurse Educator Challenge**
>
> Study the curriculum and learning objectives for your school or college. Are there any concepts or objectives that could be deleted? Give a rationale for your decision.

When the curriculum is in harmony with teaching approaches, learning goals are met. A curriculum sketches the framework and broad design, while the teaching/learning process actualizes it (Joyce and Weil, 2004.)

Evidence-Based Learning

The most common method of teaching continues to be standing in front of the class and transmitting knowledge via lecture. This method often continues even though evidence shows that active, self-directed, problem-based learning (evidence-based learning) is more effective than traditional, lecture-based learning (Beers and Bowden, 2005; Hill et al., 1997; Jamrozik, 1996; Schwartz, Donnelly, Nash, and Young, 1992; Shin, Haynes, and Johnston, 1993; Schmidt, 1993; Patel, Groen, and Norman, 1991; Friedman, DeBliek, and Norman, 1990; Woodward, 1990), and better liked by learners.

Evidence-based learning means learning that is based on research findings.

Problem-based approaches can also be more effective than lecture in the areas of communication and self-directed learning, level of independence, and satisfaction

with the course (Rideout et al., 2002), effective performance (Smits et al., 2003), and in positive attitude toward course content (Pugsley and Clayton, 2003).

For learners to use new information, they need to structure, organize, and integrate the information with their previous knowledge. But there appears to be a disconnect between what faculty want to do—*cover content*—and what adult learners need and request—*active, problem-based learning* (Sharif and Masoumi, 2005; Candela, Dalley, and Benzel-Lindley, 2006).

Many nursing faculty believe they must cover content but what learners need to learn is usually covered in their textbooks or assigned readings. As Candela, Dalley and Benzel-Lindley (2006) remind nurse educators, teacher-centered education is no longer adequate to prepare today's learners to perform adequately in the complex health care system. Instead of asking, "What do I need to cover in class?" nurse educators need to ask, "What do learners need to and want to learn to feel equipped to function as a professional in clinical situations?"

Clinical Learning

One example of what learners need that may not be provided in many settings was made apparent in one study. The nursing learners in the study reported their dissatisfaction with the way they were prepared for their clinical experience. They described feeling incompetent and lacking professional nursing skills, and having a need to learn ways to handle their anxiety about performing while being evaluated (Candela et al., 2006).

■ **Nurse Educator Challenge**

If you were teaching the nurse learners in the Candela study, what would you do?

Age Differences in Learning

Learner needs may differ by age. For example, **Generation X learners** (born between 1965 and 1976) tend to:

- Be highly independent,
- Challenge authority frequently,
- Solve problems independently, and
- Multitask.

Generation Y learners (who began entering college in 2000) are:

- The most culturally diverse group of all time,
- Self-reliant,
- Questioning,
- Technologically advanced,
- Expecting others to earn respect, and
- Addicted to visual media.

Nurse educators must develop teaching methods that align with the expectations, values, and needs of these learners (Walker et al., 2006).

Generation X learners are highly independent, challenging, problem solving, multitasking.

Generation Y learners are culturally diverse, self-reliant, questioning, technologically advanced, expecting others to earn respect, and are addicted to visual media.

Health Care Shifts and Learning

In addition to learner needs, changes in the health care environment dictate a shift in nurse educator goals. With the shift from acute to chronic health care, and from curing to caring, lifestyle has become an essential component in health promotion (Stark, Manning-Walsh, and Vliem, 2005). Being a healing presence to clients requires that nurses learn to care for and nurture themselves (Burkhardt and Nagai-Jacobson, 2001).

Credentialing and Learning

One area of nursing that has not kept up with learning theory is credentialing and certifying examinations for practice. The questions on these exams are only weakly linked, if at all, to performance in clinical practice (Harden, Grant, Buckley and Hart, 1999). Teaching to exams and state boards in no way guarantees learners will be proficient in clinical care.

Active Learning Processes

What is a nurse educator to use to promote critical thinking and self-directed learning if lecturing is not the answer? Studies show that active learning procedures are more apt to promote critical thinking. Chapters 3-6 explore ways to design and use active learning systems that enhance critical thinking, including:

- Structured role play,
- Simulations and simulation games,

- Peer supervision,
- Self-paced learning materials,
- Programmed instructional materials,
- Audiovisual and computer methods of learning,
- Perceptual exercises,
- Journal writing, value clarification, small-group methods, and
- Other novel strategies that work well even with large classes.

No matter what type of learning system is being developed, behavioral objectives are crucial.

Behavioral Objectives

Behavioral objectives are statements of what learners are to be like when they have successfully attained the criterion. Behavioral objectives are tied to criteria, tests, and other measures of successful achievement in a course. Since it is impossible to look inside a learner's head and know if they understand a concept, nurse educators depend on objectives that detail observed behaviors. Without clear behaviorally-defined objectives that are shared by nurse educator and learner, measures of achievement can be misleading, irrelevant, unfair or useless.

Behavioral objectives are statements of what learners are to be like when they've attained the criterion.

Learning objectives spell out expected learning outcomes, but they are not a substitute for a philosophy of instruction or for expertise in teaching/learning methods. Learning objectives are not course descriptions or lists of what the teacher hopes to accomplish in the course, but precise ways of stating instructional goals (Kizlik, 2006).

Taxonomies of Learning Objectives

Just as nursing philosophy guides curriculum, learning objectives guide the development of a learning system. A Committee of Colleges led by Bloom, Englehart, Furst, Hill, and Krathwohl developed a taxonomy of cognitive or thinking objectives in 1956. These objectives were revised by Anderson and Krathwohl in 2001. Bloom's taxonomy continues to be one of the most universally applied models. Simpson (1972) developed the psychomotor taxonomy for manual skills. Later, Krathwohl, Bloom, and Bertram (1973) developed the education objectives for the affective (feeling, valuing) domain.

A **taxonomy** is an orderly classification. In this case, Bloom and associates classified thinking skills into learning objectives. They appear in six levels, from the most basic (remembering, understanding, and applying) to the higher order levels of thinking (analyzing, evaluating, and creating). At the graduate level, most learning objectives are usually developed at the higher levels of thinking. The purpose of writing behavioral objectives is to define what is to be mastered by the end of a course. Using detailed objectives will help learners understand the purpose of each classroom activity by clarifying the learning outcome. It is best to avoid using verbs that do not define an explicit performance, such as know, appreciate, internalize, and value (Mager, 1997).

A taxonomy is an orderly classification.

Websites Using or Explaining Bloom's Taxonomy

Stella, a new nurse educator, was planning a new community education course on family health. She went online to some of the Bloom Web sites including:

http://rite.edu.qut.edu.au/oz-teachernet/training/bloom.html
http://www.tedi.uq.edu.au/Assess/Assessment/bloomtax.html
http://www.officeport.com/edu/blooms.htm
http://www.utexas.edu/learner/utic/handouts/1414.html
http://www.coun.uvic.ca/learn/program/hndouts/bloom.html
http://www.kent/wednet.edu/KSD/MA/resources/blooms/teachers_blooms.html
http://eduscarpes.com/tap/topic69.htm
http://coe/sdsu.edu/eet/articles/bloomrev/index.htm

Once Stella had a basic understanding of Bloom's objectives, she created the cognitive objectives listed in the next section.

Cognitive Behavioral Learning Objectives

The **cognitive domain** involves knowledge and the development of intellectual skills. This includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills. There are six major categories that are listed in order below, starting from the simplest behavior to the most complex. The categories can be thought of as degrees of difficulties. The first level of the hierarchy must be mastered before the next level can take place (Clark, 2001). Sample learning objectives for each of Bloom's six categories of cognitive behavioral learning objectives follow.

The cognitive domain focuses on knowledge, including recall or recognition of specific facts, procedures, and concepts.

Cognitive Domain: Remembering

Remembering is the most easily attained level of cognitive learning objectives. Some verbs to use when developing learning objectives include recalling information, recognizing, listing, describing, quoting, naming, and finding (Anderson and Krathwohl, 2001). Some examples of cognitive behavioral learning objectives Stella wrote at the lowest level of Bloom's taxonomy, remembering, are:

1. **List** three cardinal rules for teaching relaxation procedures.
2. **Describe** the anatomy and physiology of the heart.
3. **Name** four side-effects of SSRIs.

■ **Nurse Educator Challenge**

How well did Stella meet Bloom's criteria for remembering? Provide a rationale for your answer.

Cognitive Domain: Understanding

Understanding is the next category on Bloom's hierarchy. Understanding includes explaining ideas or concepts. Key words to use to develop objectives include interpreting, summarizing, paraphrasing, exemplifying, classifying, and comparing (Anderson & Krathwohl, 2001). Some examples of cognitive behavioral learning objectives Stella wrote for understanding are:

1. **Explain** the importance of stress theory to clients in three clinical situations.
2. **Paraphrase** Orem's theory of self-care using your own words.
3. **Compare** Gagne's Conditions of Instruction with Bloom's taxonomy

■ **Nurse Educator Challenge**

How well did Stella meet Bloom's criteria for understanding? Provide a rationale for your answer.

Cognitive Domain: Applying

Applying is the last of the simpler cognitive behavioral objective categories. Applying is the ability to use information gained in another familiar situation. Key words to use to develop objectives include implementing, carrying out, using, and executing (Anderson & Krathwohl, 2001). Some examples of cognitive behavioral learning objectives for applying Stella composed are:

1. **Apply** the steps of the diagnostic conclusions handout to draw diagnostic conclusions from a given case history.
2. **Implement** a plan of care for a specified client using assessment data from an intake interview, lab findings, and observations of the client.
3. **Use** information you gained from participating in the ICU simulation game in your clinical practice in the ICU tomorrow.

■ **Nurse Educator Challenge**

How well did Stella meet Bloom's criteria for applying? Provide a rationale for your answer.

Cognitive Domain: Analyzing

Analyzing is the first step up the ladder to more difficult cognitive tasks. Analyzing includes breaking information into parts. Key words to use to develop objectives include exploring relationships, organizing, deconstructing, questioning, and defending (Anderson & Krathwohl, 2001). Sample analyzing behavioral objectives Stella created are:

1. **Organize** a class presentation in a logical and understandable fashion.
2. **Analyze** the group dynamics that took place in class this semester.
3. **Defend** research findings.

■ **Nurse Educator Challenge**

How well did Stella meet the criteria for analyzing? Provide a rationale for your answer.

Cognitive Domain: Evaluating

Evaluating is the second to the most difficult cognitive task. Evaluating includes justifying a decision or a course of action. Key words to use to develop objectives include checking, hypothesizing, critiquing, experimenting, and judging (Anderson & Krathwohl, 2001). Some examples of evaluating objectives Stella wrote are:

1. **Hypothesize** about the meaning of class behavior during the role playing situation.
2. **Critique** your thinking strategies this semester by keeping a journal of events.
3. **Experiment** with assertiveness approaches with three people this week.

■ **Nurse Educator Challenge**

How well did Stella meet Bloom's criteria for evaluating? Provide a rationale for your answer.

Cognitive Domain: Creating

Creating includes generating new ideas, products, or ways of viewing things. Key words to use to develop objectives include designing, constructing, planning, producing, inventing (Anderson & Krathwohl, 2001). Sample learning objectives Stella devised were:

1. **Plan** a role playing situation demonstrating a communication problem you encountered.
2. **Invent** a way to teach a blind and mute person how to brush his teeth.
3. **Design** a way to reduce medication errors on one clinical unit.

■ **Nurse Educator Challenge**

How well did Stella meet Bloom's criteria for creating? Provide a rationale for your answer.

Major Cognitive Knowledge Dimensions

Bloom's revised taxonomy also provides information on types of knowledge, including:

- *Factual knowledge*—professional terminology and specific details, such as the normal anatomy and physiology of body systems.
- *Conceptual knowledge*—knowledge of classifications and categories such as medications, herbs, and diets. Standard care procedures are also part of conceptual knowledge, and so is knowledge of theories, models, and structures, such as Orem's self-care theory, Gagne's instructional theory, and so forth.
- *Procedural knowledge*—includes information about how to do something, such as nursing procedures; criteria for using skills, such as nursing process; and criteria for using appropriate procedures, such as when to use a lab test, when to teach post-operative home care, and when to use relaxation procedures with clients.
- *Metacognitive knowledge*—includes thinking about your thinking, such as self-critiquing your abilities, or defending how you planned or executed care.

■ **Nurse Educator Challenge**

Which, if any, of the three types of knowledge are missing from the behavioral objectives Stella composed? Provide a rationale for your answer.

Developing Affective Learning Objectives

Bloom's **affective learning domain** focuses on the manner in which learners deal with situations. This domain targets feelings, values, appreciation, enthusiasm, motivations, and attitudes (Krathwohl, Bloom, & Bertram, 1973; Clark, 2001)

The affective learning domain targets feelings, values, appreciation, enthusiasm, motivations, and attitudes.

Jeff, a new nurse educator, was charged with developing affective learning objectives for a new course on self-care he planned to teach with two colleagues through the community outreach and adult education department at his university. One of his colleagues, a more seasoned nurse educator, pointed him toward the Internet for help in finding Krathwohl's, Bloom's, and Bertram's affective taxonomy handbook. Jeff found that affective objectives were classified in a hierarchy beginning with receiving phenomena, moving next to responding to phenomena, then to valuing, organizing values, and ending with internalizing values.

Affective Domain: Receiving Phenomena

Receiving phenomena includes awareness, willingness to hear, and selected attention. Key words to use to develop behavioral objectives include asks, chooses, describes, follows, gives, holds, identifies, locates, names, points to, selects, sits, erects, replies, and uses (Krathwohl, Bloom, and Bertram, 1973; Clark, 2001). Jeff wrote the following receiving phenomena affective behavioral objectives:

1. **Asks** questions that are focused on the topic.
2. **Listens** to others with respect and does not interrupt or look away.
3. **Sits** in a calm and open way, indicating receptiveness to others' comments.

■ **Nurse Educator Challenge**

Did Jeff meet Krathwohl's and Bloom's criteria? Provide a rationale for your answer.

Affective Domain: Responding to Phenomena

Responding to phenomena includes active participation in class and paying attention to particular phenomena. Key words to use to develop objectives include answers, assists, aids, cooperates, discusses, greets, helps, presents, reads, recites, reports, selects, tells, and writes (Krathwohl, Bloom, and Bertram, 1973; Clark, 2001). Learning outcomes emphasize active interest in responding, willingness to respond, or satisfaction in responding (motivation). Jeff wrote the following responding to phenomena affective behavioral objectives:

1. **Participates** in class discussions in a prepared manner.
2. **Questions** concepts, models, and procedures to understand them.
3. **Practices** ethical and empathic communication in class.

■ **Nurse Educator Challenge**

Did Jeff meet Krathwohl's, Bloom's, and Bertram's criteria? Provide a rationale for your answer.

Affective Domain: Valuing

Valuing is the worth or value attached to a particular object, phenomenon, or behavior. Valuing ranges from simple acceptance to the more complex state of commitment. Key words to use to develop objectives include completes, demonstrates, differentiates, explains, follows, forms, initiates, invites, joins, justifies, proposes, reads, reports, selects, shares, studies, and works. Valuing occurs when values are internalized, but clues to values are often expressed in learner overt behavior, and making them identifiable (Clark, 2001). Jeff created the following affective behavioral objectives:

1. **Proposes** a social plan to aid the community and follows through.
2. **Demonstrates** belief in ethical behavior.
3. **Informs** class about matters one feels strongly about.

■ **Nurse Educator Challenge**

How well did Jeff do with valuing objectives? Provide a rationale for your answer.

Affective Domain: Organizes Values

Organizes values into priorities by contrasting different values, resolving conflicts between them, and creating a unique value system. The emphasis at this level is on

comparing, relating, and synthesizing values. Key words to use to develop objectives include adheres, alters, arranges, combines, compares, completes, explains, defends, formulates, generalizes, integrates, modifies, orders, organizes, relates, and synthesizes (Clark, 2001). Jeff created the following affective behavioral objectives:

1. **Generalizes** new ethical standards to clinical practice.
2. **Defends** professional ethical standards by speaking up in class.
3. **Organizes** values into priorities through participating in a simulation.

■ **Nurse Educator Challenge**

Did Jeff's objectives meet the criteria for this level? Provide a rationale for your answer.

Affective Domain: Internalizing Values

Internalizing values includes having a value system that controls behavior and is pervasive, consistent, predictable, and characteristic of the learner. Key words to use to develop objectives include acts, discriminates, displays, influences, performs, practices, qualifies, revises, serves, solves, and verifies. Jeff constructed the following learning objectives:

1. **Practices** self-reliance when working independently.
2. **Displays** teamwork in group activities.
3. **Revises** judgments and changes behavior in light of new evidence.

■ **Nurse Educator Challenge**

Did Jeff meet the criteria for this level? Provide a rationale for your answer.

Psychomotor Domain

The **psychomotor domain** includes physical movement, coordination, and use of motor skills. Development of these skills requires practice and is measured by precision, procedures, or execution of techniques. Sometimes speed of performance is a factor, especially in life-threatening situations. The following seven major categories appear from the simplest behavior to the most complex behavior (Clark, 2001; Simpson, 1972).

The psychomotor domain includes physical movement, coordination, and use of motor skills.

Psychomotor Domain: Perception

Perception is the ability to use sensory cues to guide motor activity. Important processes include sensory stimulation, cue selection, and translation of messages. Key words to use to develop objectives include chooses, describes, detects, differentiates, distinguishes, identifies, isolates, relates, and selects.

> Daisy, a clinical lab instructor, was asked to revise the psychomotor behavioral objectives for learners who used the lab. She pulled out the notes she'd taken on the psychomotor domain in her master's program and went to work on the objectives.

The psychomotor objectives Daisy constructed appear below:

1. **Detects** nonverbal communication cues.
2. **Identifies** client anxiety.
3. **Estimates** correct body placement and force needed to complete an IM injection.

■ **Nurse Educator Challenge**

How did Daisy do? Do her behavioral objectives fit with perception criteria?

Psychomotor Domain: Readiness to Act

Readiness to act includes the mental, physical, and emotional sets necessary to perform. These three sets are dispositions that predetermine response to a situation. These dispositions are sometimes called "mindsets." Key words to use to develop behavioral objectives include begins, displays, explains, moves, proceeds, reacts, shows, states, and volunteers (Simpson, 1972; Clark, 2001). Daisy developed the following objectives for this category:

1. **Displays** correct equipment to perform a nursing procedure.
2. **States** correct side effects to medication before dispensing it.
3. **Explains** steps in a procedure prior to beginning.

■ **Nurse Educator Challenge**

Did Daisy meet the criteria for this level? Provide a rationale for your answer.

Psychomotor Domain: Guided Response

Guided response occurs in the early stage of learning a complex skills. Imitation and trial and error learning are prevalent. Adequacy of performance is achieved through practice. Key words to use to construct objectives for this domain include copies, traces, follows, reacts, reproduces, and responds (Simpson, 1972; Clark, 2001). Daisy developed the following psychomotor objectives:

1. **Performs** accurate treatment setups.
2. **Responds** to instructor hand-signals while learning to work with simulated client.
3. **Follows** simulation directions.

■ **Nurse Educator Challenge**

How well did Daisy meet the criteria for this level? Provide a rationale for your answer.

Psychomotor Domain: Mechanism

Mechanism is the intermediate stage in learning a complex skill. Learned responses have become habitual and the movements can be performed with some confidence and proficiency. Key terms to use to construct objectives for this domain include assembles, calibrates, constructs, dismantles, displays, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, organizes, and sketches (Simpson, 1972; Clark, 2001). Daisy constructed the following objectives for this domain:

1. **Organizes** Web site information
2. **Displays** statistical information
3. **Measures** liquid pediatric medication

■ **Nurse Educator Challenge**

How well did Daisy meet the criteria for mechanism? Provide a rationale for your answer.

Psychomotor Domain: Complex Overt Response

Complex overt response indicates the skilled performance of motor acts that involve complex movement patterns. Proficiency at this level is indicated by adjectives such as quick, accurate, and highly coordinated performance requiring a minimum of energy. This category includes performing without hesitation in an automatic manner.

Key words are the same as for mechanism, but adverbs or adjectives indicate a better, quicker, or more accurate performance (Simpson, 1972; Clark, 2001). Daisy constructed the following objectives for this level:

1. **Pours** medications quickly and accurately.
2. **Organizes** equipment for a procedure quickly and accurately.
3. **Displays** competence while communicating with a client.

■ **Nurse Educator Challenge**

How well did Daisy meet the criteria for this level? Provide a rationale for your answer.

Psychomotor Domain: Adaptation

Adaptation means skills are well developed and the individual can modify movement patterns to meet special requirements. Key words to use to formulate objectives are adapts, alters, changes, rearranges, reorganizes, revises, and varies (Simpson, 1972; Clark, 2001). Daisy developed the following objectives for the adaptation domain:

1. **Responds** effectively to ED crises.
2. **Modifies** nursing procedure to meet client needs.
3. **Revises** instruction to meet learner needs.

■ **Nurse Educator Challenge**

Did Daisy meet the criteria for adaptation objectives? Provide a rationale for your answer.

Psychomotor Domain: Origination

Origination involves creating new movement patterns to fit a specific situation or particular problem. When skills are highly developed, creativity is possible. Key words include arranges, builds, combines, composes, constructs, creates, designs, initiates, makes, and originates (Simpson, 1972; Clark, 2001). Daisy composed the following objectives for the origination level:

1. **Constructs** a theory.
2. **Develops** a teaching module.
3. **Creates** a new imagery protocol.

■ **Nurse Educator Challenge**

Did Daisy meet the criteria for the origination level?

Articles Citing the Use of Bloom's Taxonomy

A number of articles cite Bloom's taxonomy. Goldman and Torrisi-Steele (2004) used the taxonomy to design educational multimedia for an undergraduate learning system about child sexual abuse. Holcomb (2004) used Bloom's taxonomy to develop an online master's degree program in rehabilitation.

Xu, Carne, and Ryan (2002) applied Bloom's taxonomy when evaluating learning outcomes in an educational program for an underserved population. Shuldham (1993) used the taxonomy to guide the curriculum design of a masters program in cardio-respiratory nursing. Mikol (2005) reported using behavior, cognitive, and psychomotor objectives that coincide with simulated and clinical laboratories and class discussions in a nursing course taught without lecturing. Duan (2006) examined how to select and apply taxonomies for learning outcomes, using a nursing example.

Mager's Goal Theory

Mager (1997) took learning objectives a step farther. What Mager called instructional goals, Bloom and colleagues called a taxonomy for classifying learning outcomes. Mager specified objectives. Using his theory, useful learning objectives contain:

- An audience (the learner),
- A terminal behavior or performance (what the learner is expected to do),
- Test conditions under which the performance is to occur, and
- A criterion for success (how well the learner must perform to be acceptable).

■ **Nurse Educator Challenge**

Compare and contrast Bloom's taxonomy with Mager's theory of learning objectives.

Box 2–3 lists some terminal behaviors, test conditions, and performance standards.

Box 2–3 Learning Objective Components and Examples

Terminal behaviors	Test conditions	Performance standards
Label the circulatory system	Given a diagram of the circulatory system	Labeling nine of the numbers drawn on the diagram
Present a teaching session on the emotional aspects of diabetes	Given one hour of class time	Covering six of the seven aspects covered in class
Identify by underlining the side effects of tranquilizers	Given a written test and a time period of 20 minutes	Answering nine of ten questions correctly
List in writing the major theories of the etiology of depression	After viewing a film on depression	Completing quiz in 15 minutes after viewing film
Give a bedbath	Given a simulated client	Completing bedbath in 20 minutes, following all steps listed in procedure manual
State the feelings of a client	Given a simulated client	Completing a 15-minute interview using the Communication Skills Checklist
Conduct a group session with peers	Given a topic to cover	Ensuring all students speak at least once

Examples of Instructional Goals and Their Learning Objectives

Some examples of instructional goals and their learning objectives follow:

Instructional goal: For the learner to demonstrate empathy in a nurse/client interaction.

Learning objective: With a simulated client, the nursing learner will conduct an intake interview for 15 minutes, using level three empathy as defined by Carkhuff (1969).

Instructional goal: For the learner to teach pertinent skills to a client with diabetes.

Learning objective: With a simulated client, the nursing learner will conduct three 20-minute teaching sessions that include an assessment of what is known by the client about diabetes and its treatment and interventions to fill cognitive, affective, and/or perceptual-motor learning deficits as defined in class.

■ **Nurse Educator Challenge**

Delineate two instructional goals and their learning objectives.

Common Pitfalls to Writing Instructional Objectives

Novice nurse educators sometimes put two verbs in an instructional objective. This leads to a false performance, false givens, objectives focused on teaching strategies, gibberish, educator performance, and false criteria.

False Performances

Below are examples with a false performance in each one.

1. Have a thorough understanding of the anatomy of the hand.
2. Demonstrate a comprehension of the main arteries of the heart.
3. Be able to relate to clients with empathy.
4. Be able to understand special diets.

■ **Nurse Educator Challenge**

Revise the four false performances above to make them into objectives with an audience, performance, condition, and criterion.

False Givens

False givens describe the instructional process itself, not the specific conditions the learner must have or be denied when demonstrating achievement of an objective. Some examples of false givens are:

1. Given adequate practice, the nursing learner will be able to calculate dosage for three medications.

2. Given that the learner has completed Module 10, the learner will be able to interview three clients.
3. Given that the learner received an A for the previous course, the learner will be able to complete three IM injections.

■ **Nurse Educator Challenge**

Turn the false givens into specific objectives with an audience, performance, condition, and criterion.

Objectives Focused on Teaching Strategies

When objectives focus on teaching strategies, they can't be focused on the learner. Although this pitfall is similar to false givens, this statement describes a practice exercise, teaching point, or some other aspect of classroom activity. Describing a classroom activity is not constructing an objective. Some examples of focusing on teaching strategies include:

1. Be able to choose the right instruments for surgery.
2. Be able to choose a nursing procedure that illustrates a related point.
3. Be able to explain the case histories handed out in class.

■ **Nurse Educator Challenge**

Turn the three objectives focused on teaching points into useful objectives with an audience, behavior, condition and criterion.

Gibberish

Gibberish is the use of unclear and incomplete statements. Gibberish loses the reader in flowery terms and nonspecific phrases. Sometimes two verbs are used in an effort to be more thorough. Unfortunately, the result is an unclear objective that leads to unclear communication with learners. Examples of gibberish include:

1. Have a deep and increasing awareness and thorough professional grasp of nursing.
2. Demonstrate a thorough comprehension of bed baths.
3. Relate and encourage with multiple approaches the necessity of an immune system.

■ **Nurse Educator Challenge**

Turn the three gibberish statements into instructional objectives that would make Mager proud.

Educator Performance

An instructional objective describes learner, not educator performance. Avoid saying anything about educator behavior. Examples of objectives focused on educator performance and not learner behavior include:

1. The nurse educator will encourage an atmosphere promoting the development of security, confidence, and self-esteem in learners.
2. Show learners the proper procedures for designing a learning system.
3. Demonstrate the ability to role play with a learner.

■ **Nurse Educator Challenge**

Turn the three educator-centered statements into learner-centered objectives.

False Criteria

False criteria are unclear, insignificant, and incomplete. Often these statements are missing one or more of Mager's critical components. Three examples of false criteria include:

1. Must make 80% on a multiple choice exam.
2. Must pass a final exam.
3. Must complete a procedure to the satisfaction of the instructor.

■ **Nurse Educator Challenge**

Put on your thinking caps and revise these false criteria to describe the conditions under which the performance is to occur.

Overcoming Barriers to Writing Instructional Objectives

Writing instructional objectives is not always easy because some performances may not be visible and no single behavior (or type of behavior) may indicate the presence of the experience.

Ramona, a new nurse educator, was having difficulty writing instructional objectives for a course she planned to teach. She had tried Bloom's taxonomy, but wasn't satisfied with it. She felt something was missing. When a more experienced nurse educator told her another theory might work for her, she was glad to try it.

Mager's goal analysis theory (1997) can be used to objectify experiences that refer to attitudes and values. Mager suggests using the following four strategies to describe the goal to be attained.

1. Answer the question, "What will I take as evidence the goal has been achieved?"
2. Given all learners, what is the basis to be used to separate them into two groups: those who have achieved the goal and those who have not?
3. Imagine you are telling someone else how to judge whether learners have met the goal; what instructions would you give?
4. Think of people who have attained the goal; tell why you think they have attained it.

An example of a goal in the nursing classroom might be to participate effectively in group discussions. Some indicators that this goal has been met might be that learners:

- Allow speakers to finish presenting their views,
- Act to prevent others from interrupting speakers,
- Acknowledge information presented by others,
- Return discussion to the assigned topic or task, and
- State their own feelings without blaming others for their motivation or intent.

Covert Versus Overt Performances

Some verbs, such as identify or consider, refer to performances that cannot be observed. In this case, add an indicator behavior, such as write solutions, or circle, or point to, or another behavior you can observe the learner doing. Read the three objectives that follow and think of ways to make covert actions overt:

1. **Identify** the correct solution to a medication dosage.
2. **Identify** the correct answer to a client's question about overnight guests.
3. **Consider** the best way to assess a client's diabetes condition.

After mastering the writing of instructional objectives, the next step is applying a systematic approach to instructional design.

Implementing Learning Systems

Implementing learning systems includes teaching/learning principles, content sequencing, learning contracts, teaching methods, and giving feedback to learners,

Teaching/Learning Principles

Cognitive learning usually begins with the teaching of concepts that are generalized from particular instances. Examples of concepts include anxiety, conflict, frustration, empathy, responsibility, relationships, communication, roles, and competition. To teach concepts, give a definition or allow learners to develop an operational definition (all processes in order of their occurrence).

Concepts are combined to form principles. These principles specify relationships between events, leading to an ability to predict consequences, explain events, infer causes, control situations, and solve problems (Breslow, 2001; Davis, 1974).

Three phases must be experienced to learn a principle:

- Curiosity
- Identification of the principle, and
- Its application.

Curiosity

Some learners may ask questions that imply they are curious:

"Why did the client . . . ?"
"Why doesn't . . .?"
"How come . . . ?"

These questions can be used as a lever to introduce nursing principles such as family systems or death and dying principles. If no questions are forthcoming, the nurse educator can promote curiosity by making a provocative statement. Some examples are:

"Nurses cannot decrease client pain."
"Families cannot be changed by nursing intervention."
"There's nothing a nurse can do to help a dying client."

An alternate method is to ask a thought-provoking question. Some examples are:

"How can you apply what you learned about the teaching/learning process to your relationship with clients?"
"Can nursing care affect client anxiety?"

■ **Nurse Educator Challenge**

Think of two other provocative statements to use to promote learner curiosity.

Another method of enhancing curiosity is to demonstrate a relationship or event that reveals a new idea; for example, asking learners to predict what will happen to the use of other senses if a client becomes blind, then blindfolding them and asking for their observations.

Identify the principle

Once curiosity is aroused, learners are usually ready to identify the principle(s) involved.

Four approaches can be used.

1. **Ask learners questions until the principle is fully stated.**

Nurse Educator: What sensations did you notice while blindfolded?

Learner 1: I was scared to walk around.

Learner 2: I was much more aware of how I felt.

Learner 3: I didn't know where anyone else was at first.

Learner 4: I looked for other cues to where things were.

Nurse educator: Those are all good points. What skills did you begin to depend on?

Learner 5: I used my sense of hearing and touch to orient myself.

Nurse educator: Good. What does this experience tell you about how newly blind people might be expected to act?

Learner 6: That they will be scared at first, but then they will try to use their other senses.

Nurse educator: How can we state your findings so they will be useful to you when assisting newly blind clients?

Learner 7: Expect newly blind people to show fear, followed by a search of ways to use their other senses.

In this approach, the nurse educator reinforces and encourages further learner comment with statements that summarize, reward, or lead to the principle.

2. **An approach to learning principles that is related to the discovery approach is the disputation method.** In this approach, the curiosity of the learner is aroused via a provocative statement such as:

"Primary nursing entails more independent practice than does team nursing."
"Families should be encouraged to allow a dying family member to die at home."
"Nurses who counsel for abortions are acting unethically."
"Clients who are recovering from a heart condition should be cautioned against having sex."

Learners are then directed to obtain data from books, journals, consultants, and other sources to support or refute the statement during classroom debate. Learners can choose which disputes and which side of the dispute they wish to participate in. Some learners may choose to be moderators; their role is to summarize the discussion and state the solution agreed upon through debate. The role of the teacher is to serve as resource person, guide and stimulator.

The disputation method arouses curiosity by presenting a provocative statement that leads to debate.

3. **The third approach to teaching principles is to tell learners the principle.** This approach can be used when there is insufficient time or when there is no need to have learners empathize with the client.

4. **The fourth approach is to demonstrate applications of the principle.** For example, a film depicting the reactions of newly blind people could be shown to illustrate how they cope with blindness.

Principles and Problem Solving

Principles are used to solve problems. A problem occurs whenever a goal cannot be reached. **Problem solving** involves five steps including problem sensing, problem formulation, searching for solutions, evaluating the solutions and selecting the best one, and trying out and evaluating the solutions.

Problem Sensing

The first step in the problem solving process is problem sensing. The educator's role in this step is to teach learners to recognize a problem when they see one. Questions to use to alert learners to a problem include:

"What did the client say about his functioning?"
"What do you make of his response?"
"Does this indicate a problem?"

Problem Formulation

The second step in problem solving is problem formulation. In this step, the educator helps learners to formulate the nature of the problem and its elements in question form; for example:

"How can the nurse assist clients to comply with nursing orders?"
"What is the most effective way to conduct a nursing interview?"
"How can the nurse assess client readiness to learn?"

Problem solving includes problem sensing, problem formulation, searching for solutions, evaluating solutions and selecting the best one, and trying out and evaluating solutions.

Searching for Solutions

The third step in problem solving is searching for solutions. Information from many sources is collected to find a solution. The educator's role in this step is to assist learners to develop hypothetical solutions to be tried out. Some questions to ask learners are:

"What hunches do you have about what's happening with the client?"
"Who has an idea of what to do?"
"Don't be shy. Give your idea a try. Nobody knows all the answers—not even me."

Evaluating Solutions and Selecting the Best One

The fourth step is evaluating potential solutions and selecting the one most likely to be effective. The nurse educator's role is to assist learners in weighing the pros and cons of each possible solution to the problem.

Trying Out and Evaluating Solutions

The fifth step of problem solving is trying out and evaluating the most feasible solution. To assist learners through the problem-solving process, educators specify learning objectives focused on action verbs such as sense, formulate, search, select, and evaluate.

Learners must be given the opportunity to sense the problem, formulate it, search for solutions, select one, try it out, and evaluate it. Practice conditions should simulate

Nurse Educator Tip

Questions to ask to help learners weigh pros and cons:

"Which one of the solutions is the best and why?"
"If you had to weigh each of the ideas, what are the pros and cons of each one?"

encounters outside the classroom. Although maximum uncertainty is desirable, learners who are at a low level of cognitive complexity may become more rigid and less able to problem solve if faced with too much ambiguity. To prevent rigidity, learners should be presented with simple problem-solving practice conditions until those are solved. Only then should learners be placed in more ambiguous practice situations.

Developing Problem-Solving Learning Experiences

When developing problem-solving learning experiences for learners, it is important to exclude prompts or cues that alert them to the problem. Situations where potential problems exist but are unidentified and unformulated are necessary to teach and evaluate problem-solving skills.

Problem solving cannot be taught via the lecture method, but there are other methods that can be used in the classroom to encourage problem solving in learners, including:

- *Providing classroom experiences that include specific strategies and techniques for solving problems in the referent situation.*
- *Sharing clinical experiences and past experiences in nurse/client situations to assist learners to problem-solve and transfer classroom learning to other situations.* To use this option, nurse educators need to be excellent practitioners in order to have a backlog of clinical situations from which to choose when developing strategies and sharing experiences with learners.
- *Using the "think aloud" process* developed by Jack Lochhead and Arthur Wimbey (Breslow, 2001). Two learners work together to solve a series of problems. One learner is the problem solver who reports out loud everything going on in her head while attacking the problem. The other learner is the

Nurse Educator Tip

Modeling Problem-Solving

Nurse educators can increase the effectiveness of modeling effective problem-solving by:

- Labeling each step as it is performed, and
- Pointing out antecedent conditions, relationships, and consequences of any principles that were used.

listener who listens carefully, takes notes, and stops the problem solver whenever necessary by saying, "I don't understand; say it in other words," or "I'm not sure that's correct. I think you need to check that."

- *Modeling ways to solve problems.* When the nurse educator models the ways of solving a problem, learners are provided with the rare experience of observing an expert successfully performing the problem-solving process. Going down a blind alley to see if learners are listening can also be beneficial (Breslow, 2001).

Programmed materials, group methods, journal writing, simulations, and simulation games can also be used to teach problem-solving skills (see Chapters 3–6).

There are a number of rules and strategies to be used when implementing problem-solving practice situations.

1. **Describe a problem and then encourage learners to scan all the elements of a situation.** Ask learners to list as many factors affecting the system or problem as possible. Becoming bogged down in habitual ways of solving problems is antithetical to creative problem solving.

2. **Provide experiences viewing problems from different physical or symbolic positions.** Learners need experience in asking:

   How else can this object be used?
   How else can the elements of the situation be related?
   How can the behavior of the nurse or client be varied to change the problem?
   How is the nurse like a client?
   What would happen if the nurse were to take the client's place for a day?

3. **Encourage learners to list basic questions to use in solving a problem, such as:**

   Who can help solve the problem?
   Where can information about the problem be found?
   Which limits can be controlled or changed and which are fixed?
   What is allowed in solving the problem and what is ruled out?
   What rules could be changed or modified to solve the problem?
   Where can we go to be closer to the problem?
   How many solutions to the problem are there?
   Who can we discuss the problem with to clarify thoughts, feelings, or solutions?

4. **Suggest learners stop working on the problem when progress is impeded and return to it later.**

5. **Provide practice for learners in listening empathically to others' ideas and in being critical of their own.** For example, assign a paraphrasing exercise where one learner is to listen to another learner for five minutes and then paraphrase what the other said without judging, persuading, or reacting to what the other said.

6. **Encourage learners to continue to generate solutions to a problem past the point of previous solutions.** For example, post a large sheet of paper on the bulletin board or chalkboard so that all learners can see the formulated problem. Ask learners to use a felt-tip pen to write solutions to the problem on it, whenever one occurs to them. When the paper is filled, categorize the solutions using every solution suggested, decide on one, and try out and evaluate the agreed-upon solution.

7. **Ask learners to go to a new place or person each day for ideas, such as a new laboratory, a different school of nursing, a consultant, and so on.** Encourage them to bring back something that attracts them while visiting. Suggest that they should not be concerned initially with categorizing their acquisitions or whether the object is related to the problem. After a specified number of days, ask learners to try to relate their collection to the problem.

8. **Ask learners to devise a list of all the nursing theorists, practitioners, researchers, and educators they consider important.** Then ask them to pretend they are those people and explain how they might solve the problem.

9. **Ask learners to expand the problem by asking, "What is the problem?" and following it with, "And what is that about?" to each learner response that is given, until no one can go any further with the problem.** This allows learners to see the interrelationships among problems, principles, and situations.

10. **Ask learners to contract the problem to its essential base.** First, state the problem; then ask, "Why is that a problem?" Continue responding, "Why is that a problem?" to each learner response until no one can go any further with the problem.

Problem Solving and Perceptual-Motor Skill

Learning problem-solving skills often requires a great deal of thought and discussion; the development of perceptual-motor skills requires a different approach. As with any learning experience, learners should be provided with precise, clear objectives. Providing a picture, demonstration, description, film, or tape recording of the

criterion performance is helpful. This model performance provides the learners with an overview of the task. The overview should be brief and move the learner to direct practice in the task.

Educators need to keep in mind:

- Early in the training period, the learner needs maximum verbal guidance about how to proceed as well as demonstrations by the educator or others who have mastered the task, including peers.
- In complex tasks, such as learning to give an injection, learners can be given practice to criterion level in each of the subtasks of calculating medication, drawing up/mixing medication, and giving the injection. Once each of the subtasks has been mastered, a dry run through the entire task can be scheduled prior to actually giving the injection to a client.

■ Nurse Educator Challenge

Besides showing learners the subtasks in tasks, what would you do to enhance learning? Give a rationale for your answer.

Giving Feedback to Learners

Instructor feedback that can assist learning is the kind that helps to point out critical cues or prompts. Constructive comments are helpful, such as,

- "That's the way, wipe the vial off with the alcohol swab."
- "Pull back a few c.c.'s on the plunger and notice that there may be a bit of resistance to your pull."
- "Use the mnemonic device we discussed in class to help you remember."
- "Don't forget to remind the client why you're there."
- "Remember not to censor anything you say during this brainstorming phase."

By analyzing and describing subtasks, cues and prompts important to learning the complete task can be isolated. In addition to supplying cues or prompts, it is useful to provide the struggling learner with motivation to learn the task.

Motivation may be enhanced by making a positive comment after a subtask has been performed correctly (Bandura, 1997) such as,

- "Good; you drew that up without contaminating the needle."
- "Good job, you remembered the mnemonic."

According to Bandura (1997), any verbal or nonverbal communication after a learner action can reinforce it and increase the chance it will recur. It is important not to make negative comments when a subtask is not performed correctly. Negative comments such as, "Not that way," or "That's wrong," not only discourage the learner, they increase learner anxiety, and do not give information on ways of correcting the fault.

Time intervals between attempts to master a task or subtask should be brief. This is critical if the learner has made many errors and the learner or the educator is upset about this. When repeating the task practice, it is suggested that the nurse educator reestablish the learner's progress toward learning by making a comment before repeating the task such as "Remember to begin by . . . then . . . next . . . ."

If time does not intervene between practice sessions, the educator briefly brings the learner to a salient point with a comment such as, "Remember the last time you tried this, you _____; this time, remember to _____."

This kind of learning is best done in a simulated situation, where clients are not kept waiting for medication or treatment, and when no other health personnel are nearby to distract learners from the task. Once the task has been performed to criterion, learners are ready to try it out in a real-life nurse/client situation.

At the end of a practice session, learner and educator should review and summarize the practice session, or a learning aid such as a videotape or audiotape can be replayed as an evaluative tool and a way of comparing learner performance with the expert performance demonstrated on the tape.

Nurse Educator Tips

Criterion Performance

- Avoid setting the criterion of satisfactory performance too high at first when learners are beginning a task.
- Set criteria for satisfactory performance appropriately. This will lead to a higher rate of success and more highly motivated learners.
- Shape the learner's behavior by commenting positively on all approximations to the criterion performance.

The object of a postsession after practice is also to make factual and positively reinforcing comments, such as, "You were able to do _____ well, next time focus on _____."

Learners who find it difficult to master tasks may be given the assignment to rehearse the task mentally or to practice the movements of a task without actually handling the equipment or materials. This kind of practice between actual practice sessions helps the learner to focus on essential skills.

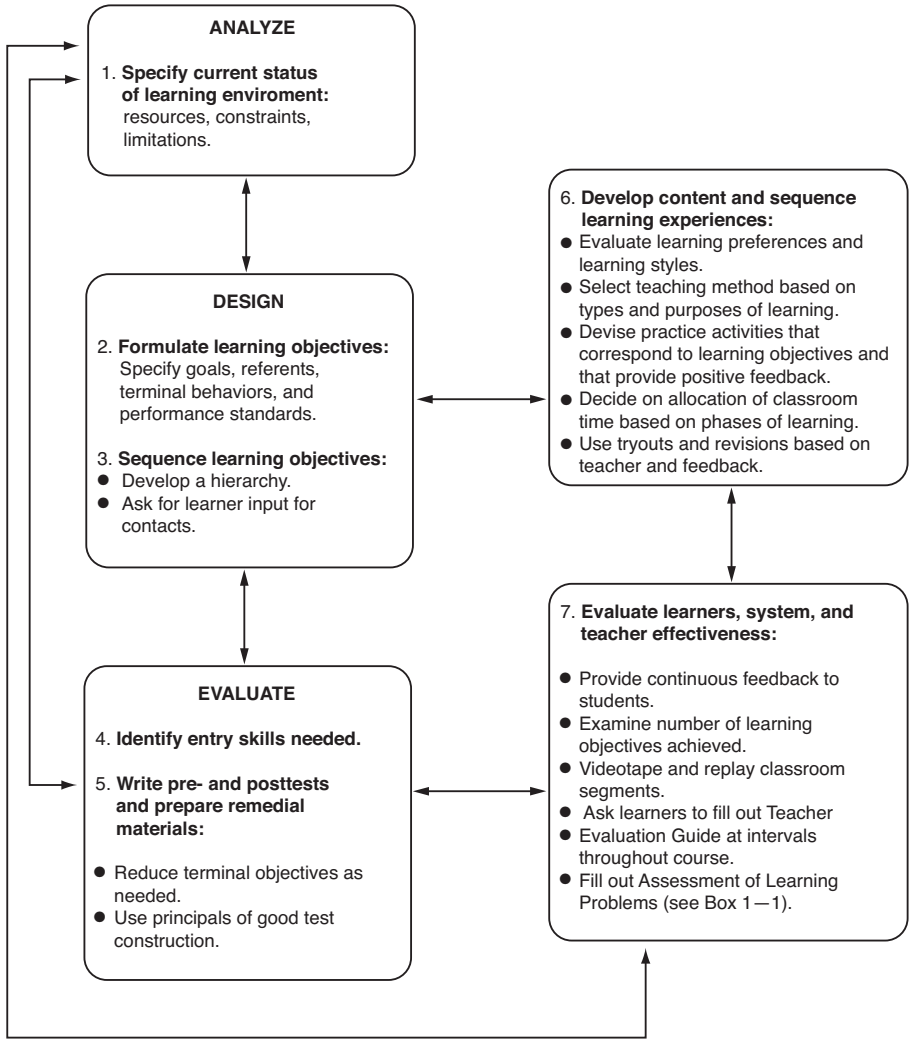
Regardless of the method chosen, the nurse educator needs to be concerned with how learning theory is applied. The following questions can be of help in assessing this aspect:

- Do I make sure that learners review behavioral objectives prior to beginning a learning system?
- Do I use cues or prompts to direct learners to important aspects of the matter to be learned?
- Do I present material in a way that is meaningful to learners?
- Do I provide remedial learning experiences, extra credit offerings, and between-class practice for learners who do not have prerequisite skills?
- Do I use my assessment of individual learning styles and preferences to point learners toward appropriate learning experiences?
- Do I underscore and positively comment on approximations to the goal?
- Do I set learning tasks that are neither too high nor too low?
- Do I actively involve learners in the teaching/learning process?
- Do I allow sufficient time for leadership, critical thinking, or psychomotor skill practice?
- Do I use modeling to increase the probability of learner performance to criterion?

Summary of Learning System Design

As this chapter has indicated, the process of analyzing the current status of the learning environment (analysis), formulating learning objectives, developing content and sequencing learning experiences (design), and evaluation are interactive and ongoing processes that are part of learning system design. See Figure 2–1 for a summary of the interactive quality of learning system design.

Figure 2–1 Flow chart for learning system design



Gagne's Learning Theory

Psychologist Robert Gagne was the foremost researcher and contributor to the systematic approach to instructional design and training. He believed instruction should be designed to include a variety of instructional methods to meet the needs of different learners. Gagne is often called a behaviorist because his focus was on the outcomes or behaviors that result from training. His four outcomes or objects of learning included:

- Verbal information
- Intellectual skills
- Cognitive strategies
- Motor skills

In his book, *The Conditions of Learning* (1995), Gagne identified the mental conditions for learning. He based his theory on an information processing model and created a nine-step process he called the Events of Instruction.

What makes Gagne's nine steps or events of instruction superior to Bloom's taxonomy is that learning conditions for each learning outcome are clearly recommended. These recommendations can help nurse educators develop instructions. The nine steps Gagne identified are:

1. Gaining attention
2. Informing the learner of objectives
3. Stimulating recall of prerequisite learning
4. Presenting the stimulus (learning content)
5. Providing learning guidance
6. Eliciting performance
7. Providing feedback about performance
8. Assessing performance
9. Enhancing retention and transfer

Step 1: Gaining Attention

Donna, a new nurse educator, complained to one of the more seasoned nurse educators that learners in her nursing theory class nodded off and looked bored. The learners never asked questions and rarely answered hers. The more seasoned nurse educator shared information about Gagne's theory. The next class,

Donna dressed like Florence Nightengale, carried a lamp and shared details in first person of her days nursing during the Crimean War.

Learners will be more ready to learn if they are physically and emotionally comfortable in the learning environment. After identifying learner learning styles and preferences (see Box 1–5 in Chapter 1) the educator uses this information to create a comfortable learning environment.

Once learners are comfortable, the nurse educator strives to gain learner attention. One way is to distribute a course or class period outline. Another way is to focus the learners' attention through the use of unusual materials or presentation of self, or use a thought-provoking question or interesting fact to begin the class. Curiosity motivates learning and attracts learner attention. Music or a multimedia program can also capture learner attention. Learners are more apt to be motivated if the material is not too technical or complex, and if it is meaningful to them. Another method is to add differential cues or prompts such as signs, written directions, or media that alert learners to new information to be focused upon. Stating objectives to learners, pointing out relationships, using reinforcing pictures or props to get a point across, and asking questions that will evaluate whether learners understood the objectives and how to attain them are all ways of facilitating the attention process.

■ **Nurse Educator Challenge**

What advantage to learning is there to stepping up the podium in front of a class of learners? Give a rationale for your answer.

Educators can count on prior learning to gain learner attention. For example, the educator stepping up to the lecture podium is often a cue to the audience that information is forthcoming (Gagne, Briggs and Wagner, 1992).

Step 2: Informing Learners of the Objectives

Early in each class, it is important to discuss learner-centered objectives to be achieved that day, e.g., "Upon completing today's class, you will be able to..." This not only activates interest in learning, but it gives learners a goal to strive toward. Handing out written objectives will provide a more permanent reminder of what was achieved.

Step 3: Stimulating Recall of Prerequisite Learning

A topic takes on added meaning when it can be related to the learner's everyday experience (Gagne & Medsker, 1995; Gagne, Wager, Golas, and Keller, 2004). Learners will be highly **motivated** to learn if they have the prerequisite skills.

The nurse educator directs efforts toward specifying the prerequisite skills needed to accomplish the learning goal, identifying learners who do not have those skills, and directing those learners to learning experiences that will provide them.

Learners will be less motivated when learning tasks are set too low. For this reason, it is important to identify the current state of learner knowledge. Some ways of achieving this are by asking the learner to tell or demonstrate what is known or by giving a written pretest. An online pretest or hard copy can be completed prior to class. Another option is to ask for a show of hands to 5-10 questions that exemplify content for that class. The way to create links to long-term memory is by tapping into personal experience and knowledge. A simple way to stimulate recall is to ask questions about previous related experiences, an understanding of previous concepts, or a body of knowledge.

Step 4: Presenting the Stimulus (New Content)

To obtain the best response, learners can complete a Web tutorial of the material or read chapters in their textbook. By presenting material in small, achievable steps, and organizing it in a meaningful way, learning is more apt to occur because moti-

Nurse Educator Tip

Modeling or Demonstration

When using the modeling (or demonstration) approach:

- Label the important aspects of the behavior being modeled,
- Be sure the modeling is done in an atmosphere where rewards for performing the behavior are forthcoming,
- Be careful not to punish learners for their behavior with words, facial expressions, or actions, and
- Use modeling when teaching technical and/or interpersonal skills.

vation is increased when success is more reachable. After each small step is achieved, it is important to provide praise (Gagne et al., 2004).

Motivation is enhanced by positive expectations, success in learning situations, meaningful material, and knowledge of goals to be achieved.

During the class, skills are explained first, then demonstrated. To appeal to different learner styles and preferences, nurse educators use a variety of strategies (see Chapters 3-6 for more information).

Corrine, a RN-BSN learner, was scheduled to make a class presentation the next week. She told her instructor, a nurse practitioner with stress management skills, that she got so stressed when she had to speak in front of a group that she nearly passed out. Her instructor gave her a schedule with small steps, including picturing herself making the presentation and getting up the morning of the presentation while remaining calm. Corrine worked through the schedule before her presentation, stopping to relax herself when a step made her feel anxious. She completed the hierarchy before class started and felt confident entering the classroom because she'd mastered each step.

Step 5: Providing Learning Guidance

To help learners encode information for long term storage, use the following guidance strategies: examples, non-examples, case studies, role playing, simulations, graphical representations, mnemonics, and analogies (Gagne et al., 2004).

Nurse Educator Tip

Motivating Learners

Make a classroom with pleasant learning conditions by:

- Setting learning tasks that guarantee success by breaking large tasks into a series of small ones,
- Giving learners frequent reports on their performance, with suggestions for improvement; for example, "That was good; now try it and make eye contact", and
- Rewarding learner performance immediately after attaining the goal and consistently after the attainment of each goal.

Step 6: Eliciting the Performance (Practice)

This step includes the learner practicing the new skill or behavior. Eliciting performance provides an opportunity for learners to confirm their understanding, and repetition increases the likelihood of retention and transfer to clinical practice (Gagne et al., 2004). Role playing, simulation, simulation gaming, lived case studies (such as the previous Nightengale example), simulated clients, and practicing procedures in the nursing laboratory can be helpful in this stage.

Step 7: Providing Feedback

Dr. Jefferson, a new nurse educator, tried her first simulation in class. She'd handed out written instructions for peers to provide feedback and stood around watching learners take over their own learning. She wasn't sure what to do until a learner raised her hand, indicating a need for help. That's when Dr. Jefferson hurried to the pair of learners and began to coach them and provide hints of what to do next in the procedure.

Prompts are another way to increase learning. At the beginning of practice, learners need many prompts, hints, and directions. Prompts could be anything from a word, a hand signal, a list of steps, a symbol, a flag or sign, or anything that provides information to learners about how to proceed. As learning progresses, these should gradually be withdrawn (Gagne et al., 2004). For example, when first being taught physical assessments skills, learners require step-by-step directions or clues about what comes next. As learning accrues, learners may need only beginning, middle, and end assessment directions. If prompts are withdrawn too quickly, learners can begin to make errors (Gagne, Briggs, and Wagner, 1992). Nurse educators must think through how to fade out learning prompts gradually to reduce errors.

Prompts are anything nurse educators use to remind learners of appropriate procedures.

While learners practice new behaviors, the nurse educator or a peer provides specific and immediate feedback of their performance. (If peers provide feedback, the nurse educator provides simple written instructions for them, including words to say.) Before pairing off learners, the nurse educator demonstrates the procedure in front of the class with at least one learner to solidify peer feedback skills, and answer any questions. Once all questions have been answered, learners pair off and begin practice.

■ **Nurse Educator Challenge**

Once learners are paired off, the best thing for the nurse educator to do is go sit in the back of the room and observe, true or false? Give a rationale for your answer.

The nurse educator's role isn't over. At this point, it is important to circulate around the class, coaching, giving hints about what to do next, and praising approximations to the goal. This role modeling behavior can help peer learners move along in competence, and provide feedback that might be missing from a peer. This kind of formative feedback can help learners correct their performance and achieve success as they repeat the task until the criterion is met. A commonly accepted level of mastery is 80% to 90% correct (Mager, 1997).

Step 8: Assessing Performance

After mastering the instructional module or class procedures, learners complete a verbal or written post-test, demonstrate their skill, or both. This assessment is not used for formal scoring. It is a method of enhancing comprehensive and encoding purposes. Learners are encouraged to ask questions and the nurse educator shares information and tips about how to improve performance. Or, if a written test is anticipated, the nurse educator discusses the questions and their answers, giving tips and additional information as needed.

Step 9: Enhancing Retention and Transfer

The final step in the learning process is retention and transfer (Gagne, Briggs, and Wagner, 1992). It is not yet completely clear how the retention phase can be influenced, yet some learning principles may be applicable. For instance, learning is more likely when the learner takes an active part in practice that is structured to achieve the learning objective (Gagne, Briggs, and Wagner, 1992).

Requiring learners to answer questions (verbally or in writing), asking them to reorganize or pass on to other learners the information they have learned, or using games and simulations as teaching strategies are ways of involving learners in active, whole learning situations. Games and simulation are especially likely to assist in the retention of learning, since affect associations are attached to concrete actions in

Nurse Educator Tip

Need for Repetition

Some questions to ask when assessing the need for repetition are:

- How new or complex is this material?
- How long is the attention span of the learner?
- How anxious or uncomfortable is the learner?
- What questions does the learner ask that imply need for repetition?
- What nonverbal clues does the learner give that imply need for repetition?

game playing and not merely to abstract symbols, as in information-processing or memorization (Digital Media Center, 2004).

Retention of material may be facilitated through repetition. When learners are physically, psychologically, or socially uncomfortable in their learning environment, material that is presented may not be retained. To counteract this, repetition of learning materials can be used to enhance learning. Factors such as newness and complexity of material, short attention span of learners, and learner anxiety indicate the need for more than one type of learning material or increased frequency of presentation (Gagne et al., 2004).

> Jacqueline, a new nurse educator, prepared a test using all of Gronlund's ideas for test preparation. When half the class failed, she had no idea what to do. She had to do something fast or fail twenty learners. She made an appointment with a more seasoned nurse educator and asked him what to do.

Whenever learners fail to learn, the nurse educator needs to locate the difficulty by examining a number of instructional areas including unclear learning objectives, direction, evaluation, content and sequencing method, and constraints. This begins the evaluation phase of the learning system process.

Evaluation and Learning Systems

Evaluation procedures are used to assess learning and to detect problems with learning systems. When learners fail to learn, a good place to start is to examine the behavioral objectives for clarity.

Unclear Learning Objectives

The first area to be examined when learners fail is initial structure or direction. When a problem exists here, learning goals or objectives are unclear or not understood by learners. The result is that learners try to outguess educators.

Grading and Evaluation Difficulties

Once the nurse educator has determined that the learning system problem is not caused by unclear objectives, evaluation procedures should be examined. When there is a problem with evaluation, unfair, unreliable, or invalid testing and grading procedures are used.

When learners are graded on the basis of having obtained a criterion level (Popham, 2001) rather than on their scores in relation to other learners', there are fewer difficulties in explaining a grade. Using Mager's theory (1997), the highest level of achievement of learning objectives would then be equivalent to an A or the highest grade.

Some comments made by nurse educators that provide evidence of difficulties in test development are:

- How do I grade fairly?
- How do I know learners are learning what I think is important?
- What parts of the course should be changed?

Nurse Educator Tip

Indicants that learners do not understand course objectives are evident in comments such as:

- What is the purpose of learning this?
- What should we take notes on?
- What should we focus on when we study?

Possible solutions:

- Check to make sure learning objectives are clear and specific.
- Ask learners to read the learning objectives for the course.
- _____ (your idea)

Learner comments that reveal evaluation difficulties are:

- The test questions are ambiguous.
- Have I really learned anything in this course?
- What's the difference between an A or a B (or pass or fail) in this course?

■ Nurse Educator Challenge

What is the advantage of using criterion-referenced grading? Give a rationale for your answer.

Nurse Educator Tip

Grading

- Grade only on learning; avoid grading on class participation, attitude, and other nontangibles unless they are directly related to a learning objective and can be tested.
- Give learners feedback on their learning throughout the semester.
- Clearly state grading policies in writing on the course syllabus, including weight of various assignments, any allowances for extra credit, redone papers, or late assignments.
- Short tests or writing assignments every week or two are preferable to a midterm and final.
- Allow learners to choose learning methods to support what they know: for example, journaling critical issues and solutions, researching projects and reporting findings, developing a study guide or audiovisual materials for the course, or reviewing literature for a specific disease.
- Allow learners to drop their lowest grade or do extra credit.
- Ask disgruntled learners to wait a day after receiving a low grade and write down their complaint and justification for a grade change; resist pressures to change a grade due to personal reasons such as the need to do well in grad school, and focus on the exam and what was missing (Davis, 1993).
- When scoring a test, use a computer-programmed item analysis to find out how well your items discriminate among learners; throw out the worst, keep the best, and build a bank of test items (Oermann and Gaberson, 1998).

Criterion-Referenced Grading

Criterion-referenced grading is the kind of testing nurse educators need to learn about and use more often, if not exclusively (Mager, 1997). Criterion-referenced grading is consistent with the State Board Examination system, where it is assumed that the applicant is eligible for licensure when a score at or above a cutoff point has been attained, not when scores are curved and then assigned grades.

Criterion-referenced grading means a learner is graded on the basis of having obtained a criterion level, not on their score in relation to other learners.

Criterion-referenced measurement is also consistent with a cooperative (rather than a competitive) learning environment, where learners are taught how to teach one another. Peer teaching and peer supervision not only give learners the idea that they are competent and responsible learners, but help to prepare them for their own professional life, of which peer review and supervision of others is a part.

Content Sequencing Problems

> Oscar, a nurse educator who'd mastered test construction, was surprised to overhear two learners discussing his class. "I can't follow where he's going. And the syllabus isn't any help. It doesn't go in order and I'm having a hard time with this course. I like the teacher, but I'm going to fail if I don't get some help." Oscar took their words to heart and decided to fix whatever was wrong with the course.

If there are no indicants that evaluation is a problem, the next area to examine for difficulties is content sequencing. If important skills are not taught or are overtaught, or if they are taught out of sequence, learners may perceive the course as trivial, irrelevant, disorganized, or incomprehensible. Learner comments that indicate problems of content omission or sequencing are:

- I don't understand this course.
- The teacher talks over our heads.
- The teacher repeats things we already know.
- We aren't taught what we're tested on.

Educator Method Issues

Another area to examine is teaching method. When learning theory is not used to motivate learners and promote learning, learners may not learn, and they often complain of

being bored, or they try to avoid class. Another indicant that a teaching method is inappropriate is low learner performance in clinical areas.

No one method is appropriate for all learning objectives. Teachers who have limited repertoires of classroom skills and methods are apt to have teaching/learning problems in this area.

Lack of Resources

Another area to examine is the constraints imposed by deficits in educator skills, learner abilities, and school resources. Some of these constraints result from educators not being oriented to essential institutional knowledge, being expected to teach in overcrowded classrooms, or being given too many administrative tasks. Educator expectations of learner abilities may be above or below what exists, and there may be a failure to use available instructional resources, or a lack of these resources. No instructional environment is completely conducive to learning; when the nurse educator is faced with overwhelming institutional constraints, learning will be difficult, if not impossible, despite the effectiveness of direction, evaluation, content, and method.

Evaluating Learning

Evaluation is an ongoing process. It is goal directed and requires the use of appropriate measures and tools for collecting information. To evaluate effectively, an educator can collect information that answers the following questions:

"Did the learning system succeed?"

"What should be changed in the learning system?"

There are three sets of evaluation questions to be concerned about—entry skill questions, instructional procedure questions, and terminal objective questions.

Entry skill questions include the following:

1. Which learners have the entry skills needed to proceed?
2. Which skills does each learner lack?
3. What modifications or extra practice is needed to bring skills of all learners up to entry level?
4. What feedback will be helpful to learners about their skill level?

Grades in previous courses usually do not give a good measure of entry skills. The nurse educator prepares tests for measuring entry skills. If courses have been established using the method espoused in this chapter, the final examination of a previous course or unit may provide an entry skill test or pretest if terminal objectives have been specified. If this is not the case, the educator develops a pretest to determine the entry skills of learners.

Uses for Pretests

When the major criterion of teaching effectiveness is learner achievement, effective instruction occurs when most (if not all) learners achieve the objectives. A good way to test the clarity and specificity of an objective is to write a test item to assess learner achievement (Kizlik, 2006).

Pretests can be used to evaluate what level of learning a learner has reached at that moment. Using differences in score from pretest to posttest (after instruction), they can also be used to measure the process of learning. Pretests can also be used to move learners to the next learning system if they attain a score of 90 or higher. In the latter case, there is no need to bore learners by requiring that they redo learning experiences they have already mastered.

Use pretests to evaluate where the learner is now and to chart the process of learning to the posttest.

A pretest could be a written examination, a verbal examination, or a demonstration of a skill. A final use of pretests is for research on the effectiveness of learning systems. For example, the educator may compare the attainment of terminal objectives achieved by learners at the end of instruction for each system. To use pretests in this fashion, the educator obtains two equivalent groups of learners and pairs them according to score on a pretest. Since research has demonstrated that the most critical self-reports are distorted by the person's desire to appear competent to others, observations can be biased by observers' "blind spots" (Gronlund, 2000).

Before developing test items, it is important to understand the concepts of reliability and validity.

Test Reliability

Jenna, a nurse educator, asked several graduate nursing learners to help administer her test to various sections of class. When she examined the results and found that the three sections tested by the graduate learners scored much lower on the written exam, she went back to her nursing research text to find an answer. In her rush to test her group of learners, she remembered she hadn't prepared the graduate nursing learners properly to administer the exam.

An important question to ask about a test is: How can I be sure I'm consistently measuring what I'm measuring over time and between different raters? This is the question of **reliability.** Unclear questions and inadequate scoring materials can lead to unreliable testing. Essay questions can be particularly open to unreliable results, unless a very specific scoring system is in place. It is important to develop a detailed scoring system prior to administering the test (Gronlund, 2000).

■ Nurse Educator Challenge

What would you do about the learners who scored so much lower?

Increasing Reliability of Evaluation Tools

Reliability is important because without it, tests cannot be valid, although the reverse is not true. Reliability provides the basis of consistency, which makes it possible for a test to be valid. Reliability is a statistical concept that can be estimated by

Reliability is a measure of consistency over time and/or between raters.

- Giving the same test twice to the same group (test-retest method),
- Giving two forms of the test to the same group (equivalent forms method),
- Giving the test once and scoring two equivalent halves of the test (split-half method), or
- Applying the Kuder-Richardson formula (Gronlund, 2000).

Steps to take to increase the reliability of tests include:

- Providing a long test to lessen the possibility of chance guessing,
- Developing tests that are neither too easy nor too difficult by basing them on the level of ability of learners,
- Providing a sample unit on taking tests to reduce learner anxiety about failing,
- Deleting jargon words,
- Ensuring that test conditions fulfill stated behavioral objectives.

Tests should differentiate between learners who have fulfilled the terminal objectives and those who have not. One way to ensure differentiation is to give the test to learners who have already completed the learning system (or course). Test items that cannot be answered by these learners should be redone or eliminated (Gronlund, 2000).

A concept that is as important as reliability is validity.

Test Validity

A well-designed evaluation tool is both valid and reliable. **Validity** is concerned with whether a test is measuring what is hoped to be measured. Content validity determines whether the tool measures the behaviors under consideration (Gronlund, 2000) or something else.

Validity is concerned with whether a test is measuring what is hoped.

Criterion-referenced measures are validated primarily in terms of how well they represent the criterion (Popham, 2001). Some questions to ask are:

- What is the criterion behavior I want to measure?
- What is the best way to measure this criterion behavior?
- How well does the test represent criterion behavior?

Developing Valid Test Materials

Essay questions must test more than recall of facts to be valid. Essay questions must make sure learners

- Compare and/or contrast important interventions,
- Outline steps or protocols,
- Explain and summarize effects or data,
- Apply concepts and theories to a situation, or
- Analyze multiple nursing interventions for a client and provide supporting rationales (Oermann and Gaberson, 1998).

Some test factors that influence validity are:

- Unclear directions on appropriate responses to items,
- Overly complex sentence structure or vocabulary,
- Use of obscure factual information,
- Inappropriate level of difficulty of test items,
- Poorly constructed test items,
- Ambiguity,
- Test items that are inappropriate to the (hierarchy) level meant to be measured,
- Too few test items used,
- Test items arranged improperly, or
- An identifiable pattern of answers (Gronlund, 2000).

Box 2–4 compares suitable compatibility among learning objectives, tests of the objectives, and practice conditions that can lead to valid tests.

Box 2–4 Planning Valid Reproductive and Productive Learning Tests

Reproductive Learning

Objective	Test practice	Condition
1. Given syringe, needle, and medication vial, the learner will draw up and administer precalculated IM medication.	1. The learner administers an IM injection to a manikin.	1. Give learners practice doing the procedure with syringe, needle, vial, and IM medication card.
2. Using the Diabetic Teaching Guide, the learner will conduct a 20-minute teaching session with a client who has diabetes.	2. The learner conducts a 20-minute teaching session with a simulated client who has diabetes, using the Diabetic Teaching Guide.	2. Give learners the Diabetic Teaching Guide to study and practice in presenting the information, listening to the client, eliciting questions or reactions, and ending the teaching session. Use prompts when necessary.

Productive Learning

Objective	Test practice	Condition
1. The learner will solve nine of ten medication dosage problems correctly.	1. The learner gives ten dosage calculations not encountered in practice.	1. Give information on calculation and practice in solving problems using corrective feedback. Give tests until the learner attains 90% correct on the test. Give remedial instruction if necessary.

Box 2–4 Planning Valid Reproductive and Productive Learning tests (continued)

Objective	Test practice	Condition
2. The learner will identify the group concept of conflict and identify examples of it in novel situations.	2. The learner identifies examples of group conflict in an unfamiliar videotaped scene.	2. Teach the concept. Demonstrate how to assess group conflict. Give the learner practice with feedback on identifying examples of group conflict.

When designing test questions, the educator must decide whether reproductive or productive learning is important. For **reproductive learning**, the learner knows the exact content of the test and has practice on that content. In this case, the pretest and posttest could be the same. For **productive learning**, the learner is taught principles and is given practice in solving problems, but the content or problem examples in the test differ from the practice content or problems (Briggs, 1991). In this case, the posttest would differ from the pretest in the specific problems given, but would cover the same concepts or principles. When learning objectives are closely tied to outcome measures, there is a greater likelihood that the evaluation tool is valid, whether productive or reproductive learning is focused upon.

Reproductive learning is when the learner knows the exact content of the test and has practice on that content.

Productive learning is when the content or problem examples in the test differ from the practice content or problems.

Box 2–5 illustrates some of these test construction difficulties and their correction.

Developing Items that Test for Critical Thinking

To promote and measure critical thinking, multiple choice questions should:

- Be up-to-date with current clinical practice in the area,
- Be at application or above cognitive level,
- Require multi-logical thinking, and
- Require a high level of discrimination among plausible alternatives (Morrison and Free, 2001).

Box 2–5 Poorly Constructed and Reworked Test Items

Poorly constructed item	Reworked item
Essay:	
Discuss the implication of learning theory to teaching. (unclear and simplistic question)	Describe how you would use learning theory when teaching (a) clients or (b) other learners. Include specific applications by identifying teaching strategies discussed in class and by giving a rationale for each strategy.
Completion:	
Observations are biased by _____ (Critique: more than one answer could apply)	What quality of the observer could bias observations? _____ (Suggestion: phrasing a question helps to qualify what precisely is being asked)
Multiple choice:	
Reliability is a A. Introductory measure B. Measure of consistency C. Useful adjunct to tests D. Enabling objective 1. A and B 2. A and C 3. A, C, D 4. A only (Critique: use of article, "a," provides a clue that the answer begins with a consonant; multiple-multiple choice is an overly complicated method that may confuse students)	Reliability is the A. Measure of consistency B. Primary measurement C. Enabling objective D. Best adjunct to teaching

Box 2–5 Poorly Constructed and Reworked Test Items (continued)

Poorly constructed item	Reworked item
Matching: __ Validity A. Unclear directions __ Reliability B. Length of test __ Measurement C. Validity __ Sampling error D. Nonrepresentative (Critique: no directions on how to match)	Directions: On the line to the left of each factor that influences test characteristics, place the letter from the test characteristic column that is influenced. Each character may be used once, more than once, or not at all. Factors that influence test characteristics: __ Learning objectives A. Validity __ Validity B. Reliability __ Length of test C. Reproducibility __ Unclear directions __ Use of obscure information __ Reliability (Suggestions: clear directions on how to match responses decrease measurement error. Placing shorter responses on the right increases the efficiency of test taking. An unequal number of responses decreases chance guessing. Ensure there is homogeneity in test characteristics.)

To evoke critical thinking, questions assist learners to:

- Identify problems and issues to solve and their rationale for choosing them,
- Zero in on different points of view and the reasoning behind their answers,
- Describe how they plan to solve problems and give a rationale,
- Examine how key concepts and principles are used to analyze situations,

- Identify their assumptions and tell how they affect their thought process,
- Evaluate the evidence used to support a specific position, and
- Compare varied solutions and outcomes for a specific situation (Oermann and Gaberson, 1998).

Some techniques for writing multiple-choice questions that measure critical thinking ability include asking learners to identify the correct outcome of a given circumstance, map the relationship between two items in different contexts, understand a case study and tie it to theory, provide what is missing or needs to be changed within a provided scenario, and evaluate solutions based upon criteria provided.

Some examples of multiple-choice items that test for critical thinking ability follow:

1. You see Christa, a young married woman, in the clinic for a broken humerus, and her x-rays reveal past fractures. Circle the best option for the nurse:
   a. Ask her if her husband abused her.
   b. Call the police and report her husband.
   c. Show her the x-ray and ask her if she'd like to talk.
   d. Hand her information about a local shelter.
   e. Tell her calcium would help strengthen her bones.

To reveal the thought process of the learner, space is left to provide a rationale for the answer chosen.

2. A follow-up study of graduates of a nursing program revealed that 75% of the learners who received an A in psychiatric nursing worked as graduates in psychiatric nursing. Which of the following interpretations of this findings is most valid? Circle your response and provide a rationale for your choice.
   a. Receiving an A in psychiatric nursing may be related to future practice in that specialty. Rationale:
   b. Graduates of that nursing program are more likely to practice in psychiatric nursing than in other specialties. Rationale:
   c. If you get an A in psychiatric nursing as a learner, you will be prepared to work as a psychiatric nurse. Rationale:
   d. The more knowledge you have of psychiatric nursing, the better prepared your are to practice in that area. Rationale:

3. Mrs. Sears, a forty-five-year-old pregnant Catholic woman, is expecting her fifth child. She came to the wellness clinic today looked disheveled and crying. She tells you she doesn't want this child.

■ **Nurse Educator Challenge**

Choose an answer from those that appear below and give a rationale for your choice.

   a. Tell her she's too far along for an abortion. Rationale:
   b. Ask her if something's changed. Rationale:
   c. Refer her to a psychiatrist. Rationale:
   d. Refer her to a mental health nurse. Rationale:
   e. Refer her to her priest. Rationale:

4. You are in a new position working in a clinic that provides pain relief. You notice that the nurse uses relaxation measures and self-hypnosis to help clients reduce pain, while the nurse practitioner uses medication. Circle the best solution to this issue and provide a rationale.
   a. Ask the nurse and nurse practitioner separately for their results. Rationale:
   b. Take care of your own clients; this doesn't concern you. Rationale:
   c. Design a research study to compare the two approaches. Rationale:
   d. Mention it to the nursing supervisor and let her handle this. Rationale:

Another issue to considered when developing test questions is ensuring that course content is covered.

Ensuring Course Content Is Covered

Bess, a new nurse educator, tried to lecture on every point mentioned in the textbook until she found out there was another way to make sure important course content was covered.

To ensure that course content is adequately covered, a chart showing terminal objectives for each learning system should be prepared. Box 2–6 shows a table constructed for a learning system on families. Each objective is weighted according to its contribution to successful performance in the referent situation. Increased weight is given by assigning a greater number of points to questions that correspond to an objective or by assigning more test questions to them.

Box 2–6 The Number of Questions for a Test on a Learning System on Families by Behavioral Objectives

	Objectives						
	Knows		Understands	Demonstrates skill in			
Course content	terms	concepts	Influence of parts of the system	assessment	intervention	recording	total
The family unit	2	4	3				9
Problematic family interactions	3	2	3	2		2	12
Effective family interactions	2	2	3	2		3	12
Family roles	2	3	2	2		2	11
Communication skills with families	1	1	4	3	6	3	18
Total # of items	10	11	16	9	6	10	62
% of items	16	17	26	15	10	16	100

Weighting Course Objectives

When terminal behavior is complex and short-answer questions are not applicable, the nurse educator can make a subjective judgment about the importance of each objective and assign a weight of between one and three. A number of ways can be used to assign grades by this method:

1. Translating the total test score into a letter grade of A, B, C and so on.
2. Setting a fixed percentage of objectives as passing (often 80 or 90 percent).
3. Setting a fixed number of objectives as a criterion level; for example, if there are five objectives, learners who attain all five receive an A.
4. Ranking objectives by level of difficulty. Learners who attain the lowest level receive a C; learners who attain the highest level receive an A.

In each of these methods, the criterion for judging learning is the attainment of learning objectives, not how learners performed in relation to one another. Grading on the curve provides no information about attainment of learning objectives, gives ambiguous information about learner preparation for future learning systems or courses, and may be unfair to learners who have achieved many objectives but still receive a low grade. Assessing achievement of learning objectives may be the best method of measuring instructional effectiveness (Taylor and Runte, 1995).

Learners can also be queried about their judgments of instructional effectiveness. Some topics that could be evaluated by learners in a written or verbal survey are:

- Instructor involvement,
- Learner interest in the course,
- Nurse educator/learner interaction,
- Learning system demands,
- Learning system organization and structure,
- Grading and examinations,
- Relevance of the course or learning system to clinical work with clients.

Nurse Educator Tip

Meeting Learning Objectives: Determining Why Objectives Are Not Being Met

To find out why objectives are not being met by learners, ask yourself the following questions:

- Were objectives clear to the learners?
- Was subject matter organized so that objectives could be met?
- Was there adequate balance between structure and freedom in the objectives (to encourage learning)?
- Were sufficient examinations and demonstrations given?
- Was there sufficient opportunity for learners to practice skills?
- Did learners receive adequate feedback about what they were learning?
- Did learners lack prerequisite skills or knowledge?
- Were learning styles or preferences overlooked?

In addition to evaluating learners on the basis of end-of-system or end-of-course grades and questionnaires, it is helpful to have ongoing evaluation procedures in progress for both learners and educators. This method can provide valuable feedback and enhance learning. It also alerts learners to their progress or lack thereof.

Obtaining Feedback on Educator Practices

Thom, a seasoned nurse educator, was acting as a mentor for Tess, a new nurse educator. She asked him whether he used the school educator evaluation tool or whether he had his own. Thom told her that periodic post-class questionnaires or small group discussions can be used to obtain learner feedback regarding that day's classroom activities.

Some areas Thom suggested she cover in her daily class evaluation were:

- What was worst and best about the class period?
- What was accomplished, what prevented more from being accomplished?
- What questions and suggestions do learners have?

It is wise to ask for anonymous feedback about grading clarity and fairness after an assignment has been returned. Learners are more apt to be honest if they do not have to write their names on an evaluation.

Disgruntled learners who identify themselves and are obviously upset about their grade can be asked to wait a day, write down their complaint, and justify a grade change. Davis (1993) suggests resisting pressures to change a grade due to personal needs (Dean's List or grad school) and focus on having the learner explain the fault of a test question or justify the correctness of a paper.

■ Nurse Educator Challenge

What would you tell a disgruntled learner who wants a grade elevated because her parents would be very upset if she doesn't do well? Give a rationale for your answer.

Long-term feedback can be planned by involving learners as members of curriculum committees.

Nurse educators can devise evaluation guides to help learners develop skills needed to evaluate their teachers. Information gleaned from completed guides can provide useful feedback as well as teach learners to assess others' skills systematically. This is the kind of experience that may be readily transferable to clinical situations, where nurses use assessment skills to evaluate the performance of peers and clients.

Many educator evaluation forms are nonspecific and tend to reflect learner attitudes and opinions. Such evaluations may add to teaching/learning difficulties. To change to more constructive behavior, evaluations should provide specific, objective information on educator performance. Box 2–7 illustrates the kind of evaluation that can give specific feedback about teaching effectiveness. Such an evaluation can also provide useful information about learner ability to evaluate classroom instruction and their learning styles and preferences.

Box 2–7 Nurse Educator Evaluation Guide

Directions:

For me to be an effective nurse educator, I need your feedback on my performance. Please answer the following questions for the designated class period.

1. Which words did I use today that you did not understand?
2. Describe any situations where I punished or put down students in the class today.
3. Which of the questions that were asked today were not answered satisfactorily?
4. What led you to conclude that the question was not adequately answered?
5. Give specific examples of teacher indifference to student needs.
6. Give specific examples of how class discussions or individual student ideas were discouraged.
7. What other feedback would you like to give me? (Be sure to be specific.)

Feedback as Evaluation

Learners require continuous feedback. Tests should be frequent and educator reaction to learner progress should be given regularly. When the mastery learning method is used, learners know exactly what has been learned and what needs to be focused

upon, since no learner can progress to the next learning system without satisfactorily meeting the objectives for the current unit.

Media can also be used to provide feedback to learners. Programmed instructional materials, simulation games, flash cards, value clarification exercises, and quizzes given and corrected by the learners themselves can provide feedback regarding knowledge of facts, concepts, and principles as well as their ability to work collaboratively with peers and to be self-directed in their learning. Videotape playback and educator demonstration with learner redemonstration can provide feedback concerning complex motor skills. Audio- or videotape playback, role playing with subsequent discussions, peer supervision, perceptual exercises, journal writing, and small-group exercises (see Chapters 3–6) can provide feedback about complex interpersonal or cognitive skills.

Giving Post-tests

When learners have mastered more complex discriminations, a **post-test** is given. Make sure that learners can discriminate examples that lay people would find difficult to distinguish. For example, lay people might be able to recognize that a client is upset, whereas a competent professional nurse would be able to identify indicants of levels of anxiety. It is important to include new examples on the post-test; otherwise, learners will be being tested for memory rather than for concept attainment. For anxiety, learners may be presented with a simulated anxious client, a film that depicts anxiety, or a written test that presents new examples as a post-test.

A post-test is administered at the end of a learning segment or learning system.

This chapter has provided information for planning, implementing, and evaluating learning systems. This chapter and all other chapters that follow provide beginning and more advanced exercises for nurses educators to help assist in active learning and critical thinking.

EXERCISES FOR NURSE EDUCATORS

1. Learn from other educators

Talk with, sit in on a class with, or examine course materials created by another nursing educator. Use the information presented in this chapter to evaluate the effectiveness of the learning system(s). Ask yourself: What did you learn from the other educator's mistakes and competencies?

2. Design a learning system
Using the information in this chapter, devise a learning system for one aspect of nursing. Pick a small, workable topic for initial practice. Ask yourself the following questions when designing the system:

- Did I specify institutional goals and constraints?
- Did I specify resources available for planning, evaluating, and trying out the learning system? (Include people, materials, and equipment.)
- Did I specify procedures for overcoming (or living with) constraints?
- Did I specify skills I need to develop in order to design a learning system?
- Did I formulate learning objectives, using learning theory, referent situations, terminal behaviors, and performance standards?
- Were learning objectives sequenced according to a hierarchy of difficulty or importance?
- Was learner input collected? For example, was a learning contract written or a guide for one developed?
- Were plans included to evaluate learner learning preferences and styles?
- Were learning experiences selected based on type and purpose of learning to be achieved?
- Were there sufficient directions and aids to assist learners to identify and reach learning objectives?

3. Transfer
List ways classroom experiences affect how learners interact with clients and other learners.

4. Application of learning principles
Devise ways to use the following in the classroom:

- Motivation
- Prompts and cues
- Active learning
- Repetition
- Recall
- Modeling
- Feedback

5. Process records
Begin a record or journal of your disappointments, triumphs, learning, frustration, inventions, and so on as you develop learning systems. They will be of use to you in future planning and can be used to guide others. Consider writing an article about your experiences in learning system design.

ADVANCED LEARNING EXPERIENCES

6. Gagne and Taxonomy
Devise a table comparing Gagne's conditions of instruction with Bloom's taxonomy and gives examples of each that are pertinent to teaching learners.

7. Communication Problem
Plan and execute a role-playing situation demonstrating a communication problem and its solution.

8. Motivating
Using the Nurse Educator Tip on Motivating Learners, try out the suggestions, and evaluate the results.

9. Research Problem Statement
Design a research problem statement regarding motivating nurse learners.

10. Bandura
Model a procedure for nursing learners or classmates using Bandura's social cognitive principles to evaluate your performance and derive implications of your findings.

11. Behavioral Objectives
Teach three novice nurse educators how to construct behavioral objectives using first Bloom's taxonomy and then Mager's goal theory. Seek feedback from your learners and redo your performance with another group, using their suggestions.

12. Curriculum
Build a curriculum for a nursing program, ensuring course objectives and content correspond to program and school or college objectives.

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