

Online Instructor's Manual and Test Bank
to accompany

**Learning and Instruction:
Theory Into Practice
Sixth Edition**

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INTRODUCTION

Dear Colleague,

The purpose of *Learning and Instruction* is to provide an overview of early learning theories and present comprehensive accurate information about contemporary theories with educational applications. The supplementary materials included in this *Instructor's Manual* are intended to assist in the teaching and learning processes. The contents are as follows:

- Chapter overviews and answers to chapter questions – included for all chapters
- Student misconceptions – summaries provided for theories that often are misunderstood – behaviorism, operant conditioning, Piagetian theory, and Vygotsky's cultural-historical theory.
- Classroom/Homework exercises – brief scenarios to be analyzed and other questions designed to address students' misunderstandings. Exercises are provided for classical conditioning, operant conditioning, Piaget's cognitive-development theory, Bandura's social- cognitive theory, and Weiner's attribution theory.
- End-of-Class projects – four scenarios to which different theories may be applied in the solution of the problem.
- Test item bank – matching, multiple-choice, short-answer/essay, and application items organized by chapter. These questions require critical thinking, not the recall of memorized information.
- Test bank answer key – answers for items.

We hope these materials are helpful to you and your students.

Best wishes,

Sandra McCloy, Ph.D.

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CHAPTER 1: OVERVIEW

Chapter Overview

The purpose of this chapter is fourfold. First is to describe the importance of learning to both the individual and society and the pre-theoretical attempts to explain learning. Second is to describe the criteria for theory and the functions of learning theory. Third is to discuss trends in the development of learning theory from 1950 to the present. They are the shift from the laboratory to the classroom (1950-1975), the rise of cognitive psychology (1975-1990), and the rise of personal, social, and cultural factors in learning (1980-present). Fourth is to present the philosophy referred to as constructivism and to describe educational constructivism. This philosophy influences the views of many teachers about classroom learning. The chapter concludes with the organization of the text.

Answers to Chapter Questions

Understanding Concepts

1. Individuals are better able to adjust to changing economic situations that demand new skills. They also are in a position to discover new ideas and/or to improve or to refine existing procedures and technology.
2. According to Suppes, such research is trivial because it does not contribute to a conceptual understanding of the instructional process.
3. The philosophy of Plato, idealism.
4. Philosophy requires logic and consistency of reasoning processes and is based on valuing individual views of reality. Theories generate hypotheses about events that are testable through observation and data collection and are based on ideas, experiences, and the pursuit of verifiable knowledge.
5. Leahey maintained that the so-called “cognitive revolution” did not meet the criteria for a revolution. Specifically, (1) behaviorism, the dominant perspective at that time, was not a unified world view; (2) the anomalies and problems faced by behaviorism did not lead to abandonment of the principles; and (3) the cognitive trend did not address the problems that behaviorism did not solve. Instead, new developments in other fields (such as the computer) led to new problems and questions to be answered.
6. Personal constructivism agrees with Piaget in that (1) the individual constructs knowledge and concepts (does not passively absorb knowledge); (2) learning is an internal process that occurs in the mind of the individual; and (3) essential learning processes are the cognitive conflict and reflection that occur when one’s thinking is challenged.

Applying Concepts to Instructional Settings

1. a. Like other maxims, it is too general to be useful to the teacher.
b. The maxim may be interpreted in different ways, including (a) be a firm disciplinarian, (b) if the teacher is not super-strict in the first few months, he or she won't be able to control the class, and (c) the rules are more important than anything else in the class.

Pre-service teachers should be taught classroom management strategies (appropriate for different age levels) that respect students as well as provide guidance for structuring and implementing classroom activities.

2. The holistic approach to literacy known as whole language, which is one form of philosophical constructivism.
3. Social constructivism
4. Responses will vary.

Additional Discussion Questions

1. The philosophical approaches to learning were concerned with the source of human knowledge, i.e., knowledge is innate or it is acquired through sensory experience. What are some learning activities that clearly would be acceptable to idealism but not realism? (An example is going on a field trip).

CHAPTER 2: EARLY LEARNING THEORIES

Chapter Overview

The purpose of this chapter is to introduce the student to (a) the behaviorist theories that were the forerunners of operant conditioning, and (b) Gestalt psychology, the precursor to cognitive psychology. The chapter first discusses Pavlov's research, the classical conditioning paradigm, Watson's application to a theory of emotion, and classroom applications of classical conditioning. Discussed next is Thorndike's connectionism, which addresses voluntary rather than reflex behaviors. It is important for two reasons. First, his model served as the nucleus of Skinner's work on behavioral change. Second, some curriculum content is taught as connections between items of information.

The second part of the chapter describes the early movement in psychology that (a) served as the foil to behaviorism, and (b) kept alive an interest in mental events: Gestalt psychology. Important points about Gestalt psychology are that the advocates (a) rejected the micro focus of behaviorism, (b) focused on perception and its characteristics, and (c) applied issues in perception to problem solving. Discussed in this part of the chapter are the laws of perceptual organization, the insight experience, arbitrary and meaningful learning, transfer of training, problem approach, functional fixedness, and problem set. The chapter concludes with a comparison of behaviorism and Gestalt psychology on basic assumptions, typical experiments, and learning formulas, and also discussed the limitations of both theories.

Answers to Chapter Questions

Understanding Concepts

1. Girls screaming "Boo" —————▶ fear reaction
+
Spider in girl's face

Girls screaming "Boo" —————▶ fear reaction
+
Spider found in bed

Seeing a spider —————▶ fear reaction
2. The phenomenon of drug tolerance is the result of conditioned responses to the substance, also becoming conditioned to the cues that precede drinking the coffee. Thus, the substance has less of an opportunity to have a physiological impact.
3. These beliefs reflect the "mental discipline" concept (which has roots in Plato's philosophy) and were refuted in a study by Thorndike.
4. Einstellung or problem set

5. The re-arrangement or reconfiguration of elements provides an opportunity for partial insight into the nature of the problem.
6. The insight problems used by the Gestalt psychologists required a reorganization of visual elements in some way. In other words, accurate visual perception of relationships among the elements was essential. Insight in a subject domain requires a strong background in the facts, concepts, and principles of the domain and hard work on problems in the field. Insight involves “seeing” structural relationships among the facts and concepts in a new way.
7. Einstellung or problem set.

Applying Concepts to Instructional Settings

1. Classical conditioning addresses involuntary reactions including emotional reactions such as anxiety, fear, feelings of pleasantness and satisfaction. Thorndike’s connectionism addresses voluntary behaviors.

The teacher applying classical conditioning will seek to pair stimuli to elicit favorable emotional reactions to school events (stimuli). Applying Thorndike’s connectionism requires attention to forming bonds or connections between elements through reinforcement for appropriate responses. The teacher also should avoid forming bonds that later will have to be broken.

2. In mnemonics, using the letters in the word *face* to remember the notes in the spaces on the treble clef.
3. Teachers can announce activities that support student engagement and autonomy, such as (a) providing input on topics to be addressed that semester and (b) helping to construct rubrics for scoring student projects. To be effective, the teacher must follow through.
4. Thorndike found that training in particular tasks facilitated learning in similar tasks, but not those that were different. An example in music is learning to read music while learning to play the saxophone; those skills transfer to reading music for other instruments. Katona investigated the relationship between demonstrating the solutions to problems on subsequent problem solving and found that demonstrating major principles (which provided hints to the students) to be the most effective. An example is Wertheimer’s interaction with students who knew how to find the area of a rectangle, but did not know what to do when faced with a parallelogram. He asked them if their information about rectangles could be used in determining the area of a parallelogram. Students then restructured the parallelogram into a rectangle.
5. In any curriculum area, "senseless" learning is memorized information absent of context. Meaningful learning, from the Gestalt perspective, involves the re-organization of visual stimuli to form a new pattern.

Note to instructors: Determine if the curriculum areas represented by students in the classroom make use of visual stimuli.

6. Examples of arbitrary connections are a social security number, a license plate number, telephone area codes and zip codes. Meaningful connections include phonetic alphabets and examples of concepts (because the examples share characteristics).

Additional Discussion Questions

1. Classical conditioning was essentially stimulus substitution to evoke involuntary reactions to new stimuli. What are some examples of classical conditioning in everyday life?
2. What are some examples of classical conditioning in television commercials? (Note: This question is difficult for students; many tend to choose examples that represent modeling.)

Examples of correct answers for #2

- a. The “Snuggle” fabric softener bottle is paired with a teddy bear hugging a blanket (to elicit feelings of comfort and softness).
- b. White Cloud bath tissue is paired with soft white clouds (to elicit feelings of softness).

Homework Exercises

- I. Dr. Arnot, medical consultant for the CBS Morning Show, discussed “white coat hypertension” on September 23, 1991. The phenomenon is one of a temporary blood pressure rise that occurs when a patient enters the examining room. (The remainder of the time the blood pressure is normal).
 - A. Explain why this is an example of classical conditioning. (Hint: Elevated blood pressure is an indicator of what emotional reaction?)
 - B. Diagram this event according to the classical conditioning model.
- II. An advertising executive is planning a campaign to sell an expensive automobile to individuals in their 60s. He recalls his mother’s comment that a whiff of “Evening in Paris” cologne evoked sentimental feelings of her carefree high school days. He adds a “scratch and sniff” block with “Evening in Paris” to the full-page color ad for the car.
 - A. Diagram the associations in this scenario according to the classical conditioning model.
 - B. What is the advertising executive’s expectation as to the events in stage 3?

Answers to Homework Exercises

I. A. An elevated blood pressure, for some individuals, is an involuntary reaction to unfamiliar potentially threatening settings or situations.

B. Unfamiliar unpredictable situation —————▶ temporary elevation
a. in blood pressure

Unfamiliar unpredictable situation —————▶ temporary elevation
+ in blood pressure
Doctor's examining room

Doctor's examining room —————▶ temporary elevation
in blood pressure

II. A. "Evening in Paris" cologne —————▶ positive feelings of
enjoyment and pleasure

"Evening in Paris" cologne —————▶ positive feelings of
+ enjoyment and pleasure
color advertisement of car

color advertisement of car —————▶ positive feelings of
enjoyment and pleasure

B. The executive hopes that positive feelings evoked by the paired stimuli will lead to interest in the car.

CHAPTER 3: THE HUMAN BRAIN

Chapter Overview

The purpose of this chapter is threefold. One is to provide an overview of the organization of the human brain. The second purpose is to discuss the cognitive and educational issues related to brain research. Third is to discuss misapplications of some brain research, and the appropriate uses of brain imaging methods.

Answers to Chapter Questions

Understanding Concepts

1. The term “growth” in relation to the brain refers to the lengthening and branching of nerve fibers that connect the cell bodies of neurons to other neurons.
2. The “structural plasticity” view of the brain is supported by the bursts in synaptic development after birth followed by a reduction in synapses. This overproduction of synapses reduces the genetic load that would be necessary to reprogram the large number of synapses required to deal with the complexities of life. In other words, the number of genes is insufficient to determine the exact structure and location of billions of neurons and their synapses. Also, a brain “hard wired” from birth is able to execute only a limited number of operations and the brain would not be open to the social and cultural environment.
3. The subcortical structure of the brain are primarily involved in monitoring and maintaining important survival functions. The cortical structures primarily process and integrate different types of information or in solving problems.

CHAPTER 4: B. F. SKINNER'S OPERANT CONDITIONING

Chapter Overview

B. F. Skinner's operant conditioning is based on the principle that voluntary (not reflex) behaviors operate on the environment to produce consequences. The nature of some of these consequences (i.e., reinforcement) changes the organism in such a way that the behavior is repeated (learned). Components of learning include discriminative stimuli, responses, types of reinforcers, the timing of reinforcement, and the factors that influence the role of behavioral consequences.

Important in understanding reinforcement are the arrangement of events that differentiate positive and negative reinforcement (i.e., negative reinforcement involves the withdrawal or avoidance of the discriminatory stimulus), the emotional by-products of negative reinforcement, the differences between negative reinforcement and punishment, and the role of reinforcement in shaping.

Educational applications of operant conditioning include shaping social behaviors in the classroom, sequencing instruction to build repertoires of subject-matter responses and programming self-paced programs of instruction.

Student Misconceptions

Among the misconceptions students bring to a graduate course are (1) tendencies to attach "pleasant" and "unpleasant" to positive and negative reinforcement, (2) viewing negative reinforcement and punishment as interchangeable, and (3) tendencies to infer mental states as factors in behavioral change. Contributing to student misconceptions is the description of "positive punishment" and "negative punishment" found in some undergraduate textbooks. These terms are not components of operant conditioning and are not necessary to understanding the dynamics.

Answers to Chapter Questions

Understanding Concepts

1. Paying a fine for parking in a "no parking" zone is the removal of your money as an undesired consequence, therefore, it is negative punishment. Alternate response: Incurring a fine for parking in a "no parking" zone is the addition of a fine as an undesired consequence, therefore, it is positive punishment. Both answers are technically correct.

Paying one's taxes to avoid a fine is an example of a behavior executed to avoid a negative consequence, and is, therefore, negative reinforcement.

2. The concept of mastery, i.e., solving problems.

3. The concept of negative utility. This situation is an example of continuing reinforcement for a particular behavior that is to the long-term detriment of the individual.
4. iPods are another erosion of contingencies of reinforcement because entertaining events, such as music, are instantly available. Skinner maintained that easy access to reinforcing events reinforces only looking and listening, but not the kinds of behavior that can sustain the individual or society.
5. Opportunities to develop particular behaviors, such as practicing speech, through positive reinforcement from the adult.

Applying Concepts to Instructional Settings

1. To be effective, reinforcers should be given immediately and should be something novel and desired.
2. Possible reinforcers for the three types of students are:
 - a. Successful – Opportunity to work on one’s own; opportunity to select challenging tasks
 - b. Social – Opportunities to visit with peers; opportunities to help plan group social activities; also, possibly serving as a peer tutor
 - c. Dependent – Teacher attention and teacher approval
3. The teacher should seek to reinforce the dependent student when he or she is working on his or her own. Reinforcement also should be provided for steps taken by the student in assessing and regulating his/her own actions. In other words, encourage and reinforce independence and avoid reinforcing dependence.
4. The previous edition provided a list of possible responses:
 1. An emotional response
 2. A negative reinforcer
 3. A positive reinforcer
 4. A discriminative stimulus
 5. A punishment

Classroom/Homework Exercises

- I. The following excerpt is from the article “Token Rewards May Lead to Token Learning” by Frederic M. Levine & Geraldine Fasnacht, *American Psychologist* November, 1974, 816–820.

An impressive amount of data from attribution type research has accumulated which indicates that giving a reward can have an effect counter to that desired. The first author, while in his uncritical operant days, had the rare experience of watching his five-year-old son keep his room tidy for several days. In the best of operant tradition, the author gave his son a toy as a reward for tidiness. Not only was the room never voluntarily cleaned again, but a reward was demanded for many other once-routine responses: ‘Will I get a reward for giving you a hug, etc.?’ (p. 817).

- A. Analyzing the above situation in light of Skinner’s principles of operant conditioning, what are two major errors made by the father in giving the boy a reward?
- B. In the behavioral chain of events, for the boy, what function did the father’s reward fulfill? (S^D — Response — $S^{reinf.}$)

- II. John Rosemond, in an article entitled “Motivation Rewards Not Based on Reality” (newspaper column, September 15, 1991), describes the following situation to illustrate the ineffectiveness of the use of rewards to change behavior.

Suppose your job performance is poor and talks with your supervisor have failed to correct problems. You arrive late, fail to fill your quota or turn reports in on time, and often leave early.

One day the supervisor posts a chart and announces that you will receive a star in one of the 50 blocks for each day that you come in on time, turn in your reports, fill your quotas and stay until closing. When all the blocks are filled in with stars, you will be rewarded with a new car.

- A. State three of the principles of operant conditioning violated in the above situation.

Answers to Classroom/Homework Exercises

- I. A. The boy's behavior of cleaning up the room is already established. It had been strengthened previously through reinforcement (the scenario does not state the reinforcements). Therefore, no intervention was necessary.

The father ignored the contingency requirement of reinforcement. That is, the reinforcing consequence must be immediately contingent on execution of the appropriate behavior.

- B. In operant conditioning, reinforcing contingencies apply to specific behaviors (such as picking up one's toys), not for states such as "tidiness."

The father also seemed to be operating on the false assumption that only consequences that bring pleasure can serve as reinforcers.

The toy functions as the discriminative stimulus for the boy's verbal behavior of "Will I get a reward for giving you a hug?", etc.

- II. A. The situation as described is a contract between you and the employer and cannot result in behavioral change. The desired behaviors are simply being executed until the blocks are filled.

A star may or may not function as an effective reinforcer for an adult.

A consequence provided at the end of the day is not contingent on behavior.

CHAPTER 5: ROBERT GAGNÉ'S CONDITIONS OF LEARNING

Chapter Overview

Robert Gagné's conditions of learning began with the question, "What are the conditions responsible for developing expertise in real- world tasks?" Important in addressing this question were the diversity of types of tasks, and the importance of identifying categories of performance that are unique, independent of intelligence, age, classroom, grade level, and other situations.

The basis for identifying conditions of learning is the five distinct varieties or domains of learning. They differ in type of performance, type of assessment, and instructional requirements. Essential factors in learning are the internal conditions of learning (the learner's processing steps and internal states) and external conditions (instruction).

Complex learning in Gagné's theory is reflected in procedures (combinations of motor and intellectual skills) and learning hierarchies (sets of intellectual skills sequenced from simple to complex). Ideally, instructions should be developed according to the system model, which provides for feedback on the effectiveness of instruction and revision.

Student Misconceptions

Classroom teachers have become accustomed to the behavioral objectives developed for sets of curriculum materials. These objectives often are trite, highly specific behaviors and teachers have difficulty making the transition to Gagné's concept of capabilities. Students also often have difficulty differentiating verbal information and intellectual skills.

Answers to Chapter questions

Understanding Concepts

1. Verbal information requires only a meaningful context for learning whereas intellectual skills require interacting with symbols in various situations. The performance outcome for verbal information is simply the recall of the learned information whereas intellectual skills involve applying content at any of four skill levels from discrimination learning to rule learning.
2. It is the only domain that consists of a hierarchy of skills, each of which is a prerequisite to the next higher skill.
3. The potential trap is establishing a sequence of content items instead of intellectual skills.
4. In transfer of learning in Gagne's theory, the student applies the capability in new situations that were not a part of instruction. In this process, the student develops

specific cues about the contexts for which the skills are appropriate. From Skinner's perspective, use of the skill or capability comes under the control of stimuli that define the context or situations for which it is appropriate.

5. Designing a curriculum is a complex task and requires development at several levels, from broad curriculum goals to the events of instruction. The system design model provides procedures for addressing these levels, including formative and summative evaluation of the components.

Applying Concepts to Instructional Settings

1. A course in art appreciation requires teaching some content, such as the criteria applied to different types of painting, e.g., realism. Then the course should include the views of various art critics and the criteria they use to judge art, and culminate in the student choosing his or her own criteria and applying to various situations.
2. The key question is whether these programs are teaching pre-literacy and other skills prerequisite to capabilities taught in first grade.
3.
 - a. Concept learning
 - b. Problem solving (higher-order rule learning)
 - c. Attitudes
 - d. Problem solving (higher-order rule learning)
4. Two prerequisite skills for (b): (a) identifying appropriate components in computer commands in the particular language (BASIC, LOGO, PASCAL, etc.) and (b) identifying appropriate sequences of commands for a particular purpose (e.g., routing students with wrong answers back to the original question).

Two prerequisite skills for (d): (a) demonstrating proficiency in basic concepts in international trade, and (b) demonstrating proficiency in developing a logical argument.
5. The teacher is teaching higher-order rule learning (problem solving) as though the task were verbal information.

CHAPTER 6: COGNITIVE PERSPECTIVES

I. THE PROCESSING OF INFORMATION

Chapter Overview

This chapter discusses the basic processes in cognition, with an emphasis on those from information-processing theory. Various representations of the nature of human memory, including the ways that knowledge is stored, are discussed first. The components of knowledge discussed in the chapter parallel the information-processing model of apprehending information, preparing it for storage, and storing it in long-term memory. The components of learning, which include the role of learner knowledge and the organization of knowledge to be learned, are perception, encoding, and storage and retrieval. Strategies for encoding specific items and concepts, principles and ideas are discussed.

Components of instruction are structuring the framework for learning, facilitating learner perception and the encoding of information, and teaching student strategies for constructing meaning. Included are advance organizers, mnemonic techniques, summarizing and self-questioning. Guidelines for strategy instruction also are discussed.

Answers to Chapter Questions

Understanding Concepts

1. The sentences in set A include words that activate a particular schema.
2. Declarative knowledge consists of facts and descriptions of events, people, places, and other information. Procedural knowledge consists of how to implement different kinds of tasks from simple to complex.
3. Elaborative rehearsal is more effective because it establishes links to one's existing knowledge.
4. Accurate interpretations of words and phrases such as *however* and *in contrast* is an example of understanding signal words that provide information about the conceptual structure of text.
5. Inert knowledge is a problem in learning because it is the failure to activate relevant knowledge.

Applying Concepts to Instructional Settings

1. The information is not an advance organizer because it does not function as an umbrella, linking concepts in the new learning to the students' existing knowledge.

2.
 - a. Visual imagery elaborations include visualizing the arteries as elastic rubber bands covered with little “O’s” moving away from the heart. Veins are visualized as thin lines marked with “CO₂’s” moving in the direction of the heart.
 - b. The teacher might point out that oxygen-rich blood is bright red and blood containing carbon dioxide is bluish.
3. In mathematics and science, students can develop brief summaries of (1 – 3) paragraphs on famous individuals whose discoveries added to the field, e.g., Madame Curie. Others include writing a few paragraphs on the impact of some mathematical or scientific discovery on daily life, e.g., when the Romans discovered the Arabic numerical system, which includes zero, and replaced Roman numerals (no zero) in their trade and business calculations.
4. Each 5 x 8 card, if developed from different sources of information (textbook, class handouts, the Internet) can assist the student to construct a schema for the particular concepts. However, unless relations between concepts are addressed on the cards, further effort is needed to integrate similarities and differences between concepts into students’ schemas.
5. The concept of space aliens invading the earth is one that the students can relate to and it provides an analogy for the invasion of viruses on the human body, such as cold viruses, measles, and other diseases. The analogy is fine as far as it goes, but it does not address other important aspects of viruses.