

Chapter 2

Instructional Design for Multimedia and Theory of Learning Styles

INTRODUCTION

The effectiveness of any instructional programme or instructional material depends upon an appropriate planning or designing, what is called in professional parlance, “Instructional Design”. In general, instructional design is relatively a young discipline (Usha, 2003). In its literal meaning, instruction means a set of events that facilitate learning. On the other hand the word design is a generic term, which means “a creative model”. Instructional design includes several processes such as the use of knowledge, observation, and creativity to plan and create situations that enhance learning opportunities of the individuals. However, to accomplish the aforementioned processes, the instruction has to be planned to be effective and designed in some systematic approach. Learning theories have significant bearing on instructional design, as there is a logical development from learning to instruction (Usha, 2003). Instructional design optimizes learning outcomes while learning theories are the backbone of any instructional design. Instructional design is the articulation or the manifestation of the learning theories, and its main aim is to optimize learning by using the known theories of learning (Usha, 2003).

According to Strain (1994), a wide divergence of views exist among the researchers in instructional design concerning the relative contribution of various schools of psychology and claims that instructional

Table 1. Description of various learning theories

Category	Descriptions	Psychologists
Behaviorism	<ul style="list-style-type: none">• Research has been conducted on animals but is related to human behavior.• Based on observable changes in behavior which can be measured.• Learning results from the classical conditioning of simple reflexes.• Learning is the formation of a connection between stimulus and response.	John B. Watson Ivan Pavlov E.L. Thorndike B.F. Skinner
Cognitivism	<ul style="list-style-type: none">• Research related to human behavior.• Theory is based on the thought process behind the behavior.• Learning involves associations established through contiguity and repetition.• Stressed on the role of reinforcement which provides feed back about the correctness of responses.• Learning involves subsuming new materials to existing cognitive structure	Jean Piaget Lev Vygotsky Bruer Jerome David Ausubel
Constructivism	<ul style="list-style-type: none">• Learners construct their own perspective of the world, through individual experiences and scheme.• Learners construct their own knowledge. Learners are encouraged to search for other related relevant information.• Prepare the learner to problem solving ambiguous situations.	George Herbert Mead D. H. Jonassen D. N. Perkins

design has grown out of the systems approach with its roots firmly in behaviorists psychology that has dominated instructional design since the 1960s. However, Hannafin and Reiber (1989) pointed out that instructional design developed in the 1980s by Gagne, Merrill, Reigeluth and Scandura is largely due to the influence of cognitive theories of learning. Usha (2003) pointed out that the emphasis of instructional design has been on how information is retrieved, selected, processed and perceived. More recent developments are due to constructivist learning theories. Instructional designers no longer rely on any one theory. They draw upon and incorporate from various learning theories, mix those with other information and apply the results to meet human needs (van Patten, 1989).

This Chapter first describes some meanings, theories, models and learning styles followed by the students learning characteristics under study, instructional design and multimedia and then reports the results of a study designed to measure and more clearly define the value of these characteristics with relation to the selected undergraduate engineering subjects. Instructional design for multimedia is also discussed. The main purpose of this Chapter is to determine the major characteristics affecting student learning in order to incorporate these in the design and delivery of the TAPS packages. Students in today's undergraduate level classrooms often display widely varying characteristics that extremely affect learning outcome. Although student learning characteristics have been widely studied in the more traditional teaching and learning environments, educators have just begun exploring the applications in interactive multimedia and its associated technological techniques.

GENERAL THEORIES OF LEARNING

This section examines three general categories of learning namely, behaviorism, cognitivism and constructivism. These three categories of learning have implications for instructional design. A brief introduction to the three categories of learning is given in Table 1.

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