Chapter 27
Cognition and Learning

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ABSTRACT

Because of the failure of the behaviorist tradition in developing the full potential of the individual, there is a shift to a cognitive paradigm which emphasizes the process of learning as against methods of teaching. Each of us has the potential to excel if we have the right opportunities at the right time of our development and backed up with a stimulating environment in the process of learning. The effectiveness of any teaching learning process is measured by the extent to which it has met the individual's needs and expectations. The cognitive view of learning refers to individual's mode of thinking, remembering or problem-solving, because learners learn in different ways of absorbing information and demonstrating their knowledge. Individualized instruction is a personalized learning which meaningfully involves only the learner working on his own and at his own pace. On a practical level, a personalized learning environment entails flexibility to enable learners to interact with resources when it is most appropriate for them. There is awareness that many learners today are already creating personalized learning environments using digital resources. Without digital technology, meeting individual learner needs will be practically impossible. The implications of the introduction of technologies in homes and schools have created the problem of reinforcing the existing inequalities in the education system of the developed and developing countries. To arrest this situation, there is the need to ensure that access to digital resources is universal. Without a commitment to this goal, the learning landscape will be easily navigable only by those with the relevant economic and cultural resources. The present evolutionary trend in education technology has enhanced mass education making learning to be more individualized. Innovations in teaching and learning have thus been dominated by computer and the Internet.

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INTRODUCTION

The past three or four decades have witnessed tremendous growth in the body of research on teaching and learning. The invention of the microprocessor in the late sixties brought in the personal computer and electronic media which has necessitated this growth. Furthermore the advent of the World Wide Web brought instant dissemination of information enhancing research activities. This has resulted in a striking variety of approaches to study how people learn because the greatest challenge to educators in this era of information technology is how to make all learners with a variety of social and intellectual backgrounds benefit maximally from school. Thus, the search for different ways, means and techniques of identifying, developing and utilizing learners' potentials has pre-occupied educators and psychologists for many years. Researchers have also come to the realization that group research does provide valuable information about group characteristics, but has not taken cognizance of a particular child with a particular need. It is therefore not advisable to take a single study as a defining word. Efforts are converging from cognitive psychology, developmental psychology, social psychology, anthropology and neuroscience. In this chapter, a theoretical literature review on cognitive theory will be adopted with emphasis on the three important cognitive theories - *Piaget's cognitive development theory*, *Vygotsky's socio-cultural cognitive theory*, and the theory behind the *information processing approach*. They have the most complete descriptions of children's cognitive development (Santrock, 2003).

These cognitive theories, especially Piaget's and Vygotsky's, emphasize the individual's active construction of understanding, but did not give adequate attention to individual variations in cognitive development. The information processing approach, on the other hand, offers a detailed description of cognitive processes, thus complementing the missing link in understanding the extreme complex structure of mental abilities. The study of individual functioning will require new and different approaches to learning. This chapter will identify appropriate cognitive and instructional strategies that will enhance learning and increase the individual's performance, thus making him an able learner and not a disabled learner.

BACKGROUND

Cognitive Psychology

Cognitive psychology developed around the late 1950s when technology was developing *computers* capable of manipulating large amounts of data very rapidly. Over the last two decades cognitive psychology has been widely embraced because of the insights the theories have demonstrated in describing and explaining cognitive processes such as thinking and problem-solving. Cognitive theories deal with intrinsic motivation. Motivation serves to create intentions and goal seeking acts. Cognitive views of learning refer to an individual's mode of thinking, remembering, or problem-solving (Santrock, 2003). There is a tendency to behave in a certain manner known as mental models. Mental models are representations of reality that people use to understand specific phenomena. These models provide prediction and explanatory power for understanding the interaction. Cognitive psychology studies mental processes underlying behavior. It uses information processing as a framework for understanding the mind. Furthermore, cognitive psychology also makes and attempt at understanding the nature of mental representation that underline perception since most of the relationships that we establish with the environment are carried out through perception. Cognitive psychology is, therefore, the science that studies mental activities in terms of information processing (reasoning),