Chapter 1.22
Accessibility of Technology in Higher Education

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INTRODUCTION

In systems thinking divisions apparent in science specializations are seen "as arbitrary and man made" (Checkland, 1981, p. 4). A key idea embedded in systems theory is that it can assist us in understanding of phenomena and that its holistic emphasis will promote orderly thinking. According to Checkland (1981), there are natural systems, designed systems, abstract systems, and human activity systems (p. 112). Human activity systems can be broken down into examples of open systems that are relationship dependent. Change is inherent in human systems, as the intricacy of the relationships in these kinds of systems require continuous adaptations if the system is to remain stable. Checkland viewed human activity systems as wholes that are emphasized by the existence of other systems.

Checkland (1981) called systems theory a metadiscipline because of its emphasis on holistic thinking. While "Descartes taught the Western world to break things apart," systems thinking required one to look at things from the opposite end. Thus, "systems thinking is about the framework itself," and it is an apt theory and manner of thinking to use when looking at a variety of kinds of systems (Checkland, 1981, p. 12). Two themes flow through systems thinking: (a) emergence and hierarchy, and (b) communication and control (Checkland, 1981, p. 75).

Kuhn (1974) declared that there are just two kinds of controlled systems "all living things, and controlled systems made by living things" (p. 69). Business, industry, government, and education systems are human creations; such social systems are created in direct response to meet their own needs and requirements, and the system created must meet, satisfy, and determine how it will attain its goals. System components then carry out, transform, and integrate the goal relationships into patterns of interaction and interdependence, and the process and interaction of the system created becomes whole and evolves into something that cannot be divided (Banathy, 1973). Churchman and Ackoff (1949 in Emery, 1973) alleged that when something has value in a social system, one can look across periods of

time, see an increase in the pursuit of the system value, and observe an increased desire to achieve the system value (p. 20).

SHIFTS IN THINKING

Over the past 30-some years in the United States, shifts in thought regarding the use and value of information technology and new perspectives in relation to persons with disabilities and their ability to participate in key areas of human social interaction—such as work, citizenship, education, and independent living—have taken place. This chapter will explore changes to the education system brought about by the changes in viewpoint connected to the use of information technologies in education and educating persons with disabilities.

Technology has been a constant in the change process for education systems. Assimov (1991) outlined how technology has driven history and pointed to increases in literacy, advances made during the scientific and industrial revolutions, and the advances in 21st century information technology as evidence of technology as a change agent in history. Information technology's place in history as a change agent is well documented, as is its impact on society, change, and is evident in the increased use, acceptance, and integration in today's education system.

Research connected to the use of technology has flooded literature connected to teaching and learning. There are numerous professional organizations such as the Association for Educational Communications and Technology (AECT), American Library Association (ALA), American Society for Training and Development (ASTD), International Interactive Communications Society (IICS), International Society for Performance Improvement (ISPI), International Society for Technology in Education (ISTE), Media Communications Association International (MCAI), International Visual Literacy Association (ILVA), and the United States Distance Learning Association (USDLA) dedicated to the advancement of education technology. Increasingly, computer and Internet technologies focused on its use in education have found a home in specialty journals such as *Electronic Learning, Technology and Learning,* and the *Journal of Educational Multimedia and Hypermedia,* to name a few (Heinich, Molenda, Russell, & Smalldino, 2002, pp. 320-322). According to Roblyer and Edwards (2000), "Technology is us—our tool, our methods, and our own creative attempts to solve problems in our environment" (p. v).

EDUCATION AS A SOCIAL SYSTEM

The history of agricultural and industrialized-based education systems of the 20th century depicts many system changes, and our 21st century education system is undergoing another metamorphosis. Bandura (1995) stated that the current technological era has "profound implications for educational systems" (p. 17). Along with the technological changes occurring in education systems, Bandura pointed to a social system of change and declared, "As countries become more ethnically diverse, educational systems face the difficult challenge of fulfilling their mission with students of diverse backgrounds and inadequacy of academic preparation" (p. 21). Ongoing battles will be fought over whether educators should adopt assimilationist or multicultural approaches…" in the American educational systems operating within what he termed "sociopolitical contexts" (Bandura, 1995, p. 22).

Education is an activity of social systems that processes people and affects their mental state (Luhmann, in Vanderstraeten, 2000). It is an "intentional system" that exists to move people through organized learning based on context of grade level, ability, and prior learning experiences of the individuals moving through the system (p. 7). Education systems create opportunities for