Chapter 10
Extended Assistive Technology:
The Impact of Interactivity of Human-Computer Interfaces on Independence, Employment, and Organizations

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ABSTRACT

The purpose of this chapter is to analyze the history of technology and its founding purposes. The evolution of technology resulted in the creation and development of assistive technology. The impact of interactivity of human-computer interfaces on independence, employment, and organizations is analyzed and addressed in relations to disabilities. The utilization of assistive technology, in the disabled community, as well as in relations to the independence of the disabled are covered via the paradigms of assistive technology trainer and job developer for the disabled in the United States of America—capital of technology—Google, Yahoo, Microsoft, Cisco Systems—and capital of assistive technology.

INTRODUCTION

Tran (2014) states that technology can be interpreted as being a nonrival good: in economics a good is considered to be nonrival if its consumption or use by one individual makes it use by someone else no less difficult (Pindyck & Rubinfeld, 2001). However, before the advent of modern societies, technology was probably also a nonexcludable good: a good is considered to be nonexcludable if its use by one individual who has not paid for it is ineluctable (Pindyck & Rubinfeld, 2001). Goods that are both nonrival and nonexcludable are called public goods (Pindyck & Rubinfeld, 2001). For most of human evolution, technology was probably a public good.

Technology produced by one individual could easily be copied and used by others. Due to the fact that technology is usually costlier to produce, in terms of time and energy, than to copy or imitate (Tran, 2014), the interaction between the individuals in a population producing and using technology can be regarded as a producer/scrounger game. In this game, the individuals of one type, the scroungers, make

DOI: 10.4018/978-1-5225-0034-6.ch010

use of the behavioral investment of individuals of another type, the producers (Barnard & Sibly, 1981; Giraldeau, Caraco, & Valone, 1994). More often than not, the technology developed by producers might be copied by scroungers, thus interaction between the two can also usefully be regarded as an individual/social learner interaction.

Here, Tran (2014) states the individuals of one type, the social learners, copy or imitate the behaviors or artifacts that have been generated by the other type, the individual learners, through trial-and-error learning, insight, or deduction (Boyd & Richerson, 1995; Enquist & Ghirlanda, 2007; Rogers, 1988; Stephens, 1991; Wakano, Aoki, & Feldman, 2004). The evolution of technology, and the origins of economic growth, can thus be framed in terms of the producers/scroungers game, as well as in terms of the coevolution of individual learning and cultural transmission, in which technology can be regarded as a suite of cultural practices. Throughout human evolution, technology is also likely to have increased the vital rates of individuals, that is, it is adaptive. However, technology may become maladaptive, and decrease the vital rates of individuals using it (Tran, 2014).

As such, the purpose of this chapter is to delve into the focus and purpose of human-computer interaction (HCI) in relations to disability, and how HCI plays a part in people with disability. In so doing, this chapter will begin with the coverage of the relationship between assistive technology and human-computer interaction. The chapter will then cover human-computer interaction, the history of human-computer interaction, the history of adaptive automation, the history of assistive technology, the history of disability, human-computer interaction in relations to disability (independence and employment), and the evolution of human-computer interaction in relations to disability. The chapter will conclude with the status of human-computer interaction as technology advances with time.

DISABILITY

The experience of stigma is common among human beings (Crandall, 2000). As noted by Crocker, Major and Steele (1998), "A person who is stigmatized is a person whose social identity, or membership is some social category, calls into question his or her humanity—the person is devalued, spoiled, or flawed in the eyes of others" (p. 504). All persons, according to Parette and Scherer (2004), have experienced some degree of stigmatization at some point in their lives, whether it is feelings of isolation, alienation, exclusion, or embarrassment resulting from being different in some way. References to the phenomenon of stigmatization of individuals having disabilities may be found throughout the extant literature (Barker, 1948; Fine & Asch, 1988; Goffman, 1963; Gray & Hahn, 1997; Jones, Farina, Hastorf, Markus, Miller, & Scott, 1984). For persons with developmental disabilities, stigmatization is often a reality having varying effects, including, but not limited to:

1. Less than ideal treatment (Crocker et al., 1998);
2. Disrupted social relations (Goffman);
3. Person avoidance, anxiety, and depression (Crandall & Coleman, 1992); and
4. A distorted self-image and resulting poor self-esteem (Wright, 1983).

Some people may even attempt to hide their developmental disabilities from others to avoid the stigma (de Torres, 2002; Liu, 2001; Lopez-De Fede & Haeussler-Fior, 2002; Miller, 2002; Napier-Tibere, 2002; Pinto & Sahu, 2001). Stigmatization has also been suggested to be associated with assistive technology

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Kenneth David Strangand Narasimha Rao Vajjhala (2023). *International Journal of Curriculum Development and Learning Measurement (pp. 1-24).*
www.irma-international.org/article/empirical-study-of-exporting-a-university-curriculum/318120