

Chapter 11

Assistive Technology: Impact on Independence, Employment, and Organizations for the Motor Disabled

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ABSTRACT

The purpose of this chapter is to analyze the history of motor disabled assistive technology. Specifically, this chapter will cover motor disability and the history of assistive technology related to motor disability. As such, this chapter will also include the evolution of technology and its components, resulting in the creation and development of assistive technology. Assistive technology will be defined and analyzed, the history of disabilities will be covered, and the history of motor disability will be discussed. Reasonable accommodations, based on the Americans with Disabilities Act (ADA), in relations to the utilization of assistive technology, in the disabled community, as well as in relations to the independence of the disabled will be covered via the paradigms of assistive technology trainer and job developer for the disabled in the United States of America—capital of technology—Google, Inc., Yahoo! Inc., Microsoft Corporation, Cisco Systems, Inc.—and capital of assistive technology.

INTRODUCTION

Technology can be interpreted as being a non-rival 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, human evolution technology was probably a public good.

The technology produced by one individual could easily be copied and used by others in the population. Due to the fact that technology is probably costlier to produce, in terms of time and energy, than to copy or imitate, 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 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

DOI: 10.4018/978-1-4666-4438-0.ch011

between the two can also usefully be regarded as an individual/social learner interaction.

Here, 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. But technology may become maladaptive, and decrease the vital rates of individuals using it. The suite of cultural practices carried by the individuals in a population, therefore, may involve both adaptive and maladaptive components (Boyd & Richerson, 1985; Diamond, 2005; Enquist & Ghirlanda, 2007). As such, producers of technology (individual learners) not only produce adaptive cultural traits but, as a byproduct, may generate maladaptive traits, which may be copied or imitated by scroungers (social learners).

The impact of adaptive and maladaptive cultural traits on human evolution has been repeatedly stressed (Boyd & Richerson, 1985; Cavalli-Sforza & Feldman, 1981; Lumsden & Wilson, 1981; Richerson & Boyd, 2005) but its cumulative nature has virtually never been taken explicitly into account in evolutionary models of cultural transmission. Further, the feedback of cultural adaptations and maladaptation on population dynamics is also very likely to have affected human demography (Diamond, 1997, 2005; Tainter, 1988) but this also has rarely been analyzed in an evolutionary context. There is a clear lack of quantitative theory in this area and a need to gain a better understanding of how the evolutionary dynamics drives the

accumulation of culture, and how this feeds back on population demography. This gap has started to be filled with the construction of macro-level models for cumulative cultural dynamics (Enquist, Ghirlanda, Jarrick, & Wachtmeister, 2008; Enquist & Ghirlanda, 2007; Ghirlanda & Enquist, 2007).

The purpose of this chapter is to analyze the history of technology and its founding purposes. Through the evolution of technology, and its components, resulted in the creation and development of assistive technology. Assistive technology will be defined and analyzed, and misconceptions, misunderstandings, and negative connotations will be 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 will be 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.

A BRIEF HISTORY OF DISABILITY

Disability encompasses most physical and mental conditions that affect ability or are perceived by others as affecting ability. This includes conditions that are visible and those that cannot be seen. Disability includes intellectual impairments and learning disorders. As such, a large number of competing theories concerning the nature of learning disabilities has left the field with no universally accepted definition. The present legal definition, accepted by most school practitioner, as stated in the Education for All Handicapped Children Act of 1975 (Public Law 94-142), rules out all known causes of learning disorders except neurological impairment. As such, the term learning disability and the term disability are commonly used interchangeable as an umbrella term, when referring to disability.

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