Chapter 80
A Human Factors View of the Digital Divide

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ABSTRACT

This chapter addresses a problem that centers on the persistent disparities in computer use and access among citizens of varying cultural backgrounds. The chapter begins with discussion about the digital divide among ethnic minorities, particularly African-Americans and Hispanic-Americans (Latinos), in the United States. This chapter defines "access" as having a computer interface that facilitates user learning. One proposed human factors intervention for this problem of access is in recognizing and accounting for culture's influence on cognition. This discussion is grounded in the development and employment of computer interface metaphor designs that are culturally valid for target user groups. We also provide examples of challenges that users may encounter when inappropriate interface metaphor are built into a computer interface design. Finally, the chapter highlights various human factors interventions and considerations that will provide a pathway to achieving greater levels of e-inclusivity and for providing citizens with equitable access to information.

INTRODUCTION

Our global society is becoming increasingly reliant upon electronic access to information. It is vital to provide the masses with access to computer and Internet technologies. In the mid-nineties the issue of the digital divide surfaced, as the Internet became a major communication medium in the United States. National investigations were conducted to assess the breadth of this divide. One of the more recent investigations identifies two groups, African-Americans and Hispanic-Americans (Latinos), as lacking access to the Internet (Lenhart, 2003). Lenhart reports that even when

income is held constant, African-Americans still access the Internet less than Whites. These reports provide clear examples of cultural groups within the United States that have experienced a reduction in access to knowledge that is made readily available to other portions of the information society.

The term "access" maintains a dual meaning. The most common use of the word "access" concerns the availability of computer hardware and Internet connectivity. Smith-Jackson and Williges (2001) define "access" as having a computer interface that effectively facilitates user learning. It is the latter definition of "access" that has been adopted for the purpose of this chapter's discussion, because it is aligned with the discipline of human factors. Human Factors integrates engineering and psychology to design and evaluate systems that are compatible with users' capabilities. A human factors view of the digital divide perceives access as a successful interaction between humans and machines such that humans receive the intended benefits of the system. Poor design or design biases can lead to access inequity. Access inequity is viewed as a failure in design if the intended users are diverse.

Despite the aforementioned inequities in access, our society is becoming progressively more information driven. Individuals who lack access because of design biases will continue to be disenfranchised and will ultimately suffer losses in various aspects of quality-of-life. For example, those who lack access will not garner equitable opportunities for jobs, internet-based economic empowerment, civic engagement, healthcare, web-based education and simple day-to-day activities. A lack of access to computer interface designs that facilitate user learning, for this discussion, is central to the human factors perspective presented here. Thus, the barrier that must be overcome to achieve greater rates of access among ethnic minorities and other groups is to use inclusive design to avoid marginalizing user groups through the computer interface design process.

One intervention to address this barrier to access, from a human factors perspective, is to recognize and account for the influence of culture on cognition. Chapanis states, "Human factors discovers and applies information about human behavior, abilities, limitations, and other characteristics to the design of tools, machines, systems, tasks, jobs, and environments for productive, safe, comfortable, and effective human use" (1985, p. 2). Cognitive activities, as well as the physical activities are evaluated to determine compatibility with users needs and capabilities. The human factors approach to product assessment would also describe the influence of culture on an individual's cognitive processing and decision-making while interacting with the product. Product assessment occurs during the product development cycle and after the product is completed.

In this chapter, it is proposed that ethnic minorities in the United States choose to use computers and connect to the Internet at lower rates because the interfaces that are available in the form of computer software and the Internet do not appeal to their design needs and preferences. The focal point of this chapter is to addresses the issue of the enduring inequity in computer and Internet access among ethnic minorities, particularly those who are economically underserved, and mainstream Americans. While the catalyst for this discussion is a problem defined within the United States, the design implications that emerge for development of culturally and socially valid computer interfaces will facilitate global design efforts as well.

We will focus on five main areas to demonstrate how human factors can be applied to the digital divide to increase the rate of access by ethnic minorities. The areas of focus are:

(a) To examine the intersection between digital divide phenomena and interface design,
(b) To discuss known psychological theories relevant to cultural groups and the implications of these theories as they relate to the digital divide,

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