

Effects of Socio-Economic Status on Interface Metaphor Use and Computer Performance

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Considering the rapid movement of the United States and other countries towards an information society, it is of great importance to provide the masses with access to computer technology and its ever-growing benefits. In many cases, “access” means having the actual technology (computer hardware); other times “access” involves the designing of the computer interface so that the user can effectively learn to use it. This research addresses a problem that centers on the fact that apparent disparities persist in computer use/access among racial minorities, persons of lower economic status and lower education here in the United States [1; 2; 3; 4]. As our nation becomes progressively more information driven, the people (all people) need to have access to tools that will help them to exploit the use of the information provided. Individuals who lack access will be at a great social and economic disadvantage.

There may be various interventions and solutions that can and should be used to dismantle the problem existing between the technology “haves” and “have-nots.” However, one aspect of the problem could be associated with culture and its influence on cognition. Therefore, one solution may involve computer design interventions that take the influence of culture on cognition into account. For example, Nesbitt and Norenzayan [5] report that cultural practices and cognitive processes are tied together. They also state that those cultural practices in turn guide certain kinds of cognitive processes. Nesbitt and Norenzayan [5] further specify that cultural schema and cultural models are produced within a cultural group. Cultural models are event schema that appropriately connect people with events, the social roles that they play, the objects they use, and the order of actions that they take. These models are the tools that individuals in cultural groups use to moderate how they function, perform rituals, and play games [5].

There are many racial and ethnic cultures represented in the United States. Beyond the racial and ethnic cultures are those cultures defined by one’s socio-economic status. One could project that those differences in culture should be a consideration for building effective computer interface designs. A method to address the issue of cultural differences, and facilitate

learning among users, is to select appropriate computer interface metaphors for a given cultural group. Interface metaphors provide the benefit of user familiarity [6]. These metaphors assist users in their expectations and predictions of computer system behavior or functionality [6]. Interface metaphors allow the user to exploit their current knowledge of other areas when learning how to use a computer [7]. The most common example of an interface metaphor is the “desktop” metaphor, which is the primary interface model for desktop/personal computing. Accordingly, this research will explore computer interface metaphors as they relate to the economically underserved in comparison to cultures that are more economically affluent.

In addition to exploring various computer interface metaphors, two other factors will be investigated: visual spatial ability [8] and computer related self-efficacy [9], which are known to influence computer performance. Perceived self-efficacy is defined as an individual’s belief about his or her capabilities to achieve designated levels of performance that have influence over events that affect his or her life. Self-efficacy beliefs mediate how people feel, think, motivate themselves and behave [10]. Investigation of these two factors shall provide information concerning individual differences among computer users of low socio-economic status. Collection of individual differences data will provide insight into questions such as: (1) ‘is there a substantial relationship between spatial ability, computer related self-efficacy and computer interface metaphor preference among the economically underserved?’ and (2) ‘which factors, if any, significantly contribute to determining performance using an individual’s preference for a computer interface metaphor?’

In order to address the research questions, both qualitative and quantitative methods will be employed. First, focus groups, with content analysis, will be used to obtain different ideas and concepts that would be appropriate to use as computer interface metaphors. Multiple regression models will be used to give answers to the questions concerning individual differences. The first projected outcome for this research is a set of metaphors that would appropriately assist the

economically underserved as they learn to use computer systems. The second projected outcome will include two regression models. The first regression model will determine which individual factors (computer related self-efficacy and spatial abilities) influence an individual's preference for an interface metaphor. The second regression model will show which, if any, individual factors (interface metaphor preference, computer related self-efficacy, and spatial abilities) predict an individual's performance on a computer system utilizing their preferred interface metaphor.

Furthermore, the overall purpose of this research is to (1) determine a set of appropriate computer interface metaphors for the economically underserved, (2) determine if there are significant differences in performance when individuals of one culture are tested on computer systems that use a computer interface metaphor(s) recommended by another culture, (3) determine if there is a substantial relationship between spatial ability, computer related self-efficacy and computer interface metaphor preference among the economically underserved, and (4) determine which factors, if any, significantly contribute to determining performance using an individual's preference for a computer interface metaphor.

Finally, it is critically important to examine and study users of all kinds, and consider the affects of individual differences on performance with various computer interface designs. This area of research will add to human computer interaction by determining a design method to extend computer technology to an even broader base of American users. Furthermore, the results of this research may provide some headway into expanding computer (or information) technology to individuals of low socio-economic status.

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