

Chapter 9

Internet Technology Levels in a Higher Education Teaching and Learning Environment: Discriminant Function Analysis Approach

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ABSTRACT

The authors of this study utilized the discriminant function analysis using extreme student groups (top and bottom quartiles) defined by students' internet technology scores to develop a model that best predicts group membership of the low and high internet technology levels among college students. The sample for the study was drawn from a Midwestern doctoral university and consisted of a random sample of senior year undergraduate students ($n = 537$). The instrument for the study used items from a 2000 College Student Survey (HERI, 2000). The response format for most instrument subscale items used in this study was of the Likert-type. Results of the discriminant analysis showed that students' classification into low or high internet technology groups based on the institutional, behavioral, and personality variables can accurately be done. The lowest total percent correctly classified was at 72% while the highest total percent correctly classified was 74%. The variables that made significant differences included: student faculty interaction, student support services, quality of instruction and college experience, interpersonal relations and leadership, and student extra effort in learning.

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INTRODUCTION

Use of microcomputers in the United States has increased steadily since their introduction in the 1980s. Since the early 1990s, the internet community has grown exponentially, doubling every 5 to 6 months (Picciano, 2006). According to Newburger (2001), statistics indicated that 18 million children between the ages of 3 and 17 (nearly 65% of all children in the United States) live in a household with a computer. This figure was up 50% since 1998. In 1998, 19% of all children had used the internet at home, and this figure increased to 30% in 2000 (Newburger, 2001).

While many college classes incorporate some degree of computer use in their curriculum, it is typically classes that focus specifically on computer use that most often offer or require computer laboratory sessions. Traditional college classes that emphasize the use of computers in their curriculum typically use a combination of lecture and computer laboratory sections (Newby & Fisher, 2000). Introductory courses in computer technology in education generally provide an overview of information processing concepts that may include the role of computers in education and business, the components of a computer system and electronic information, and computer communications. In addition to information processing concepts, introductory courses may include software application instruction and how technology hardware and software are integrated into the curriculum. Various college departments may offer a third category of classes, software applications. The most common of these focus instruction on a productivity suite such as Microsoft Office or Lotus. Some departments offer instruction in web editors, graphic design, multimedia production, and other software applications.

FRAMEWORK

There has been increasing interest in the use of internet technology to augment traditional teaching techniques, and this increasing interest is not surprising and may be considered inevitable as the

delivery of instruction lends itself to a system of mass higher education (Maye, 1998). For instance, Web-enhanced learning is certainly an option that offers instructors a range of advantages, such as providing feedback with relative ease and, thus, providing a more flexible pace of learning while reaching a wider and more diverse audience (Collis, De-Boer, & Slotman, 2001; Hoskins & Van Hooff, 2005; Hoskins, Newstead, & Dennis, 1997). Plous (2000) and Ward and Newlands (1998) note that with access to computer and internet resources, wider markets of learners are harnessed.

With computer resources, learners are provided with the opportunity and reason to interface with computers on a regular basis. Further, library resources are largely retrievable online and students do not have to be in a physical location like a library facility to be able to access most research articles and technical research reports. With advanced computer technology and library online databases, doing research has been made much easier for learners. Further, with computer resources, learners can improve their computer literacy, which is a critical component for the employment market of the future (Heinssen, Glass, & Knight, 1987; Miura, 1987).

Literature is replete with studies that highlight the benefits of web-based learning. Most of these studies indicate that the use of educational technology affords students greater anonymity and opportunities to practice a range of generic skills (for instance, management of self, others, task, and information) (Howe, 1998; Oliver & McLoughlin, 2001). Further, through online technologies, learners can profit from an interactive and engaging environment with a range of learning scaffolds and supports thus enabling them to broaden and make sense of their experience (Hammond & Trapp, 2001; Krantz & Eagly, 1996).

Purpose of the Study and Research Questions

The purpose of this study was to determine whether a model exists that significantly increased the researchers' ability to accurately classify the low and

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