Online Learning

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INTRODUCTION

By looking closely at the term *online learning*, we could arrive at a simple definition, which could be the use by students of connected (online) computers to participate in educational activities (learning). While this definition is technically correct, it fails to explain the full range and use of connected computers in the classroom. Historically, the term appears to have evolved as new information and communication tools have been developed and deployed. For example, in the early stages of development, Radford, (1997) used the term *online learning* to denote material that was accessible via a computer using networks or telecommunications rather than material accessed on paper or other non-networked media. Chang and Fisher (1999) described a Web-based learning environment as consisting of digitally formatted content resources and communication devices to allow interaction. Zhu and McKnight (2001) described online instruction as any formal educational process in which the instruction occurs when the learner and the instructor are not in the same place and Internet technology is used to provide a communication link among the instructor and students. Chin and Ng Kon (2003) identified eight dimensions that constructed an e-learning framework. The range of definitions of online learning is not only a reflection of technological advancement but also a reflection of the variety of ways educationalists at all levels use connected computers in learning.

BACKGROUND

Examples of Online Learning Activities

In one learning scenario, a group of 10-year-old students following a pre-prepared unit in a supervised computer laboratory may use the information storage capacity of the World Wide Web (WWW) to gather additional resources to prepare a presentation on weather patterns. In a second scenario, a group of 14-year-olds studying the same topic in a classroom with a dedicated computer work station situated by the teacher's desk could use the communicative functions of the Internet to establish mail lists with metrological staff to follow studies being undertaken on weather patterns in a region. In a third scenario, a group of 18-year-olds consisting of small pockets of learners in isolated locations using home-based connected workstations may use an educational courseware package, incorporating information storage and communicative functions to participate in a complete distance unit, studying impacts and implications of climate change. In each of the scenarios described, students and teachers have used connected computers in distinct ways to achieve varied objectives. The technical competencies required, the learning support provided, and the physical location of the students in each scenario is different and distinct. In each scenario, a definable learning environment can be identified for each group of learners.

LEVELS OF ONLINE LEARNING

Educational institutions, from elementary schools to universities, are using the WWW and the Internet in a variety of ways. For example, institutions may establish simple Web sites that provide potential students with information on staff roles and responsibilities; physical resources and layout of the institution; past, present, and upcoming events; and a range of policy documents. Other institutions may use a range of Web-based applications such as e-mail, file storage, and exams to make available separate course units or entire programs to a global market (Bonk, 2001; Bonk et al., 1999). To classify levels of Web integration that are educational in nature, we should look closely at the uses of the Web for learning. Online educationalists have identified a

number of different forms of online instruction, including sharing information on a Web site, communicating one-to-one or one-to-many via e-mail, delivering library resources via the Internet (e.g., electronic databases), or submitting assignments electronically (e.g., e-mail attachments, message board postings) (Dalziel, 2003; Ho & Tabata, 2001; Rata Skudder et al., 2003; Zhu & McKnight, 2001). However, the range of possibilities highlighted by these educationalists does not fully identify, explain, or describe the interactions, the teaching, or the learning that occurs within these environments. For best practice guidelines to be created for e-environments, the common features and activities of the Internet or computer-connected courses affecting all students, regardless of Web tools used or how information is structured and stored, need to be identified and described.

LEARNING ENVIRONMENTS

In researching and evaluating the success or failure of time spent in educational settings, researchers could use a number of quantitative measures, such as grades allocated or total number of credits earned, participation rate in activities, graduation rate, standardized test scores, proficiency in subjects, and other valued learning outcomes (Dean, 1998; Fraser & Fisher, 1994). However, these measures are somewhat limited and cannot provide a full picture of the education process (Fraser, 1998, 2001). There are other measures that can be used that are just as effective; for example, student and teacher impressions of the environment in which they operate are vital. The investigation in and of learning environments has its roots nourished by the Lewinian formula, $B=f(P,E)$. This formula identifies that behavior (B) is considered to be a function of (*f*), the person (P), and the environment (E). It recognizes that both the environment and its interaction with personal characteristics of the individual are potent determinants of human behavior (Fraser, 1998).

PERCEPTUAL MEASURES

In the past, it has been common to use pencil and paper forms with the administrator supervising data entry in learning environment research (Fisher & Fraser, 1990; Fraser et al., 1992; Fraser & Walberg, 1995). Instruments are carefully designed and ask students to select an appropriate response from a range of options. For example, the Science Laboratory Environment Inventory (SLEI) begins by providing students with directions on how to complete the questionnaire. They are informed that the form is designed to gauge opinion and that there is no right or wrong answers. Students are asked to think about a statement and draw a circle around a numbered response. The range of responses is from 1 to 5, and the meaning of each response is explained carefully; for example, 1 is that the practice takes place almost never, while 5 indicates the practice occurs very often (Fraser & Fisher, 1994; Fraser & Tobin, 1998). Data are analyzed by obtaining a total score for a specific scale. This scoring is often completed manually. Advancements in computer technologies have made it possible to explore the disposal of paper-and-pencil instruments and manual data entry. Increasingly, traditional instruments are being replaced by electronic versions delivered through the Internet (Maor, 2000; Joiner et al., 2002; Walker, 2002).

FUTURE TRENDS

Setting the Scene

Three connected computer- or WWW-based educational activities on the weather were described in section one. The first scenario illustrated how the information storage and retrieval functions of the WWW could be used to expand available student resources. In this scenario, students could be supervised directly and assisted in their tasks by a teacher responsible for a dedicated computer suite established at the school. The second scenario demonstrated how the communication features of connected computers could be used to provide authentic examples to enrich student understanding. In this scenario, students could work independently of the teacher, who was present, however, to offer guidance and support. The third scenario described how Web-based educational management platforms could be used to provide educational opportunities for isolated pockets of students. In this scenario, stu-