

Multimedia Integration in Active Online Learning Environments

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INTRODUCTION

The terms distance learning, online learning, and Web-based instruction have become buzzwords and catch phrases for the new phenomenon of learning. These terms used to describe an ever-changing environment represent approaches that focus on opening the access to education and training provision for adult learners, freeing the adult learners from the traditional constraints of time and place. Online learning is one of the most rapidly growing fields of education around the world, and its potential impact on all education delivery systems has been greatly emphasized through the development of Web-based information technologies, multimedia, communication technologies, and, more importantly, the Internet.

Online and Web-based courses within the distance education environment have become popular with both students and educational institutions as the new mediums to deliver educational programs. For universities and other educational programs, they are an excellent way to reach students in diverse and distant locations. Some may also be used to supplement school enrollments since students can conceivably be anywhere and take the courses. Given their popularity and increased use, it is imperative that administrators and instructors monitor students' perceptions of courses using these mediums for delivery. Hopefully, this type of feedback can help in modifying and improving the learning environment and education programs so that course can function as desired by all parties.

With these concepts in mind, the purpose of this chapter is to identify the factors that contribute to the understanding, capabilities, limitations, and applications of multimedia in online courses. The information presented in this chapter will lead to the development and implementation of innovative strategies to promote quality teaching and student learning via the online and medium with multimedia. In order to effectively

develop a conducive online course environment for the learner, instructional designers, educators, trainers, and facilitators must pay particular attention to the design of instruction, the mode of delivery, and the multimedia technologies employed to disseminate course content and materials to students. With this understanding, then and only then can we begin to harness the power of online learning with multimedia.

BACKGROUND AND LITERATURE REVIEW

Online courses with multimedia have the potential to generate new patterns of teaching and learning for students. This idea is strongly linked with developments in information and communication technologies; it is also close to the development of new learning needs and new patterns of information access and application and learning. There is evidence that online courses and advanced in multimedia technology can lead to innovation in mainstream education, and may even have effects beyond the realm of education itself. Multimedia and online courses therefore may play a decisive role in the creation of the global knowledge-based society (Michael & Tait, 2002).

In education, multimedia tools are used to create stimulating and interactive online education that incorporate audio, video, and animation capabilities. The definition of multimedia has changed over time. According to Ryan and Kasturi (2002), multimedia is defined as the combination of text, graphics, sound, animation, and video with computing technology to provide the user with a multisensory experience. Mayer (2001) states that multimedia are tools or products that utilize computer technology to enable the production, manipulation, and exchange of informative and educational materials to the user. Reed (2003) explained how teachers and students are able to take advantage

of multimedia technology to access digital media such as audio, video, and data via the Internet. Walsh and Reese (1995) also discussed the growing popularity of video conferencing via compressed digital video technology. This technology has shown to provide students at different campuses access to live interactive course materials and content.

The impact of multimedia on learning is still a controversial issue. Both quantitative and qualitative studies report positive ideas concerning multimedia-based instruction and its impact on student academic achievement. The effective use of this technology may or may not affect the student's achievement in online courses (Ryan & Kasturi, 2002; Mayer, 2001; Reed, 2003; Vogt, Kumrow, & Kazlauskas, 2001). According to these studies (Ryan & Kasturi, 2002; Mayer, 2001; Reed, 2003; Vogt et al., 2001; Roblyer, 2006; Shelly, Cashman, Gunter, & Gunter, 2004), multimedia components, such as graphics, audio, digital animation, and video, can be integrated into the online courses environment to enhance, engage, and extend the students' ability in understanding course content and materials. An example of this phenomenon can be derived from a study conducted by Mayer (2001), discovering a link between the students ability to understand the course content and motivation to advance further in an online course. From studies conducted by Roblyer (2006) and Shelly, Cashman, Gunter, and Gunter (2004), multimedia can be used as an effective learning tool to help mitigate online course attrition and drop out. Here again you see the concept of motivation and one's ability to grasp the course content in an online course environment. Moreover, multimedia can be combined to produce a visually enriching environment that has the potential to improve the online instruction and facilitate student learning. According to Ryan and Kasturi (2002), the utilization of animation, video, and audio in online courses can be effective in enhancing the students' understanding of vital concepts. Central to the construction of online courses is the concept of instructional design. Instructional design of online courses is particularly significant for courses that have a strong emphasis on visual aspects, such as construction processes or engineering. A meta-analysis study by Liao (1999) examined 35 studies and concluded that multimedia-based instruction is more effective than traditional instruction. However, 10 of the 30 studies showed that traditional instruction is more effective than multimedia-based instruction. Liao (1999) confirmed

that multimedia-based instruction has overall positive effects on student learning, but it largely depends on what type of instruction it is being compared to. Dillon and Gabbard (1999) reviewed 30 experimental studies on multimedia effects and found that there was no significant evidence that multimedia improves comprehension. Clark (1983) also viewed that the use of media does not influence student achievement. "It was not the medium that caused the change but rather a curricular reform that accompanied the change. Basically, the choice of vehicle might influence the kind or distributing instruction, but only the content of the vehicle can influence achievement" (Clark, 1983, p. 445). Clark further contended that multimedia is a delivery system for instruction and does not directly influence learning.

Integrating multimedia components in online courses has been a hot topic since its use in education. The issues that have been associated with online courses have been extensive due to the limitations of computer hardware, software, and bandwidth. However, with the rapid advancement of multimedia technology, these issues have become less prominent in online courses. The recent advancement of computer hardware, the increasing number of high-speed Internet connections, and easy-to-use software applications make the process of using multimedia much easier (Ryan & Kasturi, 2002).

CONSIDERATIONS FOR MULTIMEDIA DESIGN

Considering the potential value of multimedia, online instructors need to fully understand the capabilities, limitations, and applications of this technology and prepare for its use in their online courses (Reed, 2003). If multimedia courses are not designed properly, the integration of audio, video, and other multimedia elements will distract rather than enhance Web-based instruction. This point has been shown to adversely affect student-learning outcomes. Mayer (2001) believed that well-designed multimedia online courses can provide an opportunity for students to improve the learning process. Vossen, Maquire, Graham, and Heim (1997) also stated that effective multimedia design involves a systematic and comprehensive approach to analyze the context of use and aspects such as the learner, task, and

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