



CHAPTER FOUR

Effect of Hypertext and Animation on Learning

Ashu Guru and Fui Hoon (Fiona) Nah
University of Nebraska-Lincoln, USA

The availability of hypertext and animation has a promising impact on education. With an increasing number of online courses and degrees offered through the Internet and a rapidly increasing enrollment in such courses, it is important to assess and understand how the use of Web-based features can affect or contribute toward learning. In this research, we propose a model to study the effect of hypertext and animation on online learning.

INTRODUCTION

Currently, the Internet dominates in the development of information and communication technology. It has taken an important role in our daily life by providing a wide range of services that include entertainment, education and business. A major advantage of the Internet is the economical and instant accessibility and availability of information resources distributed all over the globe. In the field of education, the Internet is used not only to supplement classroom teaching, but also as an increasingly popular medium for delivery of online education courses. An immense amount of research literature and Internet-based teaching modules are added to this network continually. These resources aim towards being a viable alternative for distance learning. According to a survey by the US Department of Education, a total of more than 54,000 online education courses were offered in 1998, with 1.6 million students enrolled (Lewis et al., 1999). Such online courses continue to proliferate very quickly.

Advances in Internet technology have provided users access not only to text and graphics but also digitized audio, video signals and animations as well. Two online features that have made the Internet more adaptable for education and learning are *Hypertext* and *Animation*.

“Hypertext” is the organization of information units into connected associations that the users can choose to relate at the click of a mouse. Hypertext has been found to be an effective method of training because it provides users flexibility and control over the method, speed, location and order of information access (Marshall and Shipman, 1995). In this way it caters to a wide range of users who have different goals, interests, requirements and comprehension abilities. Hypertext not only allows students the flexibility to access class information discretely in order to match their pace and personal requirements, but also furnishes students with a knowledge domain through which they can gain/retrieve information at their own pace to match their study order.

Research has shown that individuals comprehend information better with visualization than with written text. One of the simplest forms of visualization is “Animation.” Animation refers to computerized simulation of processes using images to form a synthetic motion picture. In the context of learning, Pezdek and his colleague (Pezdek and Stevens, 1984; Pezdek, 1987) predict that the use of the visual mode of communication increases the grasping and retaining capability of the human mind. Animation is also expected to contribute toward learning since it appeals to the power of the human visual system (Clary, 1997). In Kehoe’s (1996) review of studies on animation in education, visual aids are found to have a dramatic positive effect on learning if certain conditions (“explanative text,” “sensitive tests,” “explanative illustrations,” “inexperienced learners”) are met (Mayes, 1989). Menn (1993) evaluated the impact of different instructional media on student retention of subject matter and found that students retain almost 90% of a task if they carry out the task themselves even if only using computer simulation. The findings were confirmed by Gokhale (1996) who conducted a study to show that effective integration of computer simulation enhances the performance of students.

The Internet and its related technologies have provided us with a new dimension in education and a wider range of new teaching and learning styles. With an increasing enrollment in Web-based courses and the large amount of resources invested in designing such courses, it is important to investigate how *Hypertext* and *Animation* can influence students’ interaction and motivation in such environments as well as their impact on effectiveness in learning. Using the concepts of *Flow* (Csikszentmihalyi and Csikszentmihalyi, 1988; Hoffman and Novak, 1996) and *Media Richness* (Daft and Lengel, 1984), we construct a model to explain the effect of hypertext and animation in the online learning environment.

DEFINING LEARNING

It is difficult to provide a formal definition of learning, but in simple terms learning may be expressed as the development of high order thinking and evaluation skills. Pogrow (1994) suggested that for students to be competitive, they must possess cognitive strategies that will enable them to think critically, make good decisions and solve challenging problems. In addition, effective learning stimulates

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