Chapter VI
Web-Based Technologies, Technology Literacy, and Learning

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ABSTRACT

This chapter consolidates information regarding the role of technology in K-12 education, including policies related to it at a global level, the current status of its use in the classroom, and its impact on student learning. Its main focus is on the World Wide Web where its rich source of information and educational tools remains largely untapped in many K-12 classrooms. The chapter provides an illustration of how some Web-based technologies can be used to promote constructivist learning and foster the development of technology literacy in K-12 students. It also informs researchers and educators of issues and challenges faced by teachers and students in the classrooms in using these Web-based technologies and resources as pedagogical tools for concept development and promoting technology literacy.

INTRODUCTION

The shaping of today's contemporary society can be recognised in the quick pace of the integration of technological development in all sectors of life. In the business world, the impact of technology has seen many routine tasks, both in administration and production, streamlined and reduced in the amount of time required. Employees in the 21st century are focused on tasks that require higher-order thinking skills (Weil, 2002). The transformation in the activities of the workplace from the industrial era to the current information/knowledge era has meant that a different set of skills is required of the workforce of today. In the industrial era, the workplace was very much hierarchically structured so that workers were told what to do, jobs

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were routine and stable, and workers dominantly used the same set of skills throughout their careers. Re-training and lifelong learning were not common features of that era. However, in the 21st century:

Organizational structures need to change. Hierarchies need to be broken down and networked organizations developed. Successful organizations are flexible and able to adapt quickly. Group and team working, often cross functional, geographically displaced and changing frequently, stimulates creativity and innovation, enhances communication and knowledge sharing, and utilizes the best skills and experience on every task. (Oxbrow, 2000, p. 2)

To prepare students for these trends in society, there is a need for them to be reflected in the teaching and learning in the classroom. As part of this preparation, there is a need to be aware of the divergent aspects of technology—from the mechanical thoughtless machine that takes over routine tasks, to the sophisticated and partially automated machine that requires the user to have a complex understanding of the task being done and to be able to critically evaluate sometimes contradictory information and options that the technological process produces. Both of these dimensions are relevant, but in different ways, to education and work.

At the school level, students need to be prepared not only to enter the workforce, but also to become informed and active citizens who are able to critically evaluate information reported by the media, information found in books, magazines, and journals, as well as on the World Wide Web, so that they can shape their participation in social life. They need to become critical thinkers who are able to make decisions about matters that will affect their own lives and those of people around them. This trend in education of moving towards process knowledge (learning to learn and think) and critical thinking development has been discussed by Good (1999). In his paper "Future Trends Affecting Education," Good describes the evolving nature of education and also sees future trends where schools will be results-driven and striving towards high achievement as they become more accountable and are increasingly required to compete for students and funds. As a consequence, Good argues, there will be more emphasis on process (rather than content) knowledge and the development of students' critical thinking skills. The presence of technology will drive changes in the education system by shifting the balance between the two sets of conditions listed in Table 1 (Good, 1999, p.12).

Table 1. Evolving nature of education (Good, 1999, p. 12)

From…	***Toward…***
School time	Learning anytime, anyplace
Teacher-centered	Student-centered
Textbook funds	Education resource funds
One pace for all	Different rates and styles of learning
Buildings	Multiple access points for learning
Mass instruction	Personalized instruction

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