Ways in Which Technology Enhances Teaching and Learning

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Abstract

Canada is an information-rich society where the amount of information and knowledge is doubling at a significant rate. (Thornburg, 1997) Technology, a product of this information, has an enormous impact on how educators teach and on how the students learn. Among the questions educators must now address are: How do students learn best in school? How will the use of technology increase the student's learning in a given subject area?

The Research Question to be examined in this paper is, "How should use of technology enhance teaching and learning?"

Introduction

Presently, technology is "restructuring education, and changing teaching and learning in ways that impact on all [educators]. Roles are changing, new expertise is required, and new skills must be learned … [Teachers] must find meaningful ways and workable strategies for teaching with technology" (EDES 545 - Module 1). It has been said that, "Information Technology" is the great enabler. (Plotnick, 1999, p. 3) A computer is a wonderful tool for enrichment and may indeed be the primary technological tool available to educators. The use of computers and technology in elementary, secondary, and postsecondary classes can enhance student learning in many ways. In this paper, several of these ways have been researched and will be examined in detail.

Background Research

The *International Society for Technology in Education* outlines several key points in the new learning environment: multimedia, student-centred learning, real-world context, active/exploratory/inquiry-based learning, and information exchange. (Thomas &

Knezek, 2002, p. 16) Means et al., (1993) state that, “teachers can draw on technology applications to stimulate real-world environments for experimentation, so that students can carry out authentic tasks as real workers would, explore new terrains, meet people of different cultures, and use a variety of tools to gather information and solve problems” (p. 43). Technology has been called a neutral tool, which provides a variety of new ways to communicate and gain information, as well as new ways to match students learning styles. (Loertscher & Achterman, 2002, p. 51)

In 1994, the *Educational Leadership Journal* cited ten crucial reasons for using technology in schools, which include:

1. Students learn and develop at different rates.
2. Graduates must be proficient at accessing, evaluating and communicating information.
3. Technology can foster an increase in the quantity and quality of students' thinking and writing.
4. Graduates must solve complex problems.
5. Technology can nurture artistic expression.
6. Graduates must be globally aware and able to use resources that exist outside the school.
7. Technology creates opportunities for students to do meaningful work.
8. All students need access to high-level and high-interest courses.
9. Students must feel comfortable with the tools of the Information Age.
10. Schools must increase their productivity and efficiency. *(Educational Leadership)*

Keeping Technologically Savvy

The greatest challenge for society in the twenty-first century is keeping pace with the knowledge and technological expertise necessary for finding, applying, and evaluating information. (Thornburg, 1997) In recent years, technology has become a basic element in the curriculum documents in Canada. Computers and the Internet have also become an integral part of day-to-day life for most Canadians and today’s classrooms should reflect

this. Students need to become fully prepared for entering a post-secondary education or the workplace.

Linda Melnyk (2003) states, "As the goals of education change to reflect new social and educational needs, strategies for integrating technology into teaching and learning also are changing." The Ontario Curriculum document, which deals with the role of technology, states that,

> Teachers should work collaboratively within and across disciplines to effectively plan for the integration of computers and information technologies into the teaching/learning process. As the technology capable of enhancing student learning becomes available, teachers should, within a reasonable period of time, incorporate that technology into their planning of instruction and learning activities in individual disciplines and, collaboratively, across disciplines. … Using an activity-based, project-driven approach to learning, they will also develop information technology skills to support their development of knowledge and other skills. *(Ontario Ministry of Education, 2000)*

The following information and suggestions are examples of how teachers in secondary schools can use technology, along with best practices to enrich the learning environment and enhance student learning. Some possible ways to use technology that will enhance students learning are as follows:

- Examine Real-Life Problems (Pallof and Pratt, 1999),
- Problem Solving Skills (Williams, 1996),
- Use Different Forms of Media (Thomas & Knezek, 2002),
- Improved Thinking Skills (*U.S. Department of Education)*
- Knowledge Builder (Loertscher & Achterman, 2002),
- Learn Through Simulations (Levine, 2002),
- Become Better Researchers and Independent Learners,
- Accessible to Both Male and Female Students (Mooney, 2003),
- Assessment Tool (Mooney, 2003),
- Increased Communication in Communities (Pallof & Pratt, 1999), and
- Cross-curricular.

Connecting Research to Real Life Situations and Experiences

Most of my teaching experience has been at the secondary school level and so my

reflections and experiences will be based on teaching grades 9 to 12. In my schools, there has been a great push to have all of the teachers using the computer technology. As teachers, we are expected to use this technology, in some way, in each of our classes. It is really left up to the teacher to decide how we will use it. For example, all teachers must create the students marks, comments, and learning skills for the report card electronically. There are teachers who refuse to do anything else with technology. Brand (1998) makes an excellent observation that "If technology is to be used by students, then teachers must possess the confidence, understanding, and skills to effectively incorporate technology into their teaching practice" (p. 11). Therefore, all teachers should attempt to learn and to use the school's technology. Currently, I am trying to get a SMART whiteboard for our school because I see it as a great benefit and I want to use the latest technology in my classes.

Possible Use of Electronic Technology In An English Classroom

Using technology in my classes is quite important to me, and I will continue to incorporate more of it in my classroom. Textbooks, novels, and handouts are useful and serve their purpose, but supplementing the material with media and technology will provide increased avenues for student learning. Examples of such technology include the following:

- CD Roms/Software
- Powerpoint Presentation
- Government Web sites
- Internet Resources
- Music: Radio/ CD's
- Online Statistics
- Videos/DVD/Films

In my English classes, I want the students to have the ability to use all of the available

technology. I am continuously trying to upgrade my technological skills so that I can prepare better lessons and implement better assignments. If a student wants to do a Powerpoint presentation or web site in my class, I think it is a great idea and I offer my assistance, if needed. I try to encourage my students to type up their major assignments. In order to fulfill course requirements, I have my students use technology for Internet research (assignments); online correspondence (email); word processing (reports, essays); presentations (Powerpoint); CD's (music); DVD's/videos (films); and CD Roms (assignments). I know that I could use technology more often than I am doing at the present time and I intend to increase this use in the future.

To help the students become productive members of the technology age, schools need to make technology, such as the Internet, an integral part of the classroom setting. The Internet (also known as the World Wide Web) is a mega storehouse of information. In the classroom, this is a great resource tool because it allows the students to collect and gather information from various sources. (Owston, 1997) There are many tools on the Internet that allow students to communicate not only with each other, but also with others in the world. These tools include e-mail, chats, newsgroups, and message board. They all aid in developing the students communication skills and alleviates the fear of a face-to-face confrontation. (Pallof & Pratt, 1999)

The Internet is an excellent tool to facilitate research and inquiry. There are many reasons why teachers should use the Internet in their classrooms. The Internet can take virtual field trips, research online newspapers and magazines, use multimedia, and talk to professionals or experts online. The Internet can also provide authentic learning

experiences. As well, it can serve as personal motivation, inspiration, and interest. (EDES 545 - Topic 4)

Having made these points it is essential to recognize and to caution students that information on the Internet cannot be accepted uncritically. Information can be placed on the Internet by unqualified individuals or organizations. The validity of information must be tested. A crucial component of using this technology is training the student to evaluate and judge the material available. In addition, the Internet sources maybe superficial and the student must recognize when it is necessary to obtain more in-depth analysis possibly from traditional resources such as library research.

There are several purposes for getting students on the "Information Superhighway." These purposes include:

- Real world examples of integrated knowledge,
- Facilitates collaborative learning,
- All about communicating,
- Caters to different learners in different ways,
- A cultural, racially, physically, sexually blind medium. (Williams, 1996, pp. 22-24)

One particular performance task or assignment that could be used in any English classroom is known as a WebQuest. The majority of the work involved in a WebQuest is completed through online research. The WebQuest provides background, connects prior knowledge to new learning and asks students to work independently and in cooperative groups in order to solve a problem. A WebQuest also reflects some of Bloom's Taxonomy by requiring students to analyze, synthesize, and evaluate information. Through this process, students complete a project and communicate their findings to audiences that can make use of their data. For example, it is best to have a problem or

issue (ie. Civil Rights Movement) dealt with simultaneously by all the students in the class. Students will discuss and research unique aspects of the topic. It gives students the flexibility to develop personal understanding that is still relevant to the class as a whole. Another benefit is that the problems can be authentic and based on real-world situations.

Some of the transferable skills I want the students to learn by using available technology include: communication skills; research skills; thinking skills; teamwork skills; and problem-solving skills. (Ontario Ministry of Education, 1995)

Research Affecting Present Practice

Personally, I feel that computers and technology cannot replace the teacher or his/her lessons, instead, these tools should be used to supplement the curriculum. Professor Kleinsmith said that, "Computers are not a replacement for lectures, they supplement them" (Blank, 1997, p. 1). There are many ways that technology can enhance teaching and learning. Examples include: more engagement, greater motivation by students, improved communication skills, assessable to students of all levels and abilities, good assessment tool, excellent research tool, better prepare students for post secondary education and/or workplace, encourages independent learning, and fosters cooperative learning.

In the English program, it is important for teachers to:

- Encourage students to explore a variety of sources, databases, and resource centres for both information and enjoyment,
- Use a wide range of graphic, visual, auditory, and human resources in their planning,
- Help students to determine for themselves the knowledge, skills, and resources they need to accomplish a learning task,
- Incorporate resources and research skills in appropriate lessons,
- Create a classroom environment rich in resources,
- Encourage students to use a variety of resources,

- Model resource use by acting as a co-learner with students and by using a wide range of materials and resource people, and
- Incorporate resource-based assignments and projects for students.

Information technology makes it possible to provide better-quality learning in that the material can provide alternate paths for learning, responding to various learning styles. For example, some students are comfortable with thinking, and so textual presentations are the most appropriate for them. Other students prefer to learn by doing such as experimenting with simulations. (Levine, 2002) While others prefer to learn visually by seeing images and video. (Owston, 1997) A teacher can also pace the presentation of the material so the students are able to absorb it.

Incorporating Technology

Technology can be integrated into all levels of education. The *US Department of Education* conducted a study that outlines the key ideas regarding the use of technology in the curriculum. The educators in the study stated that there are several different reasons for bringing technology into their schools.

1. Support Thinking Processes - Many teachers cited a belief that computer-based technologies could provide support for thinking processes. Many respondents stressed opportunities that technology provides for acquiring problem-solving skills - either through instructional software designed to teach problem solving or through the many requirements for solving problems that naturally emerge when one is trying to use computer tools to accomplish a task

2. Stimulate Motivation and Self-Esteem - A second frequently cited rationale for introducing technology was to stimulate motivation (Mooney 2003) and self-esteem. Through either personal experience or a review of the literature. Many innovators perceived the dramatic effects that technology can have on students' interest in class activities and their sense of their own capabilities.

3. Promote Equity - In the case of several schools serving students from low-income homes, technology innovators stressed the importance of giving these students the technology tools that would equip them to compete with children coming from more affluent homes where technology is commonplace.

4. Prepare Students for the Future - The concern for equity is related to a fourth major motivation for introducing technology--to prepare students for the future. Respondents at a number of sites foresaw a future in which both higher education and the world of work would be infused with technology. These educators argue that schools have a responsibility to give students--and especially students from low-income homes--the confidence and skills in using such technology that they will need after graduation.

5. Explore Technological Capabilities - In several cases, there were individuals who were simply intrigued by new technologies and wanted to explore what they could do. (U.S. Department of Education)

Conclusion

In order for this to be a successful experience, the teacher and the student must work together to enhance teaching and learning in the classroom. As cited in the research, several uses of the Internet are: research and collecting information, contacting experts, publishing student projects, student collaboration, and accessing current news. The students can interact with the information: online, in classroom groups, in virtual environments, and with books. There are many combinations and options for enhancing student learning with technology. Teachers want the students to be engaged in meaningful learning in and outside of school in hopes that the students will become life-long learners. Life-long learning would likely permeate the students' experiences with technology.

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