Education 6620: Issues and Trends in Educational Computing
Module 1 Assignment

A Review of Current Issues and Trends

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Technology as a Tool to Augment the Curriculum:

Introduction:

Technology is a tool, nothing more (Richmond, 1997). Maximizing the benefits of acquiring a tool, and integrating it into one's repertoire, requires an understanding of how that tool can be used most effectively. This is certainly true of computers. As sophisticated as they are as tools, computers alone cannot cure the ills facing the education system. Nor can they work any wondrous magic on their own, simply by virtue of their presence in the classroom. They should not be there simply for the sake of being there, and they should not be used if that use comes at the detriment of other key areas of the curriculum. On the same note, the existence of this technology cannot be ignored by the education system. Technological competency on the part of graduates of the education system is critical to success in today's labour force. The key is to integrate computers into the classroom in such a way that they augment, rather than detract from other critical aspects of the curriculum. The nature of computer technology is such that technical competency can be achieved both through direct instruction, and transparent incorporation into other subject areas. The question is, just how are schools and educators supposed to achieve this.

Teachers are Ill-Prepared:

California teacher Alan Warhaftig observed "the dirty little secret is that nobody really knows what to do with this stuff," (Banks and Renwick, 1997). This is by far the only thing about the educational applications of technology that most teachers can agree upon (Banks and Renwick, 1997). Nobody really knows how to best incorporate technology into their classrooms, because most teachers lack adequate training with educational technology (Banks and Renwick, 1997; Gimbert and Zembal-Saul, 2002). Computers are tools, just like any other piece of technology that has been incorporated into schools. The problem is that they are very powerful tools, and they should not be used simply to do the same old things that have always been done in classrooms. This would be a tremendous waste of educational dollars, and would do a tremendous disservice to students (Richmond, 1997). Computers should be used to augment those areas of the curriculum that teachers can already cover effectively through other means. In order to be able to do this, teachers require more training (Banks and Renwick, 1997; Gimbert and Zembal-Saul, 2002). This training should not be focused upon specific applications of computer but, rather, on preparing teachers to devise and implement new, creative, and meaningful uses. It should also focus on preparing teachers to recognize, and accommodate for the dangers and shortfalls of computers as educational tools (Banks and Renwick, 1997; Gimbert and Zembal-Saul, 2002; Murphy and LaFerrière, 2002). In addition, teachers are faced with the problem that many students are unprepared to operate in classroom situations where computers can be put to good use. Students do not know how to respond to teachers who shift their roles from dispensers of knowledge to facilitators of constructivist learning. Consequently, teachers require more training in how to manage constructivist-based learning situations, and how to prepare students to operate under such conditions. This may seem like a daunting task, but the rewards are worthwhile. It can make the learning experience more meaningful, and it better prepares students for graduation into the realities of post-secondary education, and the workforce (Banks and Renwick, 1997; Clopton, 2002; Murphy and LaFerrière, 2002).

Proper and Improper Use of Technology:

Effective incorporation of technology into the education system requires awareness on the part of educators and policy-makers of the proper and improper uses of technology. More effective training of educators can help to achieve this goal. For one thing, computers should not be in schools just for their own sake. They should not be used in situations where more traditional methods would be not only effective, but also more beneficial to students. For instance, there are fears that the integration of computers into primary school classrooms may do more harm than good. While primary students gain the technical skills necessary to make computer use transparent in later years, they could be losing out on the kind of interpersonal contact necessary to develop critical social skills (Clopton, 2002). In this sense, it may be better to minimize the reliance of primary classrooms upon computer technology. In keeping with the topic of interpersonal contact, using computer-based instruction to replace teachers should also be avoided. Again, computers are tools. They are not facilitators, and they cannot meet the needs of a wide range of students as effectively as a human teacher (Mann, 2001). The highest and most complex levels of computer integration need a teacher to craft and guide effective learning situations. Rather than replacing lessons, computers should be used to reinforce the curriculum, and to recruit the student as an active participant in the learning process (Banks and Renwick, 1997; Murphy and LaFerrière, 2002).

Examples of Effective Use of Computers:

Research in recent years has been able to dispel doubts as to the ability of technology integration to effectively augment the curriculum, and improve the learning experience. One of the oldest, and most widely known educational applications of computers has been for drill-and-practice (Richmond, 1997). While teachers can utilize drill-and-practice techniques without computers, the benefits of computers in this area have been demonstrated. They make the task of generating drill-and-practice problems much easier for teachers. They can also serve to motivate students, as computers are more engaging than that textbooks or blackboards, and they can provide instant and beneficial feedback to students.

Computers can also effectively achieve more complex educational goals. The use of virtual-literature circles has been studied to demonstrate the effectiveness of computers at eliciting more frequent, and more complex student responses to literary texts (Thomas and Hofmeister, 2002). It is noteworthy that the computers themselves were not what achieved this goal. This was accomplished through carefully crafted integration, with the use of specifically worded prompts. The computers became effective tools because the educators determined how to best use them to draw the responses out of students. Teachers worked with the computers to create a higher-order learning experience for students.

Effective integration of computers may also mean a reorganization of the learning environment. When announcing an agenda for aggressive integration of technology into American schools, the Clinton administration recognized model schools in California for initiatives that helped to make their learning environments more effective (Banks and Renwick, 1997; Clopton, 2002). Among these initiatives were the physical rearrangement of classroom layouts, the extension of class periods to accommodate more detailed learning experiences, increased numbers of interdisciplinary programs, and dissolving classes to create multi-aged learning teams that worked on complex, self-paced projects (Banks and Renwick, 1997).

The benefits of the Internet and the World Wide Web cannot be ignored when it comes to effective computer integration. Aside from being a vast resource of information (Murphy and LaFerrier, 2002), the Internet can facilitate web-based projects such as those using the *WebQuest* design (Dodge, 1998). *WebQuests* can be designed for virtually any subject area, and have been shown to engage students in active learning by guiding them as they seek relevant information, interpret it, and put it to meaningful, curriculum specific use.

Finally, there is the use of the Internet for the online delivery of education. While it is inappropriate to use computers to replace teachers, software packages such as *WebCT* are a demonstration of the highest degree of effective integration of computers as a tool to be utilized by teachers. Online education uses *WebCT* does not mean education by a computer. It means that teachers have been provided with a tool that allows them to teach students anywhere in the world. Again, the education received by these students is still facilitated by the human instructor. The computer, and the Internet, becomes the tool that makes it possible. Research into such uses of technology has shown that the quality of the education received by students, and their achievement when utilizing the *WebCT* online format, are at the very least on par with those of students receiving traditional classroom instruction (Thirunarayanan and Perez-Prado, 2002).

Conclusion:

Computers have become so pervasive in society, and in the modern workplace, that educators cannot ignore them. They must be integrated into the education system if graduates are gain the technical competencies they need to survive in the modern world. However, computers should not be brought into classrooms for their own sake. They should be incorporated in such a way that they augment the learning experiences of students. Being a tool, they should be used to make the learning experience more effective. In order to achieve this, educators need to be trained in the integration of technology. As it stands, this training is for the most part lacking. Educators and policy-makers must also be aware of the dangers of improper uses of computers in schools, and attention must be paid to examples of effective computer use. While it is difficult to reach a consensus as to how computers can be best incorporated, training and the successes of others can be a starting point to get teachers into the mindset of using technology to its fullest potential as a means of expanding rather than replacing the current learning experience.

References:

Banks, Sandy, and Lucille Renwick. "Technology is Still a Promise, Not a Panacea; Classroom Computers: A Progress Report," *Los Angeles Times*. [Online]. Available at: http://www.realworld.org/archives/timesarticle1.html, Sunday, June 8, 1997.

Clopton, Heather. "Nobody believes it's the quick-fix for America's K-12 ills: Linda Roberts on the role of technology in the classroom," *KeyNotes*. [Online]. Available at http://www.4teachers.org/keynotes/roberts/, 2002.

Dodge, Bernie. *The WebQuest Page*. [Online]. Available at: http://webquest.sdsu.edu/, 1998.

Gimbert, Belinda, and Carla Zembal-Saul. "Learning to teach with technology: From integration to actualization," *Contemporary Issues in Technology and Teacher Education*. [Online]. Available at: http://www.citejournal.org/vol2/iss2/currentpractice/article1.cfm, 2002.

Mann, Bruce. *Introductory Video to Education 6610: Research on Computers in the Curriculum*. [Video]. St. John's, NF: Faculty of Education, Memorial University of Newfoundland, and Memorial University of Newfoundland School of Continuing Education, 2002.

Murphy, Elizabeth, and Thérèse LaFerrière. "Classroom Management in the Networked Classroom: New Problems and Possibilities," *Technology, Teaching and Learning*, Barrie Barrell, ed. Calgary: Detselig Enterprises, 2002.

Richmond, Ron. "Integration of Technology in the Classroom: An Instructional Perspective," *SSTA Research Centre Report #97-02*. [Online]. Available at: http://www.ssta.sk.ca/research/technology/97-02.htm, 1997.

Thirunarayanan, M.O., and Aixa Perez-Prado. "Comparing Web-Based and Classroom-Based Learning: A Quantitative Study," *Journal of Research in Education*, vol. 34, number 2. David J. Ayersman and W. Michael Reed, Eds. Eugene, OR: International Society for Technology in Education, 2001.

Thomas, Matt, and David Hofmeister. "Assessing the effectiveness of technology integration: message boards for strengthening literacy," *Computers & Education: An International Journal*, vol. 38, Jean D.M. Underwood and Eileen Scanlon, Eds. Oxford, England: Pergamon, 2002.

Over-Reliance upon Technology and the Disintegration of Basic Skills:

Introduction:

Computers are rapidly changing the face of education, but at what expense? Schools, education officials and society in general have recognized that information technology has become so pervasive that it cannot be ignored by the education system. Success in the modern labour market requires a certain degree of technical literacy, and it has been widely recognized that schools have a responsibility to impart that literacy (Clopton, 2002; Richmond, 1997). There have been fears, however, that the integration of computer technology into schools would come at the expense of other, more traditional areas of the curriculum (Banks and Renwick, 1997; Clopton, 2002; Richmond, 1997). Basic reading, writing, and arithmetic skills could be included amongst these areas. A trend has been seen in recent decades of a steady decline in student mastery of such basic skills. It appears that the opposite can be said for basic computer literacy skills. Many students, including some who have displayed low achievement in other academic areas, display strong skills with the use of computers; oftentimes students are more technically capable than their teachers (Banks and Renwick, 1997; Murphy and LaFerrière, 2002). The question is, have computers become so pervasive, and their use so transparent to the current generation of students, that attempts at mastering other basic skills are being neglected? Are declining achievement rates in basic academic skills a result of over-reliance upon rapidly advancing technological tools? If so, or even if not, is there a way that this same technology can be used to turn such a trend around, improving the chances of students to master basic academic skills that are every bit as vital to functioning in today's society as technical literacy?

Causes of the Disintegration of Basic Skills:

Blaming technology for declining achievement in other areas of the curriculum is not necessarily an accurate depiction of what is in fact a very complex problem facing educators, and society today (Clopton, 2002; Richmond, 1997). It seems easy to place the blame on technology. High school students can use sophisticated graphic calculators, yet often show weaknesses with basic arithmetic skills. English students can use many of the features of word processors, but some lack basic reading, writing, and cursive writing skills. In many ways, these trends are simply coincidental. The actual problems are socioeconomic and even political in nature, and lay outside the scope of this commentary. If technology can be linked to these problems, it could be in two key ways. The first is that the push for technology integration has shifted attention away from other critical education issues (Clopton, 2002). The second is that, while computers are powerful tools, educators have not utilized them properly or to their full potential. Teachers simply have not been adequately trained to use computers as effective learning tools (Banks and Renwick, 1997; Gimbert and Zembal-Saul, 2002).

The Role of Computers in Improving Basic Academic Skills:

Numerous studies have been conducted on the use of computers to help increase student achievement levels with regards to basic, and even complex academic skills. The key is knowing how to effectively integrate these beneficial uses of computers into individual

classrooms (Banks and Renwick, 1997; Gimbert and Zembal-Saul, 2002; Murphy and LaFerrière, 2002). It is impossible to summarize all of the most effective ways to integrate technology into schools; as Alan Warhaftig said (Banks and Renwick, 1997) "the dirty little secret is that nobody really knows what to do with this stuff." There may be little consensus as to the best uses of computers (Banks and Renwick, 1997), however, some beneficial applications have been demonstrated. The most widely recognized educational application of computers is for drill and practice exercises (Richmond, 1997). This is a task for which a teacher does not need to incorporate technology, but it certainly makes the job easier. Computers can come up with example problems more quickly than teachers, and can provide students with instant and beneficial feedback. They can also be more motivational than requiring students to solve a series of problems from a textbook or blackboard (Banks and Renwick, 1997).

The use of computers to help students improve their skills with grammar and writing has also been studied, and shows some promise (Holdich, 2002). The key here is that teachers must go beyond using the computer simply as a tool allowing students to create polished looking work, and must begin seeing computers as an aid to evaluating the technical aspects of large volumes of student work. Computers can more easily spot grammatical trends in students' work, including errors, than can teachers. Using computers to analyze the technical aspects of students' work can free up teacher time, and provide students with accurate and useful feedback, while allowing teachers to concentrate on the more creative and subjective elements of writing.

It has also been demonstrated that effective integration of computer technology, specifically utilities for online student interaction, can be beneficial to the development of more complex abilities (Thomas and Hofmeister, 2002). Virtual-literature circles have been studied to determine their impact on the ability and frequency of student submissions of complex responses to issues raised by literary texts. While the use of the technology itself was not an impetus for submitting more frequent and more complex student responses, integration of this tool with the use of carefully crafted questions to prompt responses showed huge potential.

Conclusion:

Technology is a tool. That is, in fact, one way of defining the word technology (Richmond, 1997). The tool itself, simply by virtue of its presence in schools, will not cause a degradation of basic academic skills. Nor will it prevent further degradation, or become a cure for this problem. It is the way the technology is being used that will either contribute to, or help solve the problem.

References:

Banks, Sandy, and Lucille Renwick. "Technology is Still a Promise, Not a Panacea; Classroom Computers: A Progress Report," *Los Angeles Times*. [Online]. Available at: http://www.realworld.org/archives/timesarticle1.html, Sunday, June 8, 1997.

Clopton, Heather. "Nobody believes it's the quick-fix for America's K-12 ills: Linda Roberts on the role of technology in the classroom," *KeyNotes*. [Online]. Available at http://www.4teachers.org/keynotes/roberts/, 2002.

Gimbert, Belinda, and Carla Zembal-Saul. "Learning to teach with technology: From integration to actualization," *Contemporary Issues in Technology and Teacher Education*. [Online]. Available at: http://www.citejournal.org/vol2/iss2/currentpractice/article1.cfm, 2002.

Holdich, C.E., R.G. Holdich, and P.W.H. Chung. "Assessing aspects of children's written grammar: automating the process," *Computers & Education: An International Journal*, vol. 39, Rachelle S. Heller and Jean D.M. Underwood, Eds. Oxford, England: Pergamon, 2002.

Murphy, Elizabeth, and Thérèse LaFerrière. "Classroom Management in the Networked Classroom: New Problems and Possibilities," *Technology, Teaching and Learning*, Barrie Barrell, ed. Calgary: Detselig Enterprises, 2002.

Richmond, Ron. "Integration of Technology in the Classroom: An Instructional Perspective," *SSTA Research Centre Report #97-02*. [Online]. Available at: http://www.ssta.sk.ca/research/technology/97-02.htm, 1997.

Thomas, Matt, and David Hofmeister. "Assessing the effectiveness of technology integration: message boards for strengthening literacy," *Computers & Education: An International Journal*, vol. 38, Jean D.M. Underwood and Eileen Scanlon, Eds. Oxford, England: Pergamon, 2002.

Dealing with Downtime:

Introduction:

As the sophistication of technology increases, so too does its level of integration into our daily lives and activities. Some technologies have become so pervasive that they are virtually transparent in modern society (Banks and Renwick, 1997; Clopton, 2002; Richmond, 1997). Computers, and the use of the Internet, have reached this sort of level. There is a problem associated with such heavy reliance upon technology. The more sophisticated the technology, the more possible ways it can foul-up, break down, and fail the user. This problem is a serious one for anyone whose daily activities rely upon computers. It is especially true in the field of education. Technology will fail you, so how do educators deal with downtime? How can educators prepare themselves for this inevitable fact of computing life? And how can the education system prepare itself to minimize the impact of technical problems, or to avoid the occurrence of such problems altogether?

Different Types of Downtime:

There are as many different ways that technology can fail educators, as there are circuits in a computer, or servers powering the Internet. Computers are very sophisticated tools and, as Chief Engineer Montgomery Scott said in *Star Trek III: The Search for Spock* (Paramount Pictures, 1984), "the more they overhaul the pluming, the easier it is to clog up the drain." It would be impossible to describe all of the possible problems educators may face when trying to incorporate technology into their classrooms. However, it is possible to summarize a number of key types of problems that exist within today's education system.

The first problem is the antiquation of technology (Richmond, 1997). Computer technology evolves so rapidly that equipment purchased by schools becomes outdated far more quickly than anyone could ever afford to replace it. This is a very serious issue, considering the amount of money being spent on computers by educational authorities throughout North America (Banks and Renwick, 1997; Clopton, 2002; Richmond, 1997).

Technical glitches pose the most frequent type of problems. Computers often have many bugs that need to be worked out of them, such as viruses, which can effectively render them unusable for long periods of time (Richmond, 1997; Murphy and LaFerrière, 2002). These problems can interfere with a teacher's lesson plans, prevent students from completing assigned tasks, and rapidly drain a school's maintenance budget.

The scarcity of resources can be another problem faced by teachers (Banks and Renwick, 1997; Richmond, 1997). Most schools have limited numbers of computers, which must be shared between high numbers of students and classes. Oftentimes, there may be nothing wrong with the operation of the equipment. It may simply be in use by someone else, effectively stopping a well thought out lesson plan in its tracks.

Ironically, the overabundance of resources can also pose a problem (Murphy and LaFerrière, 2002). This issue relates to the use of the Internet as an educational tool. Finding the resources needed to complete assigned tasks can be fairly time consuming when it comes to the Internet, especially when students or teachers must sift through countless online sites related to topics of interest. Choosing a site and determining the validity and applicability of the material

can be difficult. Oftentimes the information contained in a site may be far below, or above the level required for the task at hand, complicating matters.

Finally, there is the misuse of technology (Banks and Renwick, 1997; Gimbert, 2002; Murphy and LaFerrier, 2002). This applies to both teachers, and students. Teachers lack adequate training to put technology to optimal use, which creates the risk of wasting valuable instructional time. Students are prone to getting off task when the task is difficult, or uninteresting. This is complicated by the introduction of computers and the Internet, which allow them to more easily stray from assigned work – and venture into dangerous, possibly illegal territory.

Always Be Prepared:

When it comes to integrating technology into the classroom, the key for teachers is to always be prepared. Be prepared for whatever may happen, and do not be surprised when it does. Proper training in educational applications of technology is necessary to facilitate this (Banks and Renwick, 1997; Gimbert, 2002; Murphy and LaFerrier, 2002). Teachers need such training in order to put computers to optimal use, and in order to anticipate all the pitfalls of opening lessons up to the use of computers. Even without specialized training, teachers can prepare themselves by more carefully planning any lessons that require computers. Teachers should have a backup plan ready, just in case the technology suddenly proves unavailable, or things do not go as intended (Murphy and LaFerrière, 2002).

Multitasking is an essential element to effective integration of computers into the classroom. Teachers must master the art of multitasking in order to meet the additional demands of the use of computers, and of endowing students with new levels of educational autonomy. Multitasking can also be used with students to help avoid technically created setbacks (Murphy and LaFerrière, 2002). Allowing for a variety of tasks that can be completed at any stage in an assignment can help to keep students occupied if technology introduces a stumbling block (Murphy and LaFerrière, 2002).

Finally, teachers must recognize that students are more than just the end-users of technical tools. They can be a resource to help effectively use technology. The technological competence of many students exceeds that of the teacher, and these students can be called upon to help avoid or resolve problems created by glitches (Banks and Renwick, 1997; Murphy and LaFerrière, 2002). And the glitches themselves can prove to be valuable learning resources, if a teacher can seize the opportunity to incorporate their resolution into the lesson plan itself (Murphy and LaFerrière, 2002).

Administrative Solutions:

Aside from preparing teachers to effectively use equipment, and to anticipate and work around problems that may arise, education systems themselves can help to avoid technology-related problems, and to minimize the impact of problems that do arise. The recruitment of technical support staff is one way to achieve this, though increased personnel can be costly (Banks and Renwick, 1997; Richmond, 1997). Another possibility is through the standardization of equipment (Richmond, 1997). Most schools right now take what they can get when it comes to computer equipment, and this variety increases the number of types of problems that can occur, and the complexity of resolving these problems. Standardizing the computer equipment

purchased by schools may have its drawbacks, but it does simplify the task of maintenance, and increase the effectiveness of maintenance personnel and help desk support. It can also simplify the issue of upgrading school systems as technology evolves.

Conclusion:

It will never be possible to eliminate all of the problems created by the use of computers in the classroom. Glitches and downtime are inevitable. However, teachers can prepare themselves through training and careful planning to deal with these problems. Students can be recruited to help resolve them. And the education system itself can take steps to try to minimize the number of problems that arise, and their impact upon the classroom.

References:

Banks, Sandy, and Lucille Renwick. "Technology is Still a Promise, Not a Panacea; Classroom Computers: A Progress Report," *Los Angeles Times*. [Online]. Available at: http://www.realworld.org/archives/timesarticle1.html, Sunday, June 8, 1997.

Clopton, Heather. "Nobody believes it's the quick-fix for America's K-12 ills: Linda Roberts on the role of technology in the classroom," *KeyNotes*. [Online]. Available at http://www.4teachers.org/keynotes/roberts/, 2002.

Gimbert, Belinda, and Carla Zembal-Saul. "Learning to teach with technology: From integration to actualization," *Contemporary Issues in Technology and Teacher Education*. [Online]. Available at: http://www.citejournal.org/vol2/iss2/currentpractice/article1.cfm, 2002.

Murphy, Elizabeth, and Thérèse LaFerrière. "Classroom Management in the Networked Classroom: New Problems and Possibilities," *Technology, Teaching and Learning*, Barrie Barrell, ed. Calgary: Detselig Enterprises, 2002.

Nimoy, Leonard, Dir. *Star Trek III: The Search for Spock*. [Motion Picture]. Paramount Pictures, 1984.

Richmond, Ron. "Integration of Technology in the Classroom: An Instructional Perspective," *SSTA Research Centre Report #97-02*. [Online]. Available at: http://www.ssta.sk.ca/research/technology/97-02.htm, 1997.

Plagiarism and the Internet:

Introduction:

The Internet is one of the most vast and easily accessible sources of information available to teachers and students today (Dean, 2002; Murphy and LaFerrière, 2002; Richmond, 1997). This is both a benefit, and a problem. The Internet has so many sources of information, that it becomes easy for students to cheat in order to complete assigned schoolwork, and it can be difficult to determine whether cheating has actually taken place. This is an issue that must be acknowledged by any educator planning to incorporate computer technology into the curriculum. Through awareness of the types of problems, and cheating, associated with such a vast repository of information, teachers can gain a better sense of their role in a rapidly evolving educational environment. They can also gain an appreciation for the power of computers, and the Internet, to actually deter student plagiarism.

The Potential for Student Misuse of the Internet:

Increased access to information sources is without question a desirable outcome for any school (Banks and Renwick, 1997; Clopton, 2002; Richmond, 1997). The Internet provides this, decreasing the disparities between schools that for one reason or another have different levels of access to educational resources (Banks and Renwich, 1997; Clopton, 2002). However, there are fears that connecting schools to the Internet provides teachers and students with too much, too fast. As far as students are concerned, this can be a dangerous thing. Many students do not have adequate training in using the Internet to locate the information that they need, and in how to determine the validity of that information, or its applicability to the task at hand (Goot, 2002; Murphy and LaFerrière, 2002). The problem is that there is too much information, and students can get lost in the process of finding what they need, losing sight of the objective of the assigned activity, and wasting valuable time.

Another problem is that students often lack adequate instruction in what constitutes academic fraud when it comes to using the Internet (Goot, 2002; Murphy and LaFerrière, 2002). And the Internet provides many opportunities to commit such plagiarism. The vast array of information sources makes it easy for students to copy and paste information, thus passing off work found on the Internet as their own. Students often do not realize that there is no difference between doing this, and copying the text of a book found in the local library. Others are aware of this, but figure that there is little likelihood of being caught. Aside from copying and pasting from online sources, the Internet poses a new problem for educators. Through resources like *Google Answers*, students now have instant access to experts who will answer their questions, or solve problems for them, for a small fee (Glasner, 2002; Goot, 2002). These experts are sometimes unaware that they are helping students to cheat on assignments. Others are aware, but do not really care so long as they get their money.

With resources such as these at students' disposal, teachers have good reason to fear the possibility those students will cheat, and learn nothing from the academic process. There are other pitfalls for students of which teachers must be aware. The Internet provides a plethora of distracts for students, and can very easily be misused in other ways (Murphy and LaFerrière, 2002). Many students are prone to getting off task when provided with easy opportunities, and the Internet is a perfect example. Some of these opportunities to stray from the academic task at

hand can go far beyond simply wasting valuable instructional time. They may even be illegal. Among the more common examples are visiting the sites of favorite rock bands or automobiles, playing online games, or downloading pornography or information on bomb making.

The Role of the Teacher:

Teachers must be vigilant of the possibilities for student misuse of the Internet, and the Internet can be a very powerful and beneficial tool if educators are aware of the role they must play when integrating it into the learning experience. One problem in this respect is that most teachers lack training in the educational applications of computer technology (Banks and Renwick, 1997; Gimbert and Zembal-Saul, 2002). However, with experience, there are some things that teachers can learn to do to make the learning experience more rewarding for everyone involved. First, teachers must be vigilant about keeping students on task (Murphy and LaFerrière, 2002). The ability to see what all students are doing while online can help to accomplish this, and can be achieved simply through the careful arrangement of computer terminals (Murphy and LaFerrière, 2002; Richmond, 1997). Teachers can also provide students with instruction about the dangers of the Internet, and what constitutes proper and improper use (Goot, 2002; Murphy and LaFerrière, 2002). Many schools have already recognized the need for this, and have adopted acceptable use policies which students must acknowledge in writing (Murphy and LaFerrière, 2002). Aside from this, teachers can take a little extra time to prepare before giving students online assignments (Goot, 2002; Murphy and LaFerrière, 2002). An example of effective preparation includes conducting Internet searches ahead of students, to gain a greater idea of what types of resources they will encounter. Teachers can even take this task one step further, compiling lists of suitable Internet sites that students can use to complete assigned work. These lists can either be distributed in the form of a handout for students, or links to suitable sites can be compiled onto a web page created by the teacher.

Teachers can also take advantage of the power of the Internet to help catch, and deter plagiarism. The first thing that teachers can do is remind students not only that plagiarism is unacceptable, but that efforts can and will be made to detect it (Glasner, 2002; Goot, 2002). There are a number of online resources teachers can use catch cheaters. Simply using a web browser such as *Google* is one method. All that teachers have to do is enter in a few lines of text from a student's assignment, and the browser can find the site from which that text was lifted. Other resources include web applications specifically designed to help students cheat, and to help teachers detect plagiarism (Glasner, 2002; Goot, 2002). Teachers can scan some of the more popular sites used by students to find prepackaged essays, and answers to problems. They can also take advantage of resources like turnitin.com, which are specifically designed to help teachers find the original sources of fraudulently submitted work. The advantages of these tools are threefold (Glasner, 2002; Goot, 2002; Murphy and LaFerrière, 2002). First, if students are aware that teachers can, and will try to catch them in the act of cheating, then they will be less likely to commit plagiarism. Second, teachers gain a powerful tool for catching those who do cheat, and maintaining the integrity and credibility of the work that they assign. Third, teachers gain yet another academic tool. That is, the opportunity to educate students about the uses and dangers of the Internet, about developing a strong work ethic, and about determining for themselves what constitutes credible and useful information.

Conclusion:

There is a distinct need to incorporate computers, and Internet use, into the learning experience. This need stems from the fact that students must be competent in the technical aspects of computer use, and in the ethical and effective use of technology. Teachers must be aware, however, of the dangers of providing resources like the Internet to students, just as they must be aware of the positive and negative features of new textbooks to be used in the classroom. The Internet may provide students with more opportunities to cheat, and do themselves an educational disservice. But it also provides teachers with a tool to detect and deter such cheating, and to strengthen the quality of the technological education they provide to their students. It is inevitable that students will gain access to the vast powers of computers and the Internet. It is the responsibility of teachers to ensure that students know how to use those powers, and how to avoid abusing them.

Resources:

Banks, Sandy, and Lucille Renwick. "Technology is Still a Promise, Not a Panacea; Classroom Computers: A Progress Report," *Los Angeles Times*. [Online]. Available at: http://www.realworld.org/archives/timesarticle1.html, Sunday, June 8, 1997.

Clopton, Heather. "Nobody believes it's the quick-fix for America's K-12 ills: Linda Roberts on the role of technology in the classroom," *KeyNotes*. [Online]. Available at http://www.4teachers.org/keynotes/roberts/, 2002.

Dean, Katie. "Schools, Tech: Still Struggling," Wired News. [Online]. Available at: http://www.wired.com/news/school/0,1383,54682,00.html, 2002.

Gimbert, Belinda, and Carla Zembal-Saul. "Learning to teach with technology: From integration to actualization," *Contemporary Issues in Technology and Teacher Education*. [Online]. Available at: http://www.citejournal.org/vol2/iss2/currentpractice/article1.cfm, 2002.

Glasner, Jeanna. "Where Cheaters Often Prosper," Wired News. [Online]. Available at: http://www.wired.com/news/school/0,1383,54571,00.html, 2002.

Goot, Dustin. "Thin Line Splits Cheating, Smarts," Wired News. [Online]. Available at: http://www.wired.com/news/print/0,1294,54963,00.html, 2002.

Murphy, Elizabeth, and Thérèse LaFerrière. "Classroom Management in the Networked Classroom: New Problems and Possibilities," *Technology, Teaching and Learning*, Barrie Barrell, ed. Calgary: Detselig Enterprises, 2002.

Richmond, Ron. "Integration of Technology in the Classroom: An Instructional Perspective," *SSTA Research Centre Report #97-02*. [Online]. Available at: http://www.ssta.sk.ca/research/technology/97-02.htm, 1997.