

Hicks, D., Sears, P., Gao, H., Goodmans, P., & Manning, J. (2004). Preparing tomorrow's teachers to be socially and ethically aware producers and consumers of interactive technologies. *Contemporary Issues in Technology and Teacher Education* 3(4), 470-481.

## **Preparing Tomorrow's Teachers to Be Socially and Ethically Aware Producers and Consumers of Interactive Technologies**

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Technological literacy will be a necessity — not a frill — in the 21<sup>st</sup> century. The most important single benefit that the communications revolution can deliver to each and every child in this country is an advanced cutting-edge 21<sup>st</sup> century education. The way to do this is to provide modern communications technology to every teacher and every student in every classroom in every school in the country. (Raney, 1997, para. 3)

Preparing tomorrow's teachers to recognize and harness the potential of technology within their content areas is seen as a vital role of teacher education institutions throughout the United States (International Society for Technology in Education [ISTE], 2000; National Council for Accreditation of Teacher Education, 1997; President's Committee of Advisors on Science and Technology, 1997). In fact, it is hard to ignore the pervasiveness of information technology (IT) within education, on both a national and international scale.

Diem (1999) argued that over the last several years a great deal of progress has been made toward integrating technology and education and that we are "living in a time of instructional revolution, [where] the changing nature of information and new techniques of presenting it to children enable us to change teaching environments" (p. 2). In 2000, the National Center for Education Statistics released data that shows, as of fall 2000, 98% of public schools were connected to the Internet with a student-to-instructional computer with Internet access ratio of 7:1 (Cattagni & Farris, 2001).

Research by the Pew Internet and American Life Project (2001) revealed, "The Internet has become an increasingly important feature of the learning environment for teenagers" (p. 2). The development of this networked infrastructure in schools and homes over the last decade goes a long way toward explaining the potential of IT within the classrooms (Becker, Ravitz, & Wong 1999).

However, care needs to be taken to avoid blindly integrating technology into the classroom without paying attention to important issues relating to the social and ethical uses of technology by teachers and students. Cunningham (2002) was correct and thought provoking when she stated,

Teachers with no practical preparation or experience in social, ethical, and legal issues surrounding digital technologies create another area of concern. Even if teacher candidates are capable of using a variety of technologies, the belief that they are cognizant of the ethical and legal issues surrounding emerging technologies is questionable... How do we ensure that our classroom teachers are prepared to model and enforce legal and ethical use of digital resources? (p. 31 - 32)

Valid concerns have been raised with regard to issues of Internet safety and the need to help young people use information and communication technologies in an ethical and socially responsible manner (Berson, Berson, & Ralston, 1999; Hoj, 1998; Kleg, 1997).

Stories of students downloading pornographic images onto laptops provided to them by their school district (O'Dell, 2001) and a sixth-grade student in Florida arrested on felony charges for altering his grades on his reading teacher's electronic grade book (SysAdmin, Audit, Network Security Institute, 2003), the possibility of young people being preyed upon online, and concerns regarding the reliability, credibility, and appropriateness of many sites (Burke, 2001) reveal some of the dangers and difficulties facing schools, teachers, and parents when they allow children to go online.

Institutes such as the Responsible Netizen in the Center for Advanced Technology at the University of Oregon (<http://responsiblenetizen.org/>), and the Bertelsmann Foundation (<http://www.bertelsmann-stiftung.de/project.cfm?nId=831&aId=2422&lan=en>) have begun to develop a literature base regarding Internet safety, Internet responsibility, and the social and ethical uses of communication technologies in schools. According to a survey by the National School Board Foundation (2002), a growing number of school's leaders (9 out of 10) are taking the concept of Internet safety seriously, considering "more than 90% of school districts have installed filtering software" (p. 11).

Although such filters can help protect children, Berson et al. (1999) stressed the vital role teachers and adults must play in supervising children's online activities "for the sake of safety and learning" (p. 161). If teachers are to be held ultimately responsible for safety issues within their classrooms, teacher education institutions have the responsibility for preparing beginning teachers to use

technology as a partner in their classrooms in a safe and ethically responsible manner.

The purpose of this paper is to detail the efforts of one teacher education institution to meet the ISTE (2000) standards that focus on preparing teachers to "Design student learning activities that foster equitable, ethical, and legal use of technology by students .... Practice responsible, ethical and legal use of technology, information, and software resources." This paper discusses (a) the rationale, design, structure, and resources used in the Ethics and Technology in the Classroom (ETC) WebQuest in relation to the goals and needs of the teacher education program at Virginia Tech, (b) elementary and secondary preservice graduate teachers' responses and reactions to the ETC WebQuest, and (c) key implications with regard to ethics and safety for teacher educators as they begin to prepare preservice teachers to use technology in the classroom.

### Design Rationale

In order to help prepare beginning teachers within the teacher education program at Virginia Tech to explore such important emerging issues in the classroom, an Ethics and Technology in the Classroom (ETC) WebQuest (<http://www.tandl.vt.edu/technology-ethicswebquest/index.htm>) was designed for both elementary and secondary graduate preservice teachers. There is a growing body of literature on the value of WebQuests as an instructional approach that integrates structured inquiry and the use of technology (Gohagan, 1999; March, 2000; Milson; 2002; Milson & Downey, 2001; Molebash & Dodge, 2003).

Developed in 1995 by Bernie Dodge and Tom March, a WebQuest is

an inquiry-oriented activity in which most or all of the information used by learners is drawn from the Web. WebQuests are designed to use learners' time well, to focus on using information rather than looking for it, and to support learners' thinking at the levels of analysis, synthesis and evaluation. (Dodge, n.d.)

It is an inquiry-based model, using resources from the World Wide Web. Dodge (1997) noted that WebQuests should contain at least the following parts:

1. An *introduction* that sets the stage and provides some background information.
2. A *task* that is doable and interesting.
3. A set of information *sources* needed to complete the task. Many (though not necessarily all) of the resources are embedded in the WebQuest document itself as anchors pointing to information on the World Wide Web. Information sources might include web documents, experts available via e-mail or real-time conferencing, searchable databases on the net, and books and other documents physically available in the learner's setting. Because links to resources are included, the learner is not left to wander through web space completely adrift.

4. A description of the *process* through which the learners should go in accomplishing the task. The process should be divided into clearly described steps.
5. Some *guidance* on how to organize the information acquired. This guidance can range from guiding questions, or directions, to complete organizational frameworks such as timelines, concept maps, or cause-and-effect diagrams.
6. A *conclusion* that brings closure to the quest, reminds the learners about what they have learned, and perhaps encourages them to extend the experience into other domains.

The rationale for using a structured inquiry approach via the WebQuest design arises from Bruner's cognitive development theory. For Bruner, the outcome of cognitive development is thinking. "Knowledge is a process, not a product" (Bruner, 1966, p. 72). The learners create their knowledge by "rearranging or transforming evidence in such a way that one is enabled to go beyond the evidence so assembled to additional new insights" (Bruner, 1961, 22).

In the ETC WebQuest project, there is no single place that tells the learners what is correct and what is wrong. Instead, ethical and social responsibilities relating to technology and the classroom are divided into several subcategories and illustrated by five different scenarios. Using the guiding questions and resources provided, preservice teachers begin to develop possible solutions to each of the five scenarios:

1. Copyright and plagiarism (<http://www.tandl.vt.edu/technology-ethicswebquest/1.htm>).
2. Critical thinking and the Internet (<http://www.tandl.vt.edu/technology-ethicswebquest/2.htm>).
3. Acceptable use policies in the classroom (<http://www.tandl.vt.edu/technology-ethicswebquest/3.htm>).
4. Online safety and ethics in the classroom and at home (<http://www.tandl.vt.edu/technology-ethicswebquest/4.htm>).
5. Other related issues (<http://www.tandl.vt.edu/technology-ethicswebquest/5.htm>).

Bruner's discovery learning and inquiry teaching methods are applied to each scenario. For example, in the copyright and plagiarism scenario, following a story about technology issues in a classroom, five scaffolding questions are asked that, when answered using the available sources, provide the basis for preservice teachers to complete a series of predetermined tasks (<http://www.tandl.vt.edu/technology-ethicswebquest/task.htm>). The learning process is guided by the step-by-step questions and supporting online resources designed to help the learners become "autonomous and self-propelled thinkers" (Bruner, 1961, p. 23).

## **Design Principles**

WebQuests can be short or long term, depending on how long students have to work with the material. In this case, the ETC WebQuest is a longer term project of several weeks or months, with a goal that Marzano (1992) called "Dimension 3: extending and refining knowledge" (see pp. 87-105). Learners interact with a large body of knowledge and create "products," such as posters, presentations, and classroom Acceptable Use Policies (AUPs) relating to the ethical and safe uses of technology within the classroom that can be used with students, parents, and other educators (<http://www.tandl.vt.edu/technology-ethicswebquest/process.htm>).

## **Resources Selection**

The Internet serves as the source for this project's resources. A staggering amount of information exists on the web. The process of choosing reliable and effective information was a big concern during the design process. First, the design team, using ISTE standards, brainstormed to outline what issues needed to be addressed in the ETC WebQuest. Next, each designer conducted a wide search for Internet sites that would serve as a strong resource base for each of the five scenarios making up the WebQuest. Then at weekly meetings, the designers and the project director evaluated each resource in terms of its relevance, reliability, and appropriateness for preservice teacher education.

Emphasis was placed on educational, nonprofit, and government web sites, as these types of sites are most likely to contain reliable information and are not likely to disappear over time. Then, web sites duplicating information were weeded out. Considering the length of time the preservice teachers were expected to spend on the ETC WebQuest, the designers finally limited the resource web sites to five or six for each category.

After the resource selections were finalized, the design team organized them and created scenarios to guide the learning process. True stories served as the basis for scenarios. News sites such as National Public Radio and CNN were searched. Although they contained relevant news, the news stories did not cover all the issues the team wanted to include in the project. In the end, the decision was made to create fictional scenarios (<http://www.tandl.vt.edu/technology-ethicswebquest/scenarios.htm>) on the basis of the true stories. Then, the sequence of the questions was outlined according to the "from simple to deep" principle, whereby the questions within each scenario spiral from the basic to the complex in order to facilitate the learning process and help the learners understand the points of the scenarios.

In the final selection phase, a number of high quality web sites were removed from the scenario pages in order to avoid overwhelming the user, and in response to concerns regarding the inordinate download time certain resources would take when working through a 56k-modem connection. Rather than discarding such resources, an additional annotated "Resources" web page (<http://www.tandl.vt.edu/technology-ethicswebquest/resources.htm>) was

created to provide a more comprehensive list of relevant web sites for preservice teachers who wanted to further explore ethical uses of technology.

An evaluation/completion checklist (<http://www.tandl.vt.edu/technology-ethicswebquest/evaluation.htm>) was developed to illuminate how learners' products were to be evaluated. In order to evaluate the potential utility of the ETC WebQuest, elementary and secondary preservice teachers were introduced to the ETC WebQuest in an introductory graduate technology class: Educational Applications of Microcomputers.

### **Teaching Rationale**

Educational Application of Microcomputers is an introductory course for elementary and secondary preservice teachers in the use of technology in the classroom. The course focuses on computer literacy and specialized applications of microcomputers in school settings in the areas of microcomputer hardware, computer assisted instruction, and other local-school application software. Preservice teachers learn about hardware and software troubleshooting, the use of other technology devices (PDAs or handheld devices, scanners, digital cameras, video cameras, SmartBoard technology, and projectors), file management, software applications (web design, word processing, database, spreadsheet, FTP, PDF, and others), and Internet usage.

The ETC WebQuest was introduced for the first time as a means to incorporate both a teaching and leaning strategy. The goal was to introduce preservice teachers to (a) the potential of the Internet within education, via modeling a teaching strategy designed to engage learners in an Internet inquiry-based activity; (b) the rationale, structure, and design of the WebQuest concept; and (c) ethical and legal issues relating to the use of technology in the prekindergarten to 12th grade (PK-12) classrooms. By the end of the course, the preservice teachers not only experienced the ETC WebQuest but also designed and developed a content area or grade-specific WebQuest for their own classrooms.

### **Teaching Principles**

Prior to receiving instructions about the ETC WebQuest, preservice teachers were asked to bring in an Acceptable Use Policy (AUP) from their internship schools. The AUP served as a focal point for introducing issues of responsibility and ethics relating to the use of technology in the PK-12 setting. Many preservice teachers expressed surprise at the amount of responsibility required by the AUP documents. Others expressed concern over the difficulty of ensuring their students' compliance and the possible repercussions if they, as future teachers, were not aware of the policies they were charged to implement. The robust discussions held by the elementary and secondary preservice teachers set the stage for their exploration and engagement with the ETC WebQuest.

## **Evaluation and Findings**

After completing the ETC WebQuest assignment, the preservice teachers were asked to voluntarily evaluate the ETC WebQuest by participating in an online qualitative survey. Specifically, the survey addressed the following areas:

- Strengths of the ETC WebQuest.
- Challenging aspects of the ETC WebQuest.
- Important skills, concepts, and dispositions learned through the ETC WebQuest.
- Impact of the ETC WebQuest on perceptions/opinions of the ethical uses of technology.
- Changes to the ETC WebQuest that would improve learning, instruction, and experience about the ethical and responsible use of technology.
- Usability of the WebQuest strategy as a tool to integrate technology into the classroom.

Thirty out of a possible 37 responses were returned. The elementary and secondary preservice groups consisted of 8 and 22 respondents, respectively. Comments were generalized across the elementary and secondary preservice groups, with reactions categorized into three major themes: (a) Recognition of teacher responsibility related to integrating technology into the classroom, (b) an increased awareness of social, ethical, and safety issues relating to the integration of technology in the classroom, and (c) commentary about the design of the ETC web site.

Several responses revealed that many preservice teachers had a limited understanding of the responsibilities facing teachers when utilizing technology within their classroom. As one participant commented, "Using technology in the classroom is a lot more complicated than I imagined. There are so many bases to be covered." Recognizing the need to understand such issues was also reflected in the following participant comments: "I learned a lot of information I did not know. I never gave this area much thought because of the field I am studying," and "There are many areas that I had not thought about in detail previous to the assignment."

The majority of participants pointed out the usefulness of the ETC WebQuest as a resource to introduce the ethical issues relating to the use of technology in the classroom:

I already questioned how to address certain legal and ethical issues when using technology as a learning tool. WebQuest has opened my eyes to new issues and answers the question of how to gain control over a good portion of other issues.

The ETC WebQuest also provided a number of participants the opportunity to engage in the process of reflecting critically upon their own online activity:

I realize that I may have been doing things wrong with the way I have used web sites. I realized that I may have to get a better grasp of policies before I begin to teach my students, so they don't have the same confusion.

Participants also discussed the responsibility involved in monitoring students' use of the Internet, while suggesting that the ETC WebQuest helped them develop an awareness of the technological safety tools available to protect students while using the Internet. One respondent noted: "The WebQuest touched on important issues that a teacher can face in the classroom, and as a teacher in training, it is helpful to spend time thinking and preparing for these issues ahead of time."

Many of the preservice teachers expressed that the ETC WebQuest gave them an opportunity to explore a range of issues that teachers might face in the classroom: "I would say the most important concept I took out of the assignment was that there are several aspects to consider when using the web/computer as a learning tool."

A number of responses identified specific details and insights that the ETC WebQuest provided with regard to the preservice teachers' future understandings and actions in the classroom:

- "The most important concepts presented in this WebQuest include (1) Acceptable Use Policies (AUP); (2) Copyright law; and (3) assistive and ergonomic technology."
- "Students and teachers are frequently confused about copyright and plagiarism. I found this information to be very helpful."
- "I think it was valuable to learn and understand what fair use is and what constraints teachers and students are under in regards to copyright laws."
- "It is important to instill in students the understanding that online interactions are not free of consequence. They should respect computers, with regards to how they use them and with what intentions they use them."

What became clear from the responses was that the ETC WebQuest created a heightened awareness of issues that had never been explicitly addressed and discussed with our preservice teachers. The participants began to develop an awareness of their roles and responsibilities as teachers in 21<sup>st</sup>- century classrooms with regard to educating their own students as to their rights, obligations, and responsibilities when using technology as part of the learning process: "I realize that I am solely responsible for what my kids do in the classroom regarding computer use."

Another participant clearly saw the need for teachers to be proactive in teaching students how to use technology responsibly: "As a teacher, it is fundamental that students understand their responsibilities when using Internet resources and, more importantly, they know the ethical and moral consequences of plagiarism."

Overall, the preservice teachers' responses revealed that they gained a great deal of insight regarding, on the one hand, their future roles in developing socially and ethically aware producers and consumers of interactive technologies and, on the other hand, the utility of WebQuests as a tool to engage students in structured inquiry projects through participating in the ETC WebQuest experience.

Many participants found the ETC WebQuest design to be an easily navigable and useable system through which to explore key issues:

- "I would not change the navigational aspect of the web site. It was easy to get to different pages and sites as needed to complete the assignments,"
- "The layout was very user friendly. Having resources that have already been checked out for validity and content was a time saver. In addition it made it possible for the user to focus on the topic."

It is interesting to note that, although some preservice teachers suggested that the guiding questions were not challenging enough, a minority expressed initially feeling a little lost because they had not previously explored or completed a WebQuest. This may have had more to do with the fact that the ETC WebQuest was introduced within a short time frame, while it is designed to be a long-term endeavor. One participant noted,

It might be good to "portion out" a WebQuest by doing small parts of it over the course of several class periods in order to integrate it into other learning and not just have a large period of computer work.

The responses provide baseline data for understanding the future design, use, and utility of the ETC WebQuest within the teacher preparation program at Virginia Tech. One area to be explored will involve means of achieving a balance between supporting preservice teachers who were initially overwhelmed by the ETC WebQuest and offering other preservice teachers who felt confined within the ETC WebQuest structure a more open-ended investigation of issues.

One possible approach is to offer two alternative formats through which preservice teachers may choose to examine issues of safety and ethics. The ETC WebQuest will serve as one option. A second option may come in the form of a Web Inquiry Project (WIP; <http://edweb.sdsu.edu/wip/>). Developed by Phillip Molebash at San Diego State University, WIP's are designed to promote classroom inquiry without the built-in structure of a WebQuest (see Molebash & Dodge, 2003).

Whether teacher educators use WebQuests or WIP's to prepare preservice teachers to learn about the legal and ethical uses of computer technology, the initial evaluation data of the survey revealed the necessity of such an endeavor. There is scant evidence to suggest that any of the preservice teachers would have developed any depth of understanding of such key issues had they not participated in the ETC WebQuest. If teacher educators are not prepared to offer such opportunities, the question to be asked is, who will prepare future teachers

to "communicate the value of legal and ethical uses of digital resources for future generations" (Cunningham, 2002, p. 32)?

### **Conclusion**

The initial evaluations suggest that the ETC WebQuest (a) provided preservice teachers with valuable insights into the roles and responsibilities facing teachers and schools as they integrate technology into their classrooms while (b) simultaneously introducing the WebQuest concept as a teaching and learning strategy. Based upon the positive feedback provided, the ETC WebQuest will become a requirement on Virginia Tech's technology competence checklist for all graduating preservice teachers.

As detailed previously, it is clear from the reactions to the ETC WebQuest that preservice teachers were not fully aware of key safety and ethical issues inherent in the process of integrating technology into the classroom. In the process of preparing tomorrow's teachers to use technology, Cuban (2001) contended that an important question that needs to be continually asked is, "In what ways can teachers use technology to create better communities and build strong citizens?" (p. 197).

Identifying and addressing safety and ethical issues as an integral part of a teacher's role in preparing digitally literate citizens to use technology within the networked global community in a safe and socially appropriate manner must be viewed as a keystone supporting wise and thoughtful practice in the networked classrooms of the 21<sup>st</sup> century. Promoting responsible practices will occur only through the explicit preparation of teachers who are aware of what they are doing, as opposed to those who are not.

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