

Using Technology for Powerful Social Studies Learning

By Stephen A. Rose and Phyllis Maxey Fernlund

Recent developments have created new opportunities for powerful social studies teaching assisted by technology. Major improvements have taken place in both hardware and software. Computers are much more powerful and versatile than they were a decade ago. Although many educational programs at that time were oriented toward drill and practice, it is now easy to find interactive and engaging programs. Using the right combination of hardware and software, teachers can develop lessons that enhance student skills in information retrieval, the presentation of data, the comparison and evaluation of different perspectives, and critical reflection and decision making.

As is often the case, efforts to take advantage of these opportunities in the classroom make important demands on individual teachers. Successful computer-based instruction requires careful planning, informed choices of hardware and software, and the matching of educational programs to curricular objectives and student abilities. Our purpose in this article is to identify the key considerations that should influence the selection of instructional technology in order to assist educators to evaluate current products and assess the feasibility of their use in the classroom.

The Changing Technological Landscape

The field has come a long way in the thirteen years since *Social Education* published microcomputer courseware evaluation guidelines developed by an ad hoc committee established by National Council for the Social Studies (NCSS).¹ The typical computer in 1984 had 256k memory, dual 5.25" floppy drives or, in some cases, a 10 to 30 megabyte hard drive. Many monitors were monochromatic, and graphical interfaces were virtually absent, except for Apple Computer's Macintosh,^a which was introduced that year in a memorable Super Bowl television advertisement.

The computer software of 1984 was also primitive by today's standards. Educational games such as *Oregon Trail* and *Dangerous Parallel* were interactive and engaging, but they tended to be the exception rather than the rule. This was one of the primary motivations for developing the 1984 NCSS courseware evaluation guidelines.

We have come a long way since those early years. We talk more about work stations than computers. A contemporary work station might combine a powerful computer with a high resolution color monitor, CD-ROM drive, a high-speed modem, scanner, speech synthesizer, digital camera/recorder, videodisc player, as well as a telecommunications link to on-line services and the Internet. The computer that is central to this task might be powered by a Pentium or PowerPC chip and be equipped with a 300 megabyte (MB) to 2–3 gigabyte (GB) capacity hard drive and 16–32 megabytes of memory.

Since 1984, many advances have been made in the development of software and related technology of peripheral devices. There have been major innovations in the design of instructional software, multi-media/hypermedia programs, and telecommunications interfaces. These advances allow students and teachers to develop and access significant content relevant to the social studies curriculum. Many of these programs make strong attempts to engage the learner and help support powerful teaching and learning.

At the same time, the social studies landscape has some re-shaped contours, as reflected in the publication by NCSS of *Expectations of Excellence: Curriculum Standards for Social Studies*.² The ten strands of the standards provide teachers with assistance in setting unit and course goals and outcomes, evaluation of current practice, and ideas for instruction and assessment.

These developments require a re-examination of the criteria by which computer-based technology products should be judged for integration in the social studies classroom. Up-to-date criteria will go well beyond the framework of the 1984 Social Studies Microcomputer Courseware Evaluation Guidelines and require that educators re-think the issue of evaluation in three areas:

- * Hardware configurations that allow the implementation of technology-based products. Multimedia products, authoring programs, and telecommunications.
- * The relationship of technology-based products to curriculum standards and teaching and learning of the social studies.

For each of these areas, we propose (and, in some cases, reiterate) a number of questions for social studies teachers to consider as they incorporate technology-based products into their instruction. Answering these questions will help promote the effective use of technology in the social studies.

Hardware: Configurations, Use, and Power

Software programs today are more sophisticated and interactive than their predecessors, and require computers that have greater processing capacities, memory, hard drive space, and ports for peripheral devices. To share in the benefits from advances in technology embodied in current software, social studies educators must participate in the ongoing acquisition and upgrading of their schools' technology facilities. Determinations about what type of hardware to acquire, or what upgrades to invest in, should be the result of answers to the four questions listed below.

Hardware-Related Questions to Consider

1. What are the instructional tasks and levels of complexity? Do I have the necessary technology?
2. Do my computers have enough memory to run the desired software application?
3. What type of technical delivery system will be used: single computer(s) or computers attached to a local area network (LAN), or a wide area network (WAN) and/or the Internet?
4. Is the speed of the network sufficient to accomplish the instructional task in an efficient and timely manner?

It is important to consider the first question so that sound decisions can be made about the type of computer technology to acquire and how it will be used in the social studies. If the tasks will require only basic word processing, spreadsheets, and data bases, inexpensive computers with few enhancements will suffice. Alternatively, if the computer will be used for tasks such as sophisticated desktop publishing or elaborate multi-media presentations, then the software applications required for these tasks will demand more powerful (and faster) computers and a wide array of peripheral devices. The use of multimedia and telecommunications places extra demands on computer memory and hard drive space. Multimedia programs often require additional audio-visual (AV) ports to attach peripherals such as digital/video cameras, scanners, and videodiscs.

Advances in both computers and software allow for the implementation of computer networks. Networks allow students working in computer labs within the same school, in schools within a district, or in schools among districts, to work together by transferring information to each other via computer. If activities such as these are judged of value, then one needs to consider whether the school or district's current networking technology is up to the task. Computers in a school computer lab or within classrooms are connected by a local area network (LAN) which allows them to communicate with one another. Similarly, a wide area network (WAN) allows computers located within a school district to communicate. Beyond local and wide area networks is the Internet.

To accomplish instructional tasks where many students will be using computers at the same time, the network needs to have the capability to transfer information in a timely manner. Generally speaking, unless the connection is based on optical fiber, increasing the number of persons using the connection

simultaneously decreases the transfer rate of information. We should not have students sitting around drumming their fingers waiting for information to appear on screen. Waiting for information can become particularly problematic when accessing the Internet during day time work hours.

Computer Assisted Instruction (CAI)

During the 1980s, computer-assisted instruction (CAI) was an important part of classroom computer use. Teachers, department chairs, and district technology coordinators purchased commercial and public domain programs in the subject areas, stored on one or more floppy disks, including drill and practice programs, tutorials, simulations and games. During the next decade there were four major changes that improved CAI:

(1) the decline in the use of floppy disks, replaced by the enhanced storage capability of CD-ROM and videodisc;

(2) enhanced interactivity in software in which students play a more active role; (3) sophisticated graphics, video clips, color and sound, creating a multimedia presentation no longer dominated by screens of text; and (4) the growing marriage of CAI and telecommunications, allowing a seamless transition from single-computer use to collaborative work with distant partners and access to Internet-based resources.

The use of CAI in the social studies classroom continues to be strong, although such use is being eclipsed by the tool uses of computers: word processing, communications, research, and multimedia production. CAI is available on the Internet, a helpful tool for teachers who want to review the product and consult other teachers who have used the program with their students. CAI has greatly improved in creativity and quality; many programs offer motivating experiences for students in analysis, problem solving and decision making.

To guide the evaluation of this enhanced class of computer-based instruction products, we offer the following questions to consider:

CAI-Related Questions to Consider

1. How does this computer program help achieve my objectives for this unit of study? Can I modify the program to fit my plans better?
2. Does my computer system have the right hardware to run this program (required memory, printers, speech synthesizer, other peripherals)?
3. Is the program easy for students to use? What preparation do students need? What preparation do I need?
4. Does the publisher offer technical assistance, free or inexpensive updates, network licenses?
5. Does the program offer multiple options for delivery? For example, can the program be used over the Internet or linked to sites on the World Wide Web (the Internet's hypertext-based environment)?

Multimedia for Teachers and Students

Multimedia refers to the marriage of video, sound, graphics, text and images within a single information delivery system.³ Such programs help teachers and students assemble multiple types of information about topics in the form of photographs, video and animation sequences, charts and graphs, text, sound, and graphics. The sources of this information include print materials as well as videodiscs, CD-ROMs, Web sites on the Internet, audio recordings, scanned images, and digital camera slides. Multimedia presentations created by a commercial publisher or by the teacher or student can provide powerful perspectives on another time and place in history that reach beyond written text.

The evaluation of multimedia in social studies can be viewed from two perspectives: (1) students and teachers as users of commercially developed packages, and (2) students and teachers as creators of multimedia presentations.

Teachers and Students as Multimedia Users

Multimedia products from such companies as National Geographic, ABCNews Interactive, and Scholastic offer user-friendly packages for presentations, research, and inquiry activities. Whether using videodiscs or CD-ROM, most programs have interfaces that allow the user to easily navigate through the program. Most commercial videodiscs have a bar code guide and bar code reader/remote control. Operating the videodisc player is not much different from using the remote control for the VCR. The teacher can scan the appropriate bar codes into the remote control, and then point it at the videodisc player to instantly move to various places on the disc. Multimedia packages can be presented as whole, or they can be modified as necessary, choosing only those segments that are needed for the presentation.

Use of commercially-prepared multimedia can help teachers provide variety in instruction and, just as importantly, can offer opportunities for in-depth exploration of ideas and questions. Lectures and large class presentations that incorporate multimedia can include a variety of maps, historical footage, excerpts from famous speeches, photographs, interviews, and graphs that add a powerful component to learning. Remote and abstract issues are transformed into something that students can grasp using visual information as well as print resources.

For use of already-developed multimedia packages, we recommend consideration of the following questions:

Multimedia-Use Questions to Consider

1. Do I have the necessary technology to use this multimedia package, including sufficient computer memory, a videodisc player/CD-ROM drive if needed, a large screen monitor or projection device for large class viewing?
2. What is the perspective of this commercial package? How does this viewpoint differ from other resources that I plan to have students use?
3. Is this product to be used by teachers or students? Do I want to use the entire package or select particular parts?
4. In what ways will this use of technology enhance my students' learning? How can I assess the impact on learning?

Teachers and Students as Multimedia Creators

Some teachers have become producers of their own multimedia lessons. Students can create individual or group presentations that develop their skills in information retrieval and communication as well as create presentations that provide evidence of their understanding of the social studies content and their own perspectives. Working at this level requires technical skills, access to multimedia work stations, and sufficient time to create the product.

Many videodiscs include authoring software; this feature allows the teacher or students to build a multimedia presentation using only the computer, videodisc player and videodiscs. This is an easier way to begin to create presentations because it limits the research time and the number of peripheral devices used, and the learning curve is generally less for the program's authoring software.

Videodiscs can include extensive data bases, visuals combined with narration, timelines, maps, animation and video clips. The user can select from among these resources and provide his or her own narration recorded as the visual selections are displayed. In evaluating multimedia packages, the teacher needs to consider the previous experience that students have had creating this type of learning product. If they have never used an authoring system, students will need to begin with a simpler program and carefully organized set of resources.

Multimedia projects can become highly sophisticated requiring advanced skills in the use of technology. Hypermedia authoring programs such as *Hyperstudio* or *Director* enable the user to access and integrate information from such diverse sources as the Internet, sounds or clip art pulled from public domain software, photographs from a digital camera, images from a scanner, clips from a video camera, videodisc, or CD-ROM. As a creator of multimedia, the teacher or student is not limited to a single videodisc developed by a publisher.

A great deal of time can be spent collecting the information from a wide variety of sources for the multimedia project, and then designing an attractive, informative presentation. For example, in several Canadian classrooms, students created a “virtual tour” of a museum using the following hardware: Macintosh LC 475 computers with 8 MB of RAM with an Internet connection, two digital cameras, and a video camera. Software included *ClarisWorks* (word processor, database, spreadsheet, drawing, graphics, and telecommunications tool), *Sound Machine* (for audio), *Netscape Navigator* (for access to the World Wide Web), and *Graphic Converter* (to manipulate graphic images in a variety of formats). The teacher, Sharon Lewis, showed the students other examples of virtual tours from the Internet. Then she took the students to a museum, followed by planning sessions in which they designed their computer exhibits and learned to use HTML (HyperText Markup Language) to put their projects on the Web. As the student projects were completed, they were reviewed for accuracy, omissions, and misinterpretations by the museum director and the teacher. The students published their work on the World Wide Web, and took their parents through the virtual tour on two special presentation nights.

This example highlights an exciting project for teachers and students who are advanced users of technology. Such a project raises new questions in evaluating technology for the creation of multimedia projects in the social studies.

Multimedia-Creation Questions to Consider

1. Are the school’s technology resources sufficient to produce a multimedia product? Are there workstations available for the time required to develop multimedia?
2. What authoring program is best, given the previous experience of my students and the time I have allowed for this project?
3. What do my students already know about multimedia? What technical skills do I need to teach? Are there expert students who can help teach others?
4. How will I evaluate student-created multimedia projects? What are my requirements for the content of the presentation as well as the technical production?

The Internet in the Classroom

The tremendous growth in telecommunications has brought online services, specialized electronic networks, Web pages, E-mail, software, and global information resources to homes, businesses, and schools. Many people now list an E-mail and website address on their business cards. The Internet and its World Wide Web constitute both a medium of communication and a gateway to information resources. It is an environment in which millions of people participate in the creation and exchange of information. For social studies, the Internet serves as a research tool of tremendous potential.

The information accessible through the Internet can vary based on the Internet services available from a school’s library/media resource center and the classroom or computer lab. Schools often place their most expensive and extensive research tools—such as full-text periodicals, newspapers and magazines—in a centrally located system in the school library. Teachers can regularly use the Internet for current events, assigning students a particular area, such as economics or politics, or a particular region of the nation or world. The University of Michigan’s Daily News Service and Vanderbilt’s Television News Archives provide students with online assistance with current events research. There are 200 U.S. daily newspapers available through electronic access. Many magazines provide their own assistance with searches, such as Time magazine’s website, The Pathfinder. Lessons that focus on particular Web sites and search strategies are available to teachers in such books as *Educator’s Internet Companion* and websites such as Classroom Connect, Busy Teacher’s K–12 Website, and Teachers Helping Teachers.

Internet-Related Questions to Consider

1. What structure and skills do I need to provide my students so they can focus their research?
2. What are the research sites available through my access to the Internet? Do students need to use the library computers or can this activity be done in my classroom?
3. How much time will I allow for the Internet search, and what specifically do I want students to accomplish?
4. What directions do I need to prepare for students to focus their research?
5. What skills do I need to teach students about evaluating the credibility and accuracy of information retrieved from the Internet?
6. What kind of "Acceptable Use Policy" for the Internet should our school have?

When planning a student research project that uses the Internet, try to work with the school's library media specialist. This person is most likely familiar with the technical aspects of conducting searches on the Internet. Unlike a school library, the Internet is by no means a controlled research base. Virtually anybody can put information out on the Internet. There are very few parameters that serve to structure information and also serve as filters for insuring both the quality and accuracy of that information. Students need to receive instruction that teaches them the skills for determining the accuracy of information, detecting bias, determining the validity of claims, and so forth. While these skills are by no means limited just to information retrieved from the Internet, they are very important skills for students to apply to information gained from their research on the Internet.

For students to conduct a successful search on the Internet, they will have to have some skill at using an Internet browser and be familiar with a search engine's syntax so they can design "queries" for information. The Internet browser allows one to retrieve documents, video, pictures, and sounds from the Internet. The search engine and its syntax enable the user to structure the search for a particular topic or type of information. It takes time to learn the syntaxes of search engines. Learning—with the help of the library media specialist—to teach students these skills can save time and reduce frustration on the students' part.

Browsing can be an absorbing and sometimes distracting activity; but a teacher's specific directions can limit the time required without destroying the student's curiosity. Likewise, the teacher may want to monitor student activities on the Internet. Some schools use commercial Internet services, such as America Online or special protection software, to assist in monitoring student use. Issues of limiting access to particular Internet resources, limiting hours of use or time of day, and monitoring electronic conversations are important for parents, teachers, and students to discuss in order to formulate a school acceptable use policy.

Sometimes teachers do not have the time to teach students the needed skills to navigate and conduct effective research on the Internet. An alternative would be for the teacher, prior to the research activity, to research and identify a variety of Web sites that have sound information about the topic(s) to be researched. The teacher could then create a local Web page of "bookmarks" that take students directly to sites where their research is likely to be most fruitful, thereby helping to avoid some potential problems.

Technology Links to the NCSS Curriculum Standards and Powerful Teaching and Learning

Technology-based products and skillfully designed Web sites may exhibit outstanding technical qualities and match a school's technology resources, but be a poor match for the kind of social studies curriculum we seek to achieve through the NCSS curriculum standards. To help determine a product's appropriateness and potential effectiveness in the social studies classroom, one should evaluate the extent to which its content, organization, and activities relate (1) to the purposes of social studies, (2) to one or more of the ten NCSS curriculum themes, and (3) to factors that are essential to powerful teaching and learning in social studies.

Purposes of Social Studies

Purposes of Social Studies Questions to Consider

Does the technology/the product...

1. help learners gain the knowledge, skills, and attitudes required of people who participate in public life?
2. help learners develop personal perspectives that enable them to explore events and persistent issues, and to make informed choices which reflect assessment of personal and societal consequences?
3. help learners construct an academic perspective that reflects interdisciplinary knowledge?
4. help learners construct a pluralistic perspective based on diverse viewpoints and recognize that these differences are desirable qualities in a democratic society?

Most social studies educators believe that the primary purpose of social studies is to prepare young people to participate in public life, which is essential to the health of our democratic system. This belief pervades the 1994 NCSS Curriculum Standards. Social studies programs must promote the development of civic competencies of the young. Civically competent people have a deep concern for the common good and are disposed to work for the general welfare of all individuals and groups within the community. For this important goal to be realized, young people need an education that assists them in constructing personal, academic, pluralistic and global perspectives. It is these perspectives that enable them to use knowledge to: conceptualize contexts of issues or phenomena; consider causality; inquire about the validity of explanations; and, create new explanations and models for grappling with persistent and/or recurring issues across time, space and cultures.

NCSS Curriculum Themes

NCSS Themes

Questions to Consider

How does the technology-based product help teach about and offer experiences that relate to one or more of the ten NCSS curriculum themes?

- 1 CULTURE
- 2 TIME, CONTINUITY, & CHANGE
- 3 PEOPLE, PLACES, & ENVIRONMENTS
- 4 INDIVIDUAL DEVELOPMENT & IDENTITY
- 5 INDIVIDUALS, GROUPS, & INSTITUTIONS
- 6 POWER, AUTHORITY, & GOVERNANCE
- 7 PRODUCTION, DISTRIBUTION, & CONSUMPTION
- 8 SCIENCE, TECHNOLOGY, & SOCIETY
- 9 GLOBAL CONNECTIONS
- 10 CIVIC IDEALS & PRACTICES

These strands are interrelated and draw on the social sciences and humanities, with appropriate content from mathematics and natural sciences. They are intended to present a holistic framework for those who teach and work in the social studies. Specifically, they provide teachers with assistance in setting unit and course goals and outcomes, evaluation of current practice, and ideas for instruction and assessment.

Powerful Social Studies Teaching and Learning

Powerful social studies teaching and learning is achieved when it is: (1) meaningful for teachers and students, (2) integrative, (3) value based, (4) challenging, and (5) active. The questions and explanations that follow are designed to help teachers make a judgment about whether the technology-based product being considered for use in instruction helps the teacher to achieve powerful teaching and learning.

Powerful Teaching and Learning Questions to Consider

1. Does the technology-based product help promote *meaningful* social studies?
2. Does the technology-based product help promote social studies that is *integrative*?
3. Does the technology-based product help promote *value based* social studies instruction?
4. Does the technology-based product help in planning social studies instruction that is *challenging*?
5. Does the technology-based product help in designing learning activities that *actively engage students* in significant social studies content?

Does the technology-based product help promote *meaningful* social studies?

Social studies is meaningful when students learn networks of knowledge, skills, and values that are useful in and out of school. By their design and organization, technology-based products can represent these networks in powerful ways. Meaningful learning requires the study of a few significant ideas or topics in depth as opposed to surveying numerous topics superficially, and a useful technology product capitalizes on technology's potential to provide a rich and deep information environment. Meaningful social studies is also promoted by the way topics and content are presented and developed. New topics are introduced by referencing where they fit in the big picture. Content is developed in ways that help students see relationships among elements. Current educational technology can, and ought to, help students navigate and understand these relationships.

Does the technology-based product help promote social studies that is integrative?

Social studies is integrative when the curriculum and instruction address a broad range of content, concepts, generalizations and ideas in an interdisciplinary manner. Relevant information is drawn from the social sciences, history, the arts and the humanities. In this context, the web of information resources available on the Internet has considerable potential for integrative learning. However, whether such learning occurs depends fundamentally on the teacher's ability to guide students to integrate information from the range of knowledge domains one can explore on the Internet.

Does the technology-based product help promote *value based* social studies instruction?

Social studies is value based when instruction is directed at having students grapple with the ethical and social policy implications of historical and contemporary issues. Instruction enables students to be sensitive to the values, complexities, and dilemmas involved in an issue; consider the cost and benefits to various groups; and develop well-reasoned positions that reflect an awareness of the potential social policy implications of their value based decision on the issue. Two multimedia products come to mind in this context, both by ABCNews Interactive: In the *Holy Land* and *The Lessons of War*.

Does the technology-based product help in planning social studies instruction that is *challenging*?

Social studies teachers expect students to accomplish instructional goals as individuals and group members. A good technology-based product encourages students to function as a learning community. Students work collaboratively to deepen their meaning of content and are exposed to sources of information and varying perspectives on historical and contemporary topics and issues. Instruction is directed at critical or creative thinking, suggested solutions to problems, and well-reasoned positions on policy issues. The content provided in the product/environment plays a dual role: providing the support basis for reasoned opinions and judgments, and providing a basis for students to challenge their own and others' positions on issues.

Does the technology-based product help in designing learning activities that *actively engage students* in significant social studies content?

Students are actively engaged when instruction is directed at helping students to construct knowledge so as to develop important social understandings. Good technology-based products provide opportunities for students to play active roles in authentic activities. These require the use of content for accomplishing life applications such as debates, role plays, construction of models, interviews, community participation, and simulations of trials or legislative activities.

What's Next?

We have raised a handful of general questions educators might ask as they consider technology use in social studies classrooms in light of both changes in technology and the current NCSS Curriculum Standards. Many of these questions could serve as the focus for future discussion in *Social Education*, and could certainly sustain a series of professional development workshops in a school or school district. As general questions, they serve as a starting point for future elaboration. Perhaps this will lead to the development of a new set of evaluation guidelines that better reflect both the state-of-the-art in technology and current thinking about the purposes, methods, and content of social studies. Suggestions and recommendations directed to the NCSS Select Committee on Technology are most welcome.

Notes

- 1.S. A. Rose, A.R. Brandhorst, A.D. Glenn, J.O. Hodges, and C.S. White. "Social Studies Microcomputer Courseware Evaluation Guidelines," *Social Education* 48 (November/December 1984): 573–576.
- 2.National Council for the Social Studies. *Expectations of Excellence: Curriculum Standards for Social Studies*. Washington, D.C., 1994.
- 3.C. S. White. "Interactive Multimedia for Social Studies: A Review of *In the Holy Land* and *The '88 Vote*," *Social Education* 54 (February 1990): 68–70.

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