

Technology and Civic Empowerment: Toward Inclusion and Participatory Citizenship in the Elementary Social Studies Classroom

Martin Horejsi and Beverly B. Ray
Idaho State University

Introduction

The National Council for the Social Studies (2001) defines responsible citizenship as “the knowledge, skills, and attitudes [required if one is to] assume the ‘office of citizen’ in our democratic republic” (p. 319). “A critical purpose of the educational institution in a democratic society is to prepare its citizens for their role as participants in that society...[as]...full and equal citizens” (Lindsay & Justiz, 2001, p. 7). In fact, education for *all* students is a moral mandate in a civil society (Dewey, 1944; Parker, 2001). To ready students for civil life, America’s public schools are charged with the task of educating *all* students for responsible citizenship.

While opportunities exist throughout the curriculum, elementary social studies classrooms provide many opportunities to foster citizenship skills and dispositions (Parker, 2001; Maxim, 2003). Citizenship education includes helping *all* students contribute and participate in the classroom and in society. Students who are active participants in today’s classroom stand a better chance of “exercis[ing] their rights and carry[ing] out their civic responsibilities” (Silva & Mason, 2003, p. 366).

For elementary student with disabilities, technology offers one method of empowerment allowing them to become active participants in the classroom and in their

future lives as citizens of a democratic society. Empowerment includes “self-reliance, independence, competition, and freedom of expression” (Willamson, Gonzales, & Avery, 2003, p.204); characteristics valued in a democratic society. Technologies that support meaningful social studies learning and that actively engage *all* learners are critical to assuring students’ opportunities for participation and empowerment in civic life.

Assistive Technology in the Elementary Social Studies Classroom

Assistive Technology (AT) helps students with physical, cognitive, learning, or speech disabilities perform tasks that would otherwise be difficult or impossible (Bodine, 2003; Bryant & Bryant, 2003; Horejsi, 2003). Numerous specialized AT devices exist, but their price --or availability-- often prevents their use in elementary classrooms. However, reasonably priced technologies are available to help students with disabilities participate more fully in elementary social studies classrooms.

Three categories of AT devices are available for use in social studies classrooms: Input devices, output devices, and software devices. *Input devices* allow students to enter or manipulate information in a computer. These include the keyboard and mouse. *Output devices*, such as the picture on a monitor, the printed page, and sound allow the computer to communicate social studies content back to students. *Software devices* include utility-application programs, such as a word processor or concept mapping software; educational programs designed to teach specific topics; or operating system software that controls the computer, peripherals, or even aspects of other programs.

Input Devices

The Mouse. Two substitutes for the conventional mouse include the *trackball* and the *micromouse*. A trackball, which is akin to a giant upside-down mouse, allows student to spin a ball, then let go of the ball completely before clicking a button. The device separates each input movement so they are not unintentionally combined. Many trackballs can be operated with a foot or an arm instead of a hand. Another useful device in this category is the micromouse, which is roughly the size of an egg or even smaller. Originally designed for use with portable computers in limited space, this device works quite well in small hands. For younger kids, or those with certain motor skill limitations, moving or controlling a standard size mouse is akin to rolling a soda can around, hardly a precise activity. Most micromice are *optical*, meaning they use the changes in reflected light to detect mouse movement, thus eliminating the need for a space-restrictive mouse pad.

Touchscreens. A touchscreen is an excellent choice for students unable to operate the mouse effectively whether for physical or cognitive reasons. A touchscreen is a glass or plastic window covering the computer monitor or display. Students move the cursor by sliding their fingers around on the screen, then tapping the screen once or twice to select something. Many times students with disabilities can only watch as a more able-bodied student operates the computer during such in-class activities. A touchscreen eliminates this inequity, however, by allowing all students an equal opportunity to control the computer during classroom activities. Since touchscreens can be operated with just one finger or using any pointing device, they are particularly useful in the classroom. For

example, touchscreens are effective for drill-and-practice software, where the student is required to make an onscreen selection, and for navigating within a web browser (e.g., during an Internet scavenger hunt or an electronic field trip). Touchscreens are also an effective writing tool. Student can type using a large font and use the touchscreen to move the cursor, highlight a passage, or move blocks of text around on the page. In contrast to the mouse, touchscreens draw on the physical cut-and-paste skills commonly learned by children in kindergarten, rather than requiring conceptual mouse skills that are hardly comparable to other skills children have acquired by that age.

Switches. Another alternative to the conventional mouse is the switch. A switch is a simple on-off or yes/no button of some type that uses individual, color-coded buttons designed to separate mouse functions such as scan and select. Or, the student can divide the navigation tasks by pointing to a choice on a touchscreen to select it, then use a button or switch to click the choice.

Keyboards. Arguably unchanged since they became popular 120 years ago, the keyboard is often a burden for those with a disability. AT keyboard designs vary widely including those with larger but fewer keys, flexible rubber-covered keys, color-coded keys, and onscreen keyboards that work well with touchscreens. Each alternate keyboard has its advantages and drawbacks, but since keyboards will most likely be the main communication between a student and the computer, expanding the reach of the keyboard interface to include students with disabilities is time and money well spent.

One of the most versatile keyboards (and expensive at \$400) is the *IntelliKeys*® keyboard (by IntelliTools). It is an unusually durable alternative, especially for children

who benefit from a very limited set of choices. This keyboard is essentially a blank slate upon which an overlay is placed. The overlay can be a commercial product designed for a specific software program or it can be programmed, providing a finite set of letters, numbers, words, or pictures to represent the choices on the screen. Because the *IntelliKeys*® keyboard is completely customizable, the teacher can create overlays for the keyboard to match social studies content or for use with software programs that teach skills, such as map reading; sorting concepts into categories; and timelines, charts and graphs.

There are also social studies software programs available that include their own set of overlays matching what the student sees on the screen. For example, *Animal Habitats* (recommended for grades PreK -1) and *Ready Made™ Lewis & Clark* (grades 3 -5) could be used, allowing interaction with little more than mouse clicks or customized keyboard commands.

Adjustments to Existing Input Devices. Since a computer's default settings are rarely appropriate for younger students or those with disabilities, it is worth exploring the variations of keyboard and mouse performance in the operating system before purchasing any new AT equipment. Something as simple as altering the way the computer interprets keystrokes can make an important difference for many students. For students with limited fine motor skills who may press more than one key at a time the "sticky key" feature is another effective alternative. Other keyboard preferences include audible and onscreen visual cues, and "slow keys"—where a key must be held down for an adjustable amount of time before being accepted by the computer. Check the control panel for the

Accessibility Options folder on a Microsoft Windows computer or Apple's Easy Access for help. Teachers can also explore additional options for each operating system online at Microsoft and Apple's web sites. Many additional options not commonly bundled with the original operating systems are available for download at Microsoft and Apple's web sites.

Adjusting the mouse settings to slow down the tracking speed or to decrease the double-click speed, can increase a student's chance of success the first time they point and click on a target. Many mice come with software enabling even greater customization of the mouse's capabilities. The Universal Access preferences of Apple's OS X or Microsoft Windows's Accessibility Wizard (found in the Accessibility folder of the Accessories listed in the Programs menu) provide additional features to help students with motor-skill disabilities use a traditional keyboard as well as adaptations for visual impairments, hearing difficulties, and motor control.

Output Devices

Sight. Both the Windows and Macintosh operating systems have built-in controls to help students with special needs better see text and images on the monitor. For example, the accessibility feature in Windows called *Magnifier* opens a separate window showing a greatly enlarged view of the cursor's location, which makes it easier to click on small targets. Other possible adjustments in the computer's operating system include screen color choices, contrast, and screen refresh rate (flicker), which is important if the student is photosensitive or has epilepsy. Both Apple and Microsoft have websites

detailing information about various accessibility features within their operating systems and also links to third party AT solutions.

Sound. Sound, one of the most basic output sources, is often overlooked or deliberately shut off in instructional settings muting the sound. This is useful because of the distraction computer beeps and robotic voices have on the rest of the class. Headphones can help, but some classroom reorganization is usually needed to reduce the distraction of a talking computer.

For more than a decade Apple computers have included software to read text aloud. Another more powerful option is *IntelliTalk II*® software (by IntelliTools) which offers an easy-to-use text-to-voice word processor that pronounces letters, words, sentences, and paragraphs. With a little practice, students with limited visual capabilities or cognitive disabilities can “write” using text, sounds, and pictures. The software can also read aloud imported text from almost any source including text copied and pasted from other sources such as the Internet. Social studies students with reading disabilities can copy text directly from the Internet or from multimedia applications, paste it into the talking word processor, and then listen to the computer read the text to them. Although not a perfect system, it does allow the student greater access to the text-filled world of the Internet, electronic encyclopedias, and other electronic texts.

Software Options

Adapt for Access. It is not always necessary to purchase new hardware to solve AT problems. Often, there is software available to adapt programs or existing hardware

to the needs of the student. For example, *ClickIt!*® (by IntelliTools) can be used in conjunction with other software programs to drive the programs with button clicks or hotspots on the IntelliKeys keyboard.

In addition to offering AT hardware, *Riverdeep* makes several software programs addressing social studies content. Each program contains built-in “Universal Access,” allowing for seamlessly integration between the software and a touchscreen. The software can also be set to work with a single button click as when the choice is highlighted during the cycling through of all possible selections. Other innovative AT software solutions include *CrossScanner*, which allows the user to press a single button to move the mouse cursor vertically, then select from the possible choices along any horizontal line. *SmartClick* activates a mouse click when the cursor hovers over a location for a set amount of time. Finally, there is a product called *SloMo* that reduces the operational speed of any software application or game (all three softwares by R.J. Cooper).

Many More Options

As time goes on, once expensive AT devices will appear in more mainstream social studies classrooms. For example, a fairly inexpensive combination digital camera/software program, Riverdeep’s *TouchFree Switch*, already enables students to operate computers with no more than the blink of an eye or the wiggle of a toe.

A digital camera is another tool of empowerment in a child’s hands. Digital cameras can be used to take pictures of social studies materials or field trips. The pictures are then easily imported into word-processed documents, *PowerPoint* slides, or an

overlay maker, creating custom-designed or personalized worksheets, presentations, or keyboard overlays. The simplicity of the digital camera also lets students photograph their own work, providing insights to the teacher as to what the student views as important. Digital cameras can be integrated into alternative assessment strategies in several ways including having students take pictures that demonstrate relationships between concepts or ideas.

Conclusion

Because disability-specific assistive technology is rarely found on store shelves or even in computer equipment catalogs, it often falls to the social studies teacher to seek out AT solutions for his or her students (see Appendix A for a list of assistive technology resources). In addition to these resources, many school districts have a technology coordinator who may be of help, and some states have an assistive technology demonstration center where you can try out different AT hardware and software before buying (see the RESNA Technical Assistance Project website located in Appendix A).

For many students with special needs, technology is an agent of empowerment and inclusion “offering students a different way of looking at themselves and their capabilities and providing teachers with a new set of tools to support growth and learning” (Male, 2003, p.1). The skills students develop while using assistive technologies such as those outlined in this article can translate into academic success, classroom participatory skills, and preparation for meaningful participation in civil life (Male, 2003). With the abundance of AT devices and software available, the elementary social studies classroom is truly accessible for all students.

Contributors

Martin Horejsi is Assistant Professor of Science Education and Instructional Technology at Idaho State University. Dr. Horejsi teaches undergraduate and graduate courses in science methods, research and writing, statistics, instructional design, multimedia development, and technology integration. His research interests and special projects include probeware and real-time data collection in science education with special focus in the space sciences.

Beverly Ray is Assistant Professor of Teacher Education at Idaho State University, Pocatello, Idaho.

References

- Bodine, C. (2003). What is assistive technology? *The Exceptional Parent*, 33, 32-34. Retrieved March 18, 2004 from <http://vnweb.hwwilsonweb.com>.
- Bryant, Dianne P. & Bryant, Brian R. *Assistive Technology for People with Disabilities*. Boston: Allyn & Bacon. 2 –3.
- Dewey, J. (1944). *Democracy and education*. New York: Macmillan.
- Horejsi, M. (2003). Making technology inclusive. *Science & Children*, 41(3), 2- 24.
- Lindsay, B., & Justiz, M. J. (2001). The landscape for conceptual and policy issues. In: B. Lindsay & M. J. Justiz (Eds.), *The quest for equity in higher education: Toward new paradigms in an evolving affirmative action era* (pp. 3-29). Albany, NY: State University of New York Press.
- Parker, W. (2001). *Social studies in elementary education*. Upper Saddle River, NJ: Merrill/Prentice Hall.
- National Council for the Social Studies. (2001). Creating effective citizens: A position statement of the National Council for the Social Studies. *Social Education*, 53, 255 – 258.
- National Research Council. (1996). *National Science Education Standards*. Washington,

- D.C.: National Academy Press.
- Male, M. (2003). *Technology for inclusion: Meeting the special needs of all students*.
Boston: Allyn & Bacon.
- Maxim, G. W. (2003). *Dynamic social studies for elementary classrooms*. Upper Saddle
River, NJ: Merrill/Prentice Hall.
- Silva, D. Y. & Mason, T.C. (Summer 2003). Developing pedagogical content
Knowledge for civics in elementary teacher education, *Theory and Research in
Social Education*, 31(3), 366-395.
- Willamson, I., Gonzales, M. H., & Avery, P. G. (Spring 2003). Collectivistic values and
individualistic language as predictors of citizenship activities among high school
students. *Theory and Research in Social Education*, 31(2), 203-217.

Appendix A

Assistive Technology Information and Organizations

ABLEDATA

www.abledata.com

Alliance for Technology Access

www.ataccess.org

The Association for Educational Communications and Technology

www.aect.org

The Center for Applied Special Technologies

www.cast.org

Closing the Gap

www.closingthegap.com

RESNA Technical Assistance Project (AT resources by state)

128.104.192.129/taproject/at/statecontacts.html

Virginia Assistive Technology System

www.vats.org

Virtual Assistive Technology Center
www.at-center.com

Companies Offering Assistive Technologies

Apple Computers: People with Special Needs
www.apple.com/disability

IntelliTools
www.intellitools.com

Kensington
www.kensington.com

Keyboard Alternatives and Vision Solutions
www.keyalt.com

Logitech
www.logitech.com

Macally
www.macally.com

Microsoft Accessibility: Technology for Everyone
www.microsoft.com/enable

Riverdeep
www.riverdeep.net

R.J. Cooper
www.rjcooper.com

Touchscreens

The Magic Touch
www.magictouch.com

Touch Screens, Inc.
www.touchwindow.com

Troll Touch
www.trolltouch.com