

Technology: Is It Accessible to All Students?

by

Patricia Hendricks and Jennifer Daley
Temple University

Technology is a valuable resource that can enhance student academic achievement by supporting rigorous academic explorations, delivering curriculum, simulating real world problems, and maintaining student collaboration. However, with all of its benefits, technology may not be accessible to all students, particularly those with physical and mental disabilities. This Techno-Brief will discuss some common accessibility problems with instructional software and online content and outline alternative instructional strategies and accommodations that educators can employ to overcome these problems.

Two underlying philosophies guide these recommendations: All students can become independent learners, and all students need to experience technology integration because multimedia and digital content can help all learners achieve academic success.

Additionally, the recommendations for this Techno-Brief are built on the Universal Design for Learning (UDL) principles. UDL challenges old assumptions about teaching and learning in four fundamental ways:

- Students with disabilities fall along a continuum of learner differences rather than constituting a separate category;
- Teacher adjustments for learner differences should occur for all students, not just those with disabilities;
- Curriculum materials should be varied and diverse including digital and online resources, rather than centering on a single textbook; and
- Instead of “fixing” students so that they can learn from a set curriculum, it should be made flexible to accommodate learner differences (Rose & Meyer, 2002).

Alternative Instructional Strategies

Alternative instructional strategies are behaviors that teachers employ to reach all students in the classroom. Accommodations differ from alternative instructional strategies in that accommodations are not behaviors but tools or things that schools, teachers, and families provide students to help them achieve academic success. Therefore, alternative instructional strategies are teacher behaviors; accommodations are tangible things.

For example, Maryland has instituted regulations and a statute governing schools’ purchasing procedures for technology-based instructional products. These regulations specify that if a technology-based instructional product is not available or would fundamentally alter the nature of the instruction or result in undue burden on the district, it is acceptable to provide “an alternative method of instruction designed to enable a student with a disability to access the general curriculum and meet the student’s IEP goals and objectives as specified in COMAR 13A.05.01.09A” (COMAR, 1999). The purpose of Maryland’s regulations and statutes is to provide all students (including students with disabilities) equivalent access to content and information. If students with disabilities cannot access the same content and information as their peers, they will surely be left behind.

Common Accessibility Problems

The following are four common accessibility problems that often arise in instructional software:

1. Navigation. Students with disabilities may have difficulty using a mouse to navigate through the software.
2. Personal Operating Systems Settings. The software may not recognize the personal operating system settings, such as increased font size, that have been set by a student.
3. Image and Sound. The software may present images that flash too fast or too slow.
4. Incompatibility. The software may not be compatible with screen readers.

Educators should follow a series of steps when reviewing a technology-based learning product. First, they should document the instructional opportunities available in the product as well as the potential problems that their students might encounter. Next, general educators should consult with special educators to consider specific assistive devices that might help their students access the technology-delivered curriculum materials. Then they should consult with the student and their parents or guardians to determine if the student is willing and able to use the device. If an assistive device is unavailable or inappropriate, educators should consult with the technology coordinator to determine if this is the only technology-based product that meets the stated learning goals. Lastly, educators should consider alternative curriculum materials.

Educators often consider pairing students in cooperative learning groups. This solution might be an acceptable instructional strategy if the student with a disability can participate as an equal partner in the learning group. However, if students are paired in cooperative groups to avoid providing each student access to the technology-based information and content, this defeats the objective to let all students become independent learners. Students with disabilities should not be dependent on their peers to access technology-based curriculum and information.

Eliminating the technology-based resource is also an unacceptable solution because it would prevent students from engaging in the multiple learning styles facilitated by such resources.

Questions to Guide Purchasing Decisions

Can a student navigate through the software using only a keyboard (without using a mouse)? If software does not allow the student to navigate the learning environment using only a keyboard, there are many accommodations available. In fact, this may be the easiest accessibility problem to solve because of the wide range of technology accommodations. Educators may offer students alternative input methods such as switches, trackballs, one-handed keyboards, mouthstick or headwand keyboards, and alternative keyboards that plug into a USB port such as the IntelliTools Keyboard.

Does the software override personal operating system settings, accessibility features, or color and contrast settings? This is possibly the most difficult accessibility problem to solve because software usually “takes-over” the student’s computer, ignoring accessibility features and preferences. Some products have built-in customization features. For instance, *IntelliTools Reading* and *A Digital Field Trip to the Rain Forest* allow teachers and students to set accessibility features for individual users. Even though this software does not recognize personal operating system settings, it does offer the same functionality within the learning environment. Another alternative is to consider the student’s needs and abilities while reviewing the resources. A student with mobility difficulties may gain access with an IntelliTools keyboard. A student with low vision difficulties may access the software using a screen reader or ZoomText. Such accommodations allow the students to access the content without using the built-in operating system features.

Does the software present images that flash too fast or too slow? An optically induced seizure may result if the screen flickers too fast or too slow. If an educator suspects that specific instructional software may have a problem, they must request verification from the software producer. Instructional software with a frequency greater than 2 Hz and lower than 55 Hz should not be purchased for any students. There is no accommodation or alternative instructional strategy to fix this problem. Since educators cannot predict who may have a tendency toward seizures, they must avoid software with flickering images.

If the software is not compatible with screen readers such as JAWS for Windows and Window-Eyes, which read aloud (textual) information presented on the computer screen, several accommodations can be made. Testing for compatibility requires teachers to use a screen reader with the instructional content. Again, in this situation, teachers should consider the student’s abilities and needs. If a student’s screen reader does not work with the educational software, a screen magnification system such as ZoomText or BigShot might work. Another alternative is to use a learning system, such as Kurzweil 3000 or WYNN Reader that may work with the chosen instructional software or online content.

Conclusion

If digital content is not accessible to students with physical and mental disabilities, educators may employ instructional strategies and accommodations to help their students access the content. Teachers should first consider their students' capacity and needs and then select software and hardware that might allow access to the digital content. Teachers should also consider teaching strategies and behaviors that may support the learner. However, teachers should not group students unless all they all can participate as equal learning partners.

References

- COMAR (1999). *13A.05.02 Administration of services for students with disabilities*. Retrieved February 2004, from <http://www.msde.state.md.us/technology/comar13a.htm>
- Rose, D. & Meyer, A. (2002). *Teaching every student in the digital age: Universal design for learning*. Retrieved March 2004, from <http://www.cast.org/teachingeverystudent/ideas/tes>