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Leaving No Child Behind in the Digital Age: Technology and High Quality Instruction

by Cindy Richardson

The classroom of the 21st century is composed of students from many different cultural, ethnic, and economic backgrounds demonstrating a wide range of abilities. One of the greatest challenges facing educators in inclusive classrooms is differentiating and delivering instruction for students with varied abilities and experiences in a way that enables all students to succeed in the general curriculum. While technology and digital resources have made their way into classrooms, many educators have yet to take full advantage of the richness of these supports. Often, technology is seen as a separate activity that has been forced upon educators instead of a universally designed tool that can catapult student learning and achievement when effectively integrated into the curriculum.

In the *No Child Left Behind* legislation, not just availability, but integrated use of technology in curriculum and instruction is seen as an essential prerequisite for increasing student achievement. As noted by drafters of this law, technology can only be an effective solution to the challenge of student achievement if it is made an integral part of the learning process. Therefore, a key element of NCLB is a new educational technology initiative — *Enhancing Education Through Technology.* The goals of this initiative are to:

- Improve student academic achievement though the use of technology in elementary schools and secondary schools.
- Assist students in becoming technologically literate by the time they finish the eighth grade.
- Ensure that teachers are able to integrate technology into the curriculum to improve student achievement.

In addition, several components of the NCLB act allow schools to purchase technology resources to support program goals.

Why has technology been identified as a critical component for ensuring that no child is left behind? Computer or digital technology (tools that provide opportunities for the learner to customize and/or interact with the content by manipulating text, sound, images, or video) is the one universally designed curricular tool that can be customized to support the needs of a diverse student population. The traditional curriculum, consisting primarily of textbooks, worksheets, teacher lectures, and paper-pencil tests, leaves many students unable to engage with the material. Indicative of a "one size fits all" philosophy, the rigidity of such an approach almost guarantees that only a small percentage of students will grasp and

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apply knowledge to the extent educators desire using traditional instructional methods and materials (Rose & Meyer, 2002). Consider, for example, the number of students with learning disabilities who are forced to extract meaning from text they cannot read, much less understand, or students with dysfunctional handwriting or spelling who cannot begin to compose a simple paragraph. Although accommodations such as providing notes or reducing work assignments may be helpful at times, to rely on these supports instead of providing students with tools that would allow them to engage with the material in a meaningful and productive way may prohibit the long term gains we desire.

Assistive technology has made it possible for students whose disabilities prohibited their participation in or engagement with typical curricular tasks, such as reading, writing, or oral communication, to engage with the content and respond in a manner that demonstrates competence. While these tools have made it possible for many students to be included in the general curriculum, they are sometimes seen as appropriate for only the neediest of students. In fact, an ever-growing number of students identified as being at risk for failure or whose performance suggests that they are struggling with a curriculum delivered under the traditional model otherwise are often denied access to such supports that could ignite and transform productivity. Likewise, students who are currently using assistive technology as a tool to access a traditionally delivered curriculum are still unable to achieve when technology is fully integrated into the methods and materials used to present information, apply concepts, and foster student engagement. The concept of a universally designed curriculum in which technology is not only available, but is embedded in the instructional methods and materials used to teach all students, has been the focus of research by the Center for Applied Special Technology (CAST).

New brain research reveals that the capacity to learn is not inherent, but rather is determined largely by an exchange between the learner's abilities and the tools and activities in which he or she engages (Rose & Meyer, 2002). Three unique and interconnected networks in the brain help the learner recognize patterns and analyze information, plan and execute strategies, and identify and determine priorities. The application and effective integration of technology affords students with disabilities, as well as their non-disabled peers, opportunities to not only learn essential technology skills valued by potential employers, but also to access, comprehend, and apply content knowledge in meaningful ways. A compilation of studies conducted over the past decade confirm the fact that, when integrated into the curriculum and coupled with active learning strategies, technology can have a dramatic impact on student achievement (Moursund, Bielefeldt, & Underwood, 1997; Stites, 1998).

But how can we effectively integrate technology into the curriculum when many of our classrooms have only one or two computers available? The following examples illustrate how the computer, with appropriate software, can be integrated effectively into the curriculum.

As a Presentation or Teaching Tool: (usually used with a projection unit such as a TV, overhead, or video projector)

- As a tool to help students visualize abstract concepts
- As a tool for presenting new information or clarifying concepts
- As a tool for activating prior knowledge
- As a tool to assess student learning

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- As a way of modeling software use
- As a way of learning content-related strategies
- As a way of modeling the art of writing
- As a way of linking with projects (e.g., webquests, virtual field trips, experts) for project-based or collaborative learning activities

As a Platform for Small-Group Learning:

- As a tool for exploring concepts (e.g., simulation of science experiments or mathematical concepts)
- As a link to online reference materials and resources
- As a tool for problem solving and decision making
- As a resource to plan, design, and showcase learning (project-based assessment)

As a Tool for Individual Student Use:

- As a venue for accessing or engaging with the curriculum
- As an alternative format for an activity (e.g., test, worksheet or experiment)
- As a tool for enrichment
- As a tool for remediation or skills practice

When integrating technology into the universal design of the curriculum, particularly with limited time and resources, the following ideas may be helpful to educators:

- Talk with or observe other educators who are already experiencing success with integrating technology into the curriculum.
- Develop a detailed plan of how the technology and activity selected will support the identified curricular objectives.
- Show one or more examples of what a successfully completed project might look like before introducing a project or assignment to students.
- Model, model, model. . .Use a single computer attached to a large-screen projection unit to teach students every skill they need to know to complete their project successfully. With the class, complete an assignment from start to finish to demonstrate effective ways of organizing, developing, and creating a project.
- Use cooperative learning strategies while still maintaining individual accountability.
- Develop and share with students a timeline for all project segments so that the project continues to move forward in a timely manner.
- Identify offline activities to supplement technology in the event that it becomes unavailable before or during a scheduled activity, or when groups have to rotate their use of the computer.
- For resource material on the topic of software selection or integrating technology with project-based learning, request one of the corresponding Considerations Packets advertised on the T/TAC William and Mary web site.

In recent years, technology has opened the door for many students with disabilities to enter the general education classroom. However, its isolated use to assist students in accessing a traditionally delivered curriculum falls short of achieving the gains possible when technology is embedded in the learning process and materials used with all students. The challenges educators face in providing instruction for a diverse and ever-changing

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population, coupled with the increased emphasis on accountability for student achievement, make technology integration into instructional methods and materials imperative if we are to comply with the mandate to leave no child behind.

Article Resource URLs

No Child Left Behind
http://www.NoChildLeftBehind.gov

Center for Applied Special Technology (CAST)
http://www.cast.org/

T/TAC at William & Mary
http://www.wm.edu/ttac

References

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About the Author

Cindy Richardson, M.Ed., is an assistive technology specialist at the College of William & Mary. She can be contacted at cxric2@wm.edu.