



INFORMATION CAPSULE

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Educational Technology

At A Glance

There is a growing consensus among educators and the general public that technology should play a more integral role in students' education. However, the question of whether the introduction of technology into the classroom has a positive impact on teaching and learning is still under intense debate within the educational community. This Information Capsule lists the strategies researchers have concluded contribute to the success of technology programs and summarizes findings from research conducted on technology programs. Although these studies have produced inconsistent findings, they do suggest that the types of activities students engage in are more important than the frequency with which they use computers. The status of educational technology in Miami-Dade County Public Schools and statewide is also summarized. A more detailed Literature Review on the integration of technology into the curriculum is available at Research Services' Web site (<http://drs.dadeschools.net>).

Over the past 20 years, technology has transformed society and changed many aspects of daily life. The proliferation of technology has led to a growing consensus among educators and the general public that it should play a more integral role in students' education. Schools' use of educational technology has continued to steadily increase over the years, as educators introduce a variety of efforts to integrate technology into the curriculum. In 2003, only 4 percent of U.S. school districts had implemented one-to-one computer programs (in which each student was given a computer for his or her own use). By 2006, more than 24 percent of school districts were in the process of transitioning to one-to-one programs. In 2006, the *America's Digital Schools* report estimated that over 19 percent of all student devices were mobile and predicted that this percent would increase to 52 percent by 2011. In 2008, there were, on average, 3.8 students for every instructional computer in the nation's public schools, compared to 5.7 students per computer in 1999, and 125 students per computer in 1983.

Strategies that Contribute to Technology Programs' Success

The introduction of technology into the classroom doesn't automatically translate into better instructional outcomes. Research has demonstrated that the manner in which technology programs are implemented is equally, if not more, important than the type of technology used. Studies have found that the least effective technology programs were those that simply placed hardware in

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classrooms, with little or no regard for the integration of the technology into the curriculum, issues of equity, or the provision of teacher support. Many factors influence the level of a program's effectiveness, such as the extent to which teachers are trained and prepared to implement the program, the level of student access to the technology, and the provision of adequate technical support. In other words, school districts should build a comprehensive program, not just supply students and staff with machinery.

Researchers have concluded that the following strategies contribute to the success of technology programs:

- Engage in detailed planning prior to implementation of technology programs, including a thorough evaluation of program costs.
- Involve teachers in the planning and implementation of technology programs.
- Provide all students with access to updated software and well-functioning equipment.
- Provide all students, regardless of the school they attend, with equitable access to technological resources.
- Integrate technology into the curriculum.
- Provide strong district and school leadership for the technology program.
- Provide professional development that prepares teachers to integrate technology into the curriculum.
- Provide teachers with adequate technical support.
- Develop partnerships with parents and community stakeholders to gain their support for technology initiatives.
- Evaluate the impact of the technology program on teaching and learning.

Research on Educational Technology Integration

The question of whether the introduction of technology into the classroom has a positive impact on teaching and learning is still under intense debate within the educational community. More studies are needed before major investments in educational technology programs can be justified. Findings from studies conducted on educational technology programs include:

- Technology programs appear to have a positive impact on students' motivation, engagement, self-directed learning, and peer collaboration. Studies have also linked the introduction of technology to increased attendance rates and fewer disciplinary referrals.
- Most studies have concluded that the use of technology has a positive impact on students' writing skills, but findings have been inconsistent regarding technology's impact on reading, language arts, math, and science performance.
- The types of activities students engage in are more important than the frequency with which they use computers.
- Some studies have associated higher frequencies of school computer use with lower levels of academic performance and higher frequencies of home computer use with higher levels of academic performance. However, other factors, such as family background, school resources, and the types of activities students engage in with computers, appear to play a role in determining the impact of technology on student performance.
- Teachers' attitudes and beliefs about technology influence the types of activities they use technology for and how often they integrate technology into the curriculum.
- The introduction of technology into the classroom has been found to affect both teaching style and the quality of student-teacher interactions.
- Obstacles to effective technology integration most frequently cited by teachers include lack

of preparation and practice time, equipment problems, and insufficient professional development.

- The amount and type of professional development teachers receive is related both to student outcomes and to how prepared teachers feel they are to use technology in the classroom.

On A Local Note

M-DCPS' *Comprehensive Instructional Technology Blueprint* is the framework and plan of action for using technology to provide the district's students with the highest quality education. In addition, individual technology initiatives are being implemented at schools throughout the district. A feasibility study, conducted by the Office of Performance Improvement, in collaboration with the Division of Instructional Technology, concluded

that the district should first investigate the impact of its existing technology before committing the significant resources needed to implement a large-scale laptop program. The findings contained in this Information Capsule support this conclusion. M-DCPS staff responses to the *Florida Innovates Technology Survey* indicated that many schools feel they have inadequate funding to purchase hardware and software, but that most schools are receiving acceptable levels of technical support. At the state level, Florida earned an overall grade of B on Education Week's *Technology Counts 2008* assessment of technology policy and practice. The nation as a whole earned an overall grade of C+. Florida also earned higher grades than those for states surveyed nationwide in all three core areas of technology policy and practice.

A Literature Review that provides a more detailed summary of research conducted on the integration of technology into the curriculum is available at Research Services' Web site (<http://drs.dadeschools.net>). The Literature Review includes a description of each strategy that has been found to contribute to the success of technology programs and a more thorough summary of research conducted on educational technology programs. Studies are divided into the following categories: most effective types and uses of technology; availability of technology; technology's effect on students' behavior; technology's effect on students' academic achievement; technology's effect on teachers; and professional development's effect on teaching and learning. The Literature Review's On A Local Note section provides more detailed information on the status of educational technology in M-DCPS and statewide. A full listing of references is also included.

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