



**Additional briefs include:**

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and Teacher Effectiveness

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## Promotion of Curricula and Teaching Strategies That Integrate Technology

*Local technology applications and plans should include a description of how the applicant will identify and promote curricula and teaching strategies that integrate technology effectively into curricula and instruction, based on a review of relevant research and leading to improvements in student academic achievement.*

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### Overview

A review of relevant research to justify strategies for effective technology integration shows mounting evidence that educational technology can have a positive impact on student achievement (Honey, 2002; Valdez et al., 2000). Organizations such as the Center for Applied Research in Educational Technology (CARET) have Web sites that provide ready access to some of the best available research. Identifying relevant research and using it to promote strategies that effectively integrate technology into curricula and instruction is critical; by strategically planning and promoting technology integration at the curriculum development stage, schools and districts can align both technology and curriculum directly to teaching strategies and therefore stand a better chance of achieving effective technology integration from classroom to classroom across the organization.

#### Key Questions to Consider

- How will you identify curricula and teaching strategies that integrate technology effectively and lead to improvement in student academic achievement?
- How will you promote the use of these curricula and teaching strategies that integrate technology effectively in your district?

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## Strategies for Addressing Local Technology Applications and Plans

### *Identifying Curricula and Teaching Strategies*

Recognizing the limitations of this growing body of research, districts must design their own processes to make technology selection an integral part of their curriculum and professional development strategies and must develop assessment routines that will demonstrate the value of the curriculum and teaching strategies which have been enriched by technology. Fortunately, this work can be facilitated by Web sites where content has been carefully screened and categorized for K–12 schools by experts in subject matter and pedagogy.

Some specific strategies that experience has shown to be useful to district leaders:

*“With ever-increasing choices for both technology (i.e., films, video, multimedia, or Internet) and content, the need is unprecedented for thoughtful, purposeful use, carefully aligned with complementary classroom instruction and desired learning outcomes.”*  
(Marshall, 2002)

1. Many districts are now recognizing that the ideal time to plan for the integration of technology is during curriculum-specific revision cycles. When revising the curriculum in a specific subject area, for example, mathematics, the committee that is charged with this revision can also be specifically charged with looking into the selection of technologies and teaching strategies to support teaching and learning in this subject area. For this reason, districts might consider including individuals experienced with the application of technology in the particular curriculum area in the committee. (District-based experts and outside experts are both helpful.) Decisions on curriculum can then reflect the selection of printed materials, software, and online resources as well as the teaching strategies that support their use. Excellent subject-specific resources are available; some of these are listed below.
2. Many districts have created positions such as that of instructional technology specialist. This person focuses on supporting teachers in matching technology to curriculum needs and in developing teaching strategies that make the best use of the technology and are most likely to maximize student learning. These positions are sometimes called TPDs (Technology Professional Development specialists) or technology integration specialists.

3. School-based teams of teachers (e.g., math department, third grade teacher team) are excellent vehicles for identifying online resources and software applications that enrich the curricula that they are teaching. These teacher teams can offer mutual support as they become more familiar with technology and learn about the links between their curriculum and specific technologies. They can learn from and share their experiences in working with technology with their students. One approach for this kind of collaborative work utilizes “action research,” a term that is used to describe research methodologies which pursue both action and critical reflection/understanding (Dick, 1999; Reason & Bradbury, 2001).

#### *Promoting Curricula and Teaching Strategies*

Many approaches are being used by districts to promote curricula and teaching strategies that integrate technology. Districts are designing and adopting both policy-oriented and support-oriented approaches.

Policy-oriented approaches are those adopted by a school or district at the initiative of the administration or a faculty committee. These approaches set the parameters for decisions made by teachers. They include:

- adoption of specific curricula with technology components;
- inclusion of technology criteria in teacher (and principal) evaluation instruments; and
- inclusion of technology criteria in a teacher's individual professional development plan.

Support-oriented approaches are those that focus on encouragement of teachers by peers (e.g., colleagues, mentors, or individuals with roles such as the TPD) to examine, and consider changing, existing teaching practice. These approaches include co-planning, co-teaching, and modeling of units by more experienced teachers, as well as more traditional approaches such as workshops during and after school and summer institutes. Increasingly, districts are aiming to focus support-oriented approaches on specific educational objectives closely related to a teacher's responsibilities, avoiding one-size-fits-all workshops.

The experience of many districts indicates that the most effective way to promote the adoption of new curricula and teaching strate-

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gies for effective technology integration includes both kinds of approaches—policy-oriented and support-oriented.

## Extended Resources

Marco Polo website

<http://marcopolo.worldcom.com/>

This site links to six content-specific sites: mathematics, humanities, science, arts, geography, and economics. Each subject-specific site presents carefully selected Internet-based activities linked to national standards. In mathematics, for example, the site has been developed and is hosted by NCTM; similar professional organizations host the other sites and are responsible for evaluating all content.

*Exemplary and Promising Educational Technology Programs 2000*

<http://www.ed.gov/pubs/edtechprograms/>

The final report of the Expert Panel on Educational Technology, appointed by the U.S. Department of Education. The panel conducted a national competition to identify exemplary and promising programs. Seven were identified through this process and are described in this report.

*National Educational Technology Standards for Students (NETS•S)*

<http://cnets.iste.org/index2.html>

The standards contain examples of effective technology use in all subject areas.

Project MEET professional development program

<http://meet.terc.edu/public/TPDS/tpdrole.cfm>

A description of a training program for Technology Professional Development specialists.

Good Models of Teaching with Technology (GMOTT)

<http://knowledgeloom.org/gmott/index.jsp>

A conceptual framework that helps teachers and curriculum leaders identify effective uses of technology; it has been developed by TERC based on Jonassen, D.H., Peck, K.L, Wilson, B.G & Pfeiffer, W.S. (1999), *Learning with technology: A constructivist perspective* (Upper Saddle River, NJ: Prentice Hall).

Means, B., Penuel, W., & Padilla, C. (2001). *The connected school: Technology and learning in high school*. (San Francisco: Jossey-Bass).

A recent research study that presents a conceptual framework, “Student-Empowering Uses of Technology,” similar to GMOTT.

Knowledge Loom Spotlight

<http://knowledgeloom.org/gmott/>

Created by NEIRTEC, this site highlights the GMOTT conceptual framework in the context of real classrooms.

## References

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Technology Briefs for NCLB Planners can be obtained by visiting <http://www.neirtec.org>.

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