

Changing the Way We Do Business: Technology and Teacher Education

Presented by

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Why Technology & Teacher Education

- Access to the Curriculum
 - Reading
 - Writing
 - Content
- Universal Design for Learning
- Empowerment
- Self-Determination
- Collaboration
- Progress Monitoring
- Data Driven Decision Making

Technology - Research

- Edyburn's - Year in Review: A Synthesis of the Special Education Technology Literature - <http://jset.unlv.edu>
- National Assistive Technology Research Institute - <http://natri.uky.edu/>
- Don Johnston - <http://www.donjohnston.com/research/>
- Read 180 - <http://teacher.scholastic.com/products/read180/research/>
- Center for Implementing Technology - <http://www.cited.org/>

Technology Mandates

NCLB - The portion of the No Child Left Behind (NCLB) Act known as 'Enhancing Education Through Technology Act of 2001' (E2T2) has a goal: To assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes the eighth grade, regardless of the student's race, ethnicity, gender, family income, geographic location, or disability.

IDEA - As part of the IEP planning process, IDEA mandates that the assistive technology needs of all students be considered [P. L. 105-17, Section 1414 (d)(3)(B)(v)].

Technology and Teacher Education - Research Findings/Framework

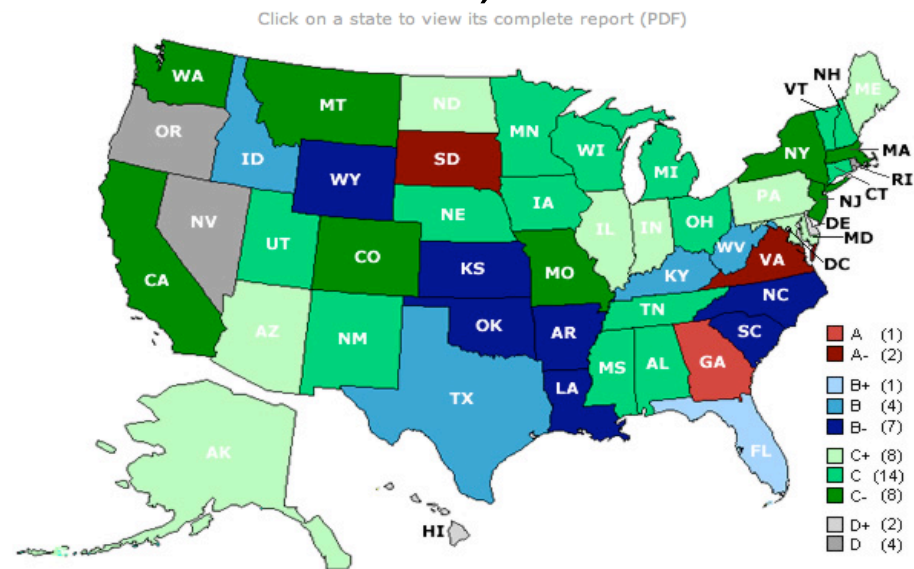
1. What have we learned about technology and teacher education?
2. How to technology standards apply to this research?

Resources to Consider

- Ed Week's Technology Counts
 - <http://www.edweek.org>
- IES's National Center for Educational Statistics
 - http://nces.ed.gov/pubs2003/tech_schools/
- CEO Forum on Education & Technology
 - <http://www.ceoforum.org/>
- QIAT - Quality Indicators for AT Services
 - <http://sweb.uky.edu/~jszaba0/QIAT.html>

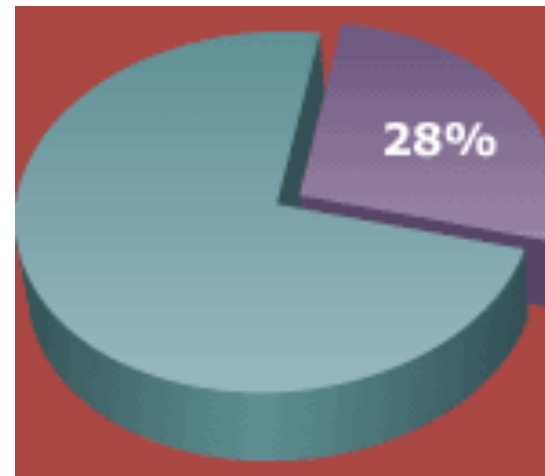
Are we there yet?

The findings in this survey are based on telephone interviews with technology decision makers in 811 school districts, including 90 of the largest 100 districts (more than 25,000 students), 398 medium-sized districts (2,500 to 24,999 students) and 323 small districts (up to 2,499 students).



Instruction in Cyberspace

Percentage of district leaders who say that at least one in five students soon will receive a substantial portion of their instruction via the Internet.



How do district teachers use the Internet for instructional purposes?

Percentage of respondents

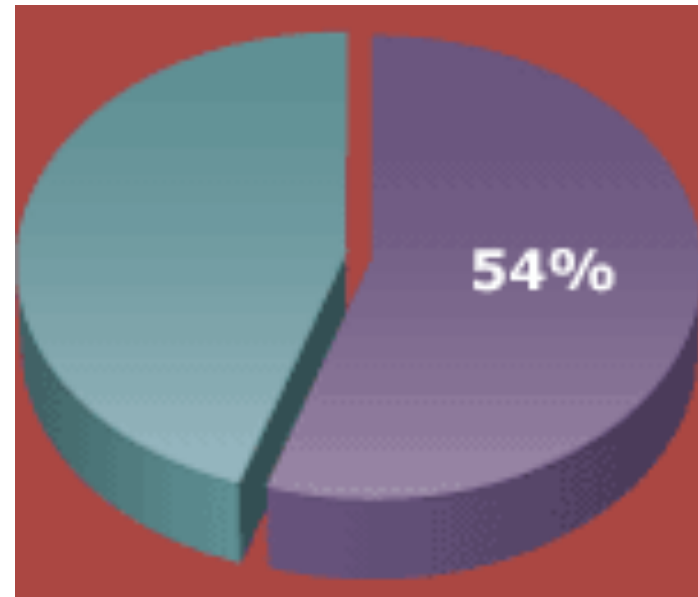
- Internet searches 74%
- Teacher research 72%
- Lesson planning 38%
- Demonstrations, presentations 18%
- Utilizing Internet services 10%
- Student projects 8%
- Student research 7%
- E-mail 5%
- Videoconferencing 5%
- Class Web pages 4%
- Student information services 3%
- Other (distance learning, desktop publishing) 5%

Grunwald, P. & Associates, & Rockman (2002)

Students offering technical support

Percentage of districts reporting that students are providing technical support within their district (54%)

Are students providing tech supports?	Large Districts	Medium Districts	Small Districts
Yes	61%	53%	54%
No	38%	46%	45%



Grunwald, P. & Associates, & Rockman (2002)

Teacher Technology Comfort

Rate new teachers in skills and knowledge necessary to integrate the Internet into instruction.

	L	M	S
Novice	36%	25%	24%
Average	43%	42%	40%
Above Average/Expert	18%	31%	35%

Grunwald, P. & Associates, & Rockman (2002)

Conditions for Technology Integration

The primary purpose of the study was to address “why don’t teachers innovate when they are given computers?” and “why don’t teachers integrate computers in their teaching in more meaningful ways?”

- 118 K-12 teachers in Michigan were awarded funds to innovate with technology in their classrooms.

Technology Innovations

Researchers administered a survey designed to assess six factors identified by prior studies as relevant to technology integration:

- technology proficiency;
- computer anxiety;
- attitudes and beliefs toward technology in education;
- previous and planned professional uses of technology; and
- pedagogical styles

Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. (2002)

Technology Innovations

Three characteristics of teachers that were significantly linked with successful integration of technology innovations were:

1. Technology Proficiency in using hardware and software, and in understanding the conditions that support technology use. For example, one project in this study called for computer video conferencing between 3rd graders with students from other schools. Although the teacher knew which software she needed to use, she had little knowledge of the technical infrastructure required to set up the whole system, such as high-speed Internet connections and digital cameras. This project was never implemented (p.9).

Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. (2002)

Teacher Implications

2. Compatibility of teaching style, content, and the software and hardware. The study found that teachers who saw an intimate connection between the selected technology and their curriculum were more likely to implement their innovations successfully.
3. Social awareness of the school culture and organization. “For example, one teacher’s project required frequent use of the single, school-wide computer lab. This teacher successfully implemented her project because she was aware of the technology use patterns of other teachers, which enabled her to plan lessons and use of the lab accordingly” (p.15). Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. (2002)

Implications for schools - Tech Integration

Enable teachers to select technologies that will easily integrate into their teaching style and the school culture.

Provide opportunities for in-service and pre-service teachers to reflect upon their attitude toward computer technologies, and to clarify their preferred instructional strategies.

Provide hands-on practice with the integration of technology and curriculum objectives.

Enable teachers to understand the value of using technology as a means rather than as an end.

Take small, evolutionary steps when integrating technology with curricula, so teachers may experience success rather than frustration with the technology.

Provide Internet connections in classrooms, rather than in computer labs that must be reserved far in advance.

Identify and enable mentors who can model technology integration and provide guidance specific to the curriculum needs of the teacher/learner.

Will we know it when we see it?

The purpose of the study was to describe the integration of technology in classrooms of two groups of K-8 teachers:

1. Experienced teachers - trained in the use of technology (PT3)
2. Novice teachers - al graduates of a technology-rich teacher education program.

Will we know it when we see it?

- 46 teachers (18 experienced and 28 beginning)
 - Beyond surveys
 - Observations - Integration of Technology Observation Instrument (ISTE, 2003)
 - Examined technology rich curriculum units

Findings - Beginning Teachers

- Used the computer more extensively (such as PPT)
- Students used productivity tools and the Internet research tools less than the students in classrooms of experienced teachers.
- Students used fewer applications.
- Teachers were observed doing more direct instruction of a technology tool.
- Students tended to use one technology tool (e.g., WP) to accomplish an assignment.

Findings - Experienced Teachers

- Arranged longer term projects in which students used many technology tools to meet the assignment requirements.
- Teachers were observed doing less direct instruction and more coaching as students used technology to work on research projects and papers.
- Classrooms used combination of tools to complete their projects

Summary of Findings - General Teacher Education & Technology Research

Technology applications should be integrated into pre-service teacher assignments and activities.

Site-based practicum in an elementary school provides pre-service elementary teachers with experience using technology with students.

Pre-service teachers benefit from learning in small groups of 8 to 12.

Fifty-minute modules for technology instruction in a computer lab with a video projector addresses oral, visual, and kinesthetic learning styles and enables the instructor to quickly respond to student needs.

Proactive instructor support with pre-service teachers reflects commitment and a collegial relationship among faculty and students.

Elements of the course that were problematic prepared pre-service teachers to acknowledge that "learning with technology is messy"

Future Implications

- NCLB & IDEA
- Teacher Education - Standards
 - CEC - Common Core
 - CEC - Knowledge and Skill
 - ISTE - International Society for technology and Education
 - NETS - T - National Educational Technology Standards - Teacher

CEC - SPED Technology Specialist

Knowledge and Skill Base for Special Education Technology Specialists

1. Foundations
2. Development and Characteristics of Learners
3. Individual Learning Differences
4. Instructional Strategies
5. Learning Environments and Social Interactions
6. Language
7. Instructional Planning
8. Assessment
9. Professional and Ethical practice
10. Collaboration

ISTE - NETS - T

1. Technology Operations and Concepts
2. Planning and designing Learning Opportunities and Experiences
 - A** design developmentally appropriate learning opportunities that apply technology-enhanced instructional strategies to support the diverse needs of learners.
3. Teaching, Learning, and the Curriculum
 - B** use technology to support learner-centered strategies that address the diverse needs of students.
4. Assessment and Evaluation
5. Productivity and Professional Practice
6. Social, Ethical, legal, and Social Issues
 - B** apply technology resources to enable and empower learners with diverse backgrounds, characteristics, and abilities.
 - C** identify and use technology resources that affirm diversity

Final Thoughts

Expand our understanding in how to equip pre-service and in-service teachers with technology skills that will transfer to integration/implementation.

- o Research that offers concrete data.
- o Research that is focused on teachers of students with special needs.

Consider altering CEC Common Core and Knowledge and Skill Standards to include technology in a manner representative of current and future needs.

References

- Cradler, J., Freeman, M., Cradler, R., & McNabb, M. (2002). Research implications for preparing teachers to use technology. Learning & Leading with Technology, 30(1), 50-54.
- Grunwald, P. & Associates, & Rockman (2002). Are we there yet? Alexandria, VA: National School Board Foundation. Retrieved February 17, 2003, from <http://www.nsb.org/theyet/fulltext.htm>.
- Wetzel, K. (2004). Technology integration: Will we know it when we see it? Paper presented at the National Educational Computing Conference, San Antonio, TX.
- Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. (2002). Conditions for classroom technology innovations: Executive summary. Teachers College Record, 104 (3) 482-515. Retrieved July 4, 2002, from <http://www.tcrecord.org/Collection.asp?CollectionID=77>.