EVALUATION OF THE TEXAS TECHNOLOGY IMMERSION PILOT

An Analysis of Baseline Conditions and First-Year Implementation of Technology Immersion in Middle Schools

EXECUTIVE SUMMARY
DECEMBER 2006

Prepared for
Texas Education Agency

Prepared by
Texas Center for Educational Research

Credits

Texas Center for Educational Research

The Texas Center for Educational Research (TCER) conducts and communicates nonpartisan research on education issues to serve as an independent resource for those who make, influence, or implement education policy in Texas. A 15-member board of trustees governs the research center, including appointments from the Texas Association of School Boards, Texas Association of School Administrators, and State Board of Education.

For additional information about TCER research, please contact:

Kelly S. Shapley, Director
Texas Center for Educational Research
12007 Research Blvd.
P.O. Box 679002
Austin, Texas 78767-9002
Phone: 512-467-3632 or 800-580-8237
Fax: 512-467-3658

Reports are available at www.tcer.org and www.etxtip.info

Contributing Authors

Texas Center for Educational Research
Kelly Shapley, Ph.D.
Daniel Sheehan, Ed.D.
Keith Sturges, M.A.A.
Fanny Caranikas-Walker, Ph.D.
Briana Huntsberger, M.P.Aff.
Catherine Maloney, Ph.D.

Prepared for

Texas Education Agency
1701 N. Congress Avenue
Austin, Texas 78701-1494
Phone: 512-463-9734

Research Funded by

U.S. Department of Education

Executive Summary

The Texas Education Agency (TEA) used Title II, Part D monies to fund a wireless learning environment for high-need middle schools through the Technology Immersion Pilot (TIP). A concurrent research project funded by a federal Evaluating State Education Technology Programs grant is scientifically evaluating whether student achievement improves over time as a result of exposure to technology immersion. Technology immersion encompasses multiple components, including a laptop computer for every middle school student and teacher, wireless access throughout the campus, online curricular and assessment resources, professional development and ongoing pedagogical support for curricular integration of technology resources, and technical support to maintain an immersed campus.

The study of technology immersion employs a quasi-experimental research design with middle schools assigned to either treatment or control groups (22 schools in each). While the overarching purpose of the study is to scientifically test the effectiveness of technology immersion in increasing middle school students' achievement in core academic subjects, the evaluation also aims to examine the relationships that exist among contextual conditions, technology immersion, intervening factors, and student achievement. Data gathered through site visits to all participating middle school campuses in fall 2004 and spring 2005 allowed an in-depth examination of campus conditions, school and classroom activities, and educational roles and processes through interviews with key personnel, focus groups with teachers and students, inventories of technology resources, and reviews of documents. Major findings from the first year are summarized below.

Baseline Characteristics of Middle Schools

Fall site visits allowed researchers to gather data on existing conditions to establish the comparability of treatment and control campuses prior to immersion. We documented the nature of technology access, technical and pedagogical support, teachers' prior participation in technology-related professional development, and technology use by teachers and their students.

Technology Access. Technology access was meager at both treatment and control campuses in fall 2004. Teachers, on average, had few computers in their classrooms (less than three) and few technology resources, such as printers and LCD projects. Computers were typically located in computer labs, technology applications classrooms, or libraries, and scheduling difficulties, according to teachers, restricted access to those locations. Technical problems caused by outdated and inoperable equipment and campus network and Internet troubles also thwarted teachers' technology use.

Technical and Pedagogical Support. Although the extent and configuration of technical and pedagogical support varied across treatment and control campuses, most had general technical assistance and at least some support for curricular integration. Both treatment and control campuses faced similar technical support challenges, and ongoing technology problems created barriers to access and use.

Professional Development. Technology-related professional development was widely available to most teachers, but the training content generally focused on computer literacy rather than curricular integration. Teachers at treatment and control campuses experienced similar technology professional development needs, barriers to participation, and interest in one-on-one assistance. Teachers wanted ongoing personal support for curricular integration from trainers with practical classroom experience.

Teacher and Student Technology Use. In fall 2004, teachers seldom incorporated technology into their lessons because they had few computers in the classroom. Many teachers, however, routinely used technology for administrative purposes such as keeping grades and reporting attendance. Students at both treatment and control campuses had similar technology access and used technology in comparable ways (e.g., educational programs, Internet-based research, and electronic presentations).

Initial Steps toward Technology Immersion

Considering that activities undertaken by districts and campuses in the early phases of a school reform initiative may influence subsequent progress toward institutional change, we asked educators at immersion campuses to describe their early efforts.

Staff Involvement in Decision Making. The absence of broad-based participation in decision making threatened buy-in for TIP projects. In most cases, the timing of competitive grants diminished possibilities for staff participation in the application process. At about a third of middle schools, principals were not involved in the grant application, and at most campuses, teachers were not consulted about the decision to apply for TIP grants.

Vendors, Policies, and Funding. Because technology immersion requires the coordination of the delivery of hardware, software, and sustained professional development, initial progress toward immersion hinged on establishing supportive and dependable relationships with vendors. Yet early in the project, educators' perceived levels of support from vendors varied from campus to campus. Additionally, almost all campus principals in fall realized that they had to address policy and funding issues associated with technology immersion, but limited time for planning meant that leaders generally had to generate solutions as needs arose during project initiation.

Readiness for Immersion

Many campuses in fall were unprepared to undertake a whole-school technology initiative. Lack of readiness was evidenced notably in school personnel's capacity, proficiency, attitudes, and understanding of technology immersion.

Capacity of Technical Staff. A shortage of well trained and capable staff jeopardized prospects for adequate technical and pedagogical support at many campuses. Technology coordinators, especially at small campuses, believed that technical staff was already spread thin and that, without additional personnel, adequate support for immersion would be difficult.

Teacher Readiness. Teachers' limited technology proficiency in fall was viewed as a potential hindrance to technology immersion. Many teachers lacked basic troubleshooting skills and had even less ability and experience with technology integration. Additionally, teachers' commitment to technology immersion was tempered by their anxiety about the increased work load as well as their uncertainty about the immersion concept. Teachers' enthusiasm for immersion most often stemmed from their perceived benefits for students.

First-Year Implementation of Technology Immersion

Between March and May 2005, researchers conducted follow-up site visits to each of the treatment and control campuses. Site visits to control campuses verified that little had changed since fall visits. Technology access and use remained virtually unchanged and campuses continued to pursue their previously declared educational missions.

Implementation of Immersion Components. At treatment campuses, researchers assessed the implementation of grant-specified components of technology immersion (i.e., robust access, technical and pedagogical support, professional development, and resource utilization). Overall findings showed that none of the campuses had fully implemented the immersion components in the first year.

Robust Access to Technology. Due to delays in laptop rollout, the amount of time students had their laptops varied by campus (from 72 to 138 days), with many students having less than four months of laptop use. Moreover, some campuses restricted students' access to their laptops outside of school. Older middle school buildings also caused access problems because many did not support the infrastructure demands of technology immersion. Technology access also was affected by ongoing software, Internet, and hardware maintenance issues.

Technical and Pedagogical Support. Many districts and campuses had difficulty meeting the technical demands of immersion. Even though the grant required each campus to provide dedicated technical support, the level of support varied widely during first-year implementation. Pressing technical requirements also diminished staff capacity to provide campus-based pedagogical support. Thus, teachers who generally failed to receive necessary in-class support for technology integration relied on each other for instructional support.

Professional Development. On both Dell and Apple campuses, first-year professional development emphasized knowledge of immersion package tools and their classroom use. Both Apple and Dell provided some in-class support for integration, although the characteristics of classroom training differed. Despite differences in the professional development models, the outcomes were similar. Professional development increased teacher comfort with technology and led to some changes in classroom practice. A number of teachers, however, had difficulty retaining content or were indifferent to changed practice. After initial teacher resistance, most principals in spring believed teachers' attitudes improved as they became more familiar with technology immersion. Still, gaining teacher buy-in remained a central challenge of implementing immersion at some campuses.

Resource Utilization. Most teachers reported limited use of TIP package resources in the first year. Some teachers said they lacked the skills and training to use the instructional and learning resources, while others cited a lack of time or frustrations when resources did not work as expected. As a whole, the infusion of an array of resources within a short time span was overwhelming for many teachers.

Implementation Supports for Immersion. Information collected during the first year revealed that campus and district leaders played a critical role in the implementation of technology immersion. Likewise, parent and community buy-in was essential for successful implementation.

District and Campus Leadership. District administrators' roles and levels of involvement with immersion campuses varied widely, and personnel turnover was one factor that affected district leadership. A synthesis of comments about campus leadership indicated that principals demonstrated effective leadership for immersion by scheduling planning time, communicating expectations, modeling technology use, marshalling resources, establishing and enforcing policies, and encouraging teacher efforts.

Parent and Community Support. The level of parent support varied across campuses. And, while most parents viewed students' laptop access as a welcome learning opportunity, some feared financial repercussions or worried about inappropriate use.

Progress toward Classroom Immersion. As part of focus groups, teachers and students described the nature and extent of their technology use during the first year. Nearly all of the teachers reported that they integrated technology into their lessons at least some of the time—however, laptop use varied across schools, classrooms, and subject areas. In English language arts and reading classes, students' laptops most commonly provided a tool for acquiring basic factual knowledge and creating written products. In science classrooms, laptops most often provided a mechanism to conduct topical research on the Internet. Similarly, in social studies classes, laptops most often served as a tool for topical research on the Internet, writing, and note-taking. Math teachers struggled to find ways to integrate technology into their curriculum. As a whole, teachers were challenged in the first year by insufficient guidance for lesson development, minimal in-class modeling and coaching, and a lack of time to meet the increased demands of technology immersion.

Effects of Technology Immersion

Schools. The TIP grants fostered the infusion of new technologies that moved middle-school campuses toward expectations for the 21st century. New resources often were viewed by educators as a mechanism for changing teaching and learning to better meet the needs of today's students who are accustomed to more interactive, digital experiences. Laptops also were believed to provide a means for students to acquire knowledge and skills essential for gaining admission to post-secondary educational opportunities and seeking future employment. Many also saw TIP grants as a way of leveling the playing field for students from low socio-economic backgrounds. With the provision of laptops came a sense of equity as *all* students now had access to the same resources. In the words of a sixth grader, "Now everybody knows how to use the computer." Still, the introduction of laptops challenged educators with a variety of unanticipated discipline issues and spurred the implementation of new policies and consequences for laptop infractions.

Teachers. Teachers across campuses thought technology immersion required an extraordinary commitment of time and effort. Even though learning to use new resources and to integrate laptops into instruction had been difficult for many who began the project with minimal skills, with time teachers gained confidence and increased their proficiency and comfort with technology. Across immersion campuses, teachers said they had changed their approach to classroom instruction, with the most prevalent change involving the use of online resources for student-directed research projects. The presence of laptops also required teachers, sometimes reluctantly, to change classroom management strategies.

Students. Despite some disciplinary issues, technology immersion appeared to have a number of benefits for students. Foremost, administrators, teachers, and students cited positive effects of immersion on students' engagement in school and learning and their technology proficiency. Immersion appeared to provide a particular advantage for special student populations (e.g., English language learners, special education students, and students with habitual discipline problems). According to educators and students, immersion also gave students greater access to information not found in textbooks, new resources and learning tools that reshaped their approaches to class work and improved study habits, and opportunities to demonstrate greater self-responsibility and self-regulation of their learning and behavior. Although many students thought laptops made them better learners and improved their academic performance, most teachers were reluctant to link immersion to student achievement.

Lessons Learned in the First Year

Findings from the first year provide direction for the refinement of the technology immersion model as well as information for other schools planning for technology immersion. Lessons to follow address leadership and planning, technical support, professional development, classroom immersion, and sustainability and expansion.

Leadership and Planning

- Involve district and campus leaders, teachers, and parents in the decision to become a technology immersion campus.
- Build strong leadership for immersion.
- Allow extended time to plan for immersion.
- Establish supportive and dependable relationships with vendor partners.
- Devise a plan for dealing with complex logistical arrangements.
- Ensure laptop and Internet security.
- Establish well defined and understood policies and practices relative to student responsibility and appropriate use, and parent oversight.
- Budget for additional funds beyond grant awards.

Technical Support

- Build a healthy infrastructure for wireless technology prior to immersion.
- Hire campus-based technical support for immersion, and ensure that staff members have dedicated time for their assigned duties.

Professional Development

- Provide a well defined and consistent model for professional development.
- Address both knowledge of immersion resources and classroom integration.
- Provide distributed training with time for classroom implementation.
- Explore ways to address professional development scheduling challenges.
- Provide teachers with time, guidance, and support for change.

Classroom Immersion

- Recognize that teachers in the initial stages of immersion will generally use laptops and digital resources to enhance their existing instructional practices.
- Assess teachers' existing technology knowledge and skills and plan accordingly.
- Consider a gradual approach to the introduction of instructional and assessment resources.

Sustainability and Expansion

- Plan for continuation as part of the decision to become an immersion district or campus.
- Consider how immersion may need to be expanded to other schools and students.