highly concentrated in rural and very small districts across the state. Still, about a third of the districts and schools are in large cities or suburban locations around cities. The sample also includes campus charter schools (one each for the treatment and control group) located in a major urban district.

Three groups or cohorts of students will be followed in the study, with Cohort 1 followed for four years, Cohort 2 for three years, and Cohort 3 for two years. In 2004-05, data collection activities centered on the initial sixth-grade cohort, which included 5,564 students (2,570 at immersed and 2,994 at control campuses). About 1,304 teachers participated in the study (622 at immersed and 682 at control campuses).

Data Collection and Analysis

Data collection involved a mix of qualitative and quantitative data sources. Researchers conducted site visits in each of the middle schools in fall 2004 and spring 2005. For this report, we concentrate on site-visit data gathered through observations in a sample of sixth-grade classrooms (English/language arts, mathematics, social studies, and science). Additional measures, administered as pre- and post-measures in fall and spring, include a Campus Technology Inventory completed by the campus technology coordinator, teacher online surveys, and student paper-and-pencil surveys. Additionally, we gathered school and student demographic, attendance, and achievement data from the Texas Public Information Management System (PEIMS) and Academic Excellence Indicator System (AEIS). In spring 2005, individual middle schools submitted student-level data on disciplinary actions.

We analyzed the effects of immersion on teachers' and students' self-reported perceptions of technology and proficiencies and students' TAKS achievement using two-level hierarchical linear models (HLM). For various analyses contrasting teachers or students in immersed and control schools after one school year of implementation, we used important teacher characteristics (fall survey scale scores, experience, technology certification, gender) and student characteristics (fall survey scale scores, prior achievement, economic and minority characteristics, and gender) as control variables. We also calculated effect sizes in standard deviation units (usually Cohen's *d*). The interpretation is that an effect greater than 0.5 is large, 0.5 to 0.3 is moderate, 0.3-0.1 is small, and less than 0.1 is trivial.

Major Findings

First-year results reveal positive effects of technology immersion on schools (leadership and system support, innovative culture, classroom integration, parent and community support), teachers (proficiency and productivity, technology use and integration, collaboration), and students (technology proficiency and use, small-group work, school satisfaction, and behavior). In most cases, the sizes of effects suggest that the impacts of technology immersion are of both statistical and practical importance. In contrast to positive effects on school, teacher, and student mediating variables, there were no statistically significant effects of immersion in the first year on either reading or mathematics achievement for sixth graders, who are members of a student cohort that will be followed through eighth grade. Overall, positive findings are compelling in light of evidence indicating that the level of implementation in the first year for 20 of the 22 middle schools was partial immersion rather than substantial (2 schools) or full immersion (no schools). Additional details for key findings are provided below.

First-Year Implementation

Researchers used rating scales to identify four levels of immersion: minimal (1), partial (2), substantial (3), and full (4). The overall level of Technology Immersion was a composite score derived from values for four domains: (a) Robust Access to Technology, (b) Technical and Pedagogical Support, (c) Professional Development, and (d) Resource Utilization and related indicators. Scores came from various data sources including vendor records, interviews, focus groups, surveys, and grant documents.

In the first year, almost all middle schools achieved only partial immersion Middle schools struggled in the initial year to accommodate the complex demands of technology immersion within the existing school environment. As might be expected, no campus reached full immersion. The two middle schools that made greater strides toward immersion than others (substantial immersion) had stronger district and campus leadership and invested more time and resources in professional development.

In general, first-year implementation was affected by a number of school and contextual factors. First, time for planning was insufficient due to grant-related logistical procedures. Furthermore, many middle schools, which were housed in older buildings, encountered problems with outdated infrastructures and technical problems with wireless networks and Internet connectivity. Districts and campuses also had to grapple with myriad policies and practices related to laptop access and use. The greatest barriers to implementation, however, involved people. Teachers were at different stages of readiness for immersion and their receptivity varied. Varying abilities and attitudes, coupled with teachers' perceived pressures to improve students' scores on the TAKS, made many teachers reluctant to try new and untested instructional methods and materials in the first year. Additionally, leadership at both the district and campus levels emerged as a critical factor driving or limiting progress.

Moreover, teachers rarely helped students to understand the relevance of their learning or made connections with students' prior experiences. Findings from classroom observations are important because of the established link between more challenging and authentic pedagogy and academic achievement (Newman & Associates, 1996; Newman, Bryk, & Nagoaka, 2001). If abundant access to technology fails to elevate the quality of students' learning experiences, the likelihood of a positive impact on student achievement may be diminished.

A major challenge for teachers in the first year was simultaneously learning how to use technology and finding time to integrate laptops and digital resources into existing practices. Although teachers at immersed schools, as a whole, made substantial progress in the first year, teacher proficiency and laptop use varied greatly by teacher, subject area, and school. Decisions about how and how often laptops were used for teaching and learning depended on each teacher's readiness and preference. Survey results show that more experienced teachers and male teachers in middle schools viewed themselves as less proficient, used technology significantly less often, and expressed lower level of support for technology integration.

Information from classroom observations and fieldwork also suggest that in the initial stages of implementation, most teachers maintained their existing pedagogical practices. Teachers typically had students use laptops to do the same kinds of activities they previously had completed with paper and pencil, such as completing worksheets, typing vocabulary words and definitions, or reviewing for multiple-choice tests. This finding is consistent with research showing that teachers progress through developmental stages while learning to create technology-infused classroom environments. Many teachers at immersed campuses appeared to be at the adoption or adaptation phases, as they were using technology to support traditional instruction or integrating new technology into traditional classroom practice (Apple Computer Inc., 1995).

Effects of Immersion on Students

Students at immersed campuses are more highly engaged in school than control students.

reported using technology most often in reading/English language arts, science, and social studies classes (nearly once or twice a week) and least often in math classes (about once or twice a month).

There was no apparent effect of technology immersion on student self-direction. We theorized that sixth graders’ opportunities for independent and self-guided learning afforded through one-to-one technology would positively affect students’ personal self-direction. Students completed the Style of Learning Inventory as a measure of self-directed learning, including processes such as forethought, performance/volition control, and self-reflection. Findings in spring showed there was no significant difference between the Self-Directed Learning scale scores for sixth graders in immersed and control schools (effect size of 0.06). Nevertheless, changes in students’ perceptions of their self-direction may emerge as they progress to higher grade levels and pe