The Digital Learning Classroom
Improving English Language Learners' Academic Success in 3rd and 5th Grade Math and Reading




Round Rock ISD, Texas

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Technology Driven Instruction

Educators have for many years looked at computer technology as a potential source for meeting the learning needs of English Language Learners.

Throughout the 1960s and 1970s, a behaviorist model for computer-based instruction existed in which language instruction was introduced in the form of drill and practice. During the 1980s and 1990s, the focus shifted to the cognitive and language proficiency needs of ELLs in which content-based teaching became a widely accepted means of teaching English (Butler-Pascoe & Wiburg, 2003).

Today's technology-based instruction emphasizes students constructing meaning based on a high degree of interactivity among students, between students and curriculum, and between students and teacher. An emerging class of technology that offers enormous potential in generating these interactions is interactive whiteboards or IWBs. The purpose of this paper is to examine the potential of IWB technology in Round Rock, Texas to help meet the learning needs of English Language Learners, through the district's Digital Learning Classroom Project.

The Need for Innovation

Round Rock ISD is a growing urban district located in central Texas educating over 38,000 students from early childhood programs through twelfth-grade. About 2,800 or 7.4 percent of these students are English Language Learners (ELL) mostly in grades Kindergarten through grade five. In the past four years the district's ELL population doubled. The **challenge** to address the learning needs of this growing, diverse student population has never been greater.

In Texas, the state's high stakes assessment, the Texas Academic Knowledge and Skills (TAKS), is used by schools to measure student success. Closing the student achievement gap for ELL students and students in low socioeconomic conditions is a great concern ,especially for students in the 3rd and 5th grade levels. This is due to the high stakes nature of TAKS – if students do not pass their state TAKS assessments in these grade levels, they cannot be promoted.

In the 2005-06 school year, the year prior to the Digital Learning Classroom project, the TAKS scores for ELL students in grade levels 3rd and 5th in Round Rock ISD was significantly below that district averages for all students, as shown in the table below.

Round Rock ISD TAKS Performance

School Year 2005-06

3rd Grade Math

All Students	ELL Students
93%	42%

3rd Grade Reading

All Students	ELL Students
96%	72%

5th Grade Math

All Students	ELL Students
92%	39%

5th Grade Reading

All Students	ELL Students
92%	60%

The Digital Learning Classroom Project

An objective of the district was to determine the extent to which technology could help close the achievement gap of both ELL students as well as low income students in Math and Reading . Another objective was to determine how student learning results fared in classrooms using technology compared with those in similar classrooms without the technology. Thus the district embarked on a rigorous study of the effects of interactive whiteboard technology in the classroom.

A review of the research on effective learning technologies and a study identifying five guiding principles of effective instructional practice from the National Research Council (2000) offered guidance to the district in its decision to use Promethean Activclassroom as the centerpiece of the Digital Learning Classroom, after district leaders determined that such technology would allow teachers to:

- Incorporate ELL students' prior knowledge, culture, interests, and experiences in new learning (BECTA, 2003; Burden, 2002; Miller & Glover, 2002).
- Provide opportunities for ELL student-interactions in a more socially supportive classroom setting (BECTA, 2003; Beeland, 2002; Bell, 2002; Burden, 2002; Edwards et al., 2002; Kennewell, 2001; Levy, 2002; Miller & Glover, 2002; Thomas, 2003).
- Integrate ELL strategies in different contexts, thereby supporting learning for students with diverse learning styles and needs (Bell, 2002; Billard, 2002; Burden, 2002).
- Contextualize instruction and use such strategies like graphic organizers that support ELL students' development of higher-order thinking skills (Butler-Pascoe & Wiburg, 2003; Walker-Tileston, 2004).
- Incorporate short-cycle assessments into the lesson plan to provide ELL students with feedback on their progress (Miller & Glover, 2002; Richardson, 2002).

Research Design

In implementing the Digital Learning Classroom, the district asked principals at three school-wide Title I elementary schools to select Bilingual/ESOL teachers to implement the project. One principal selected two teachers each in 3rd and 5th grades; another principal selected two teachers in 5th grade; and the third principal selected one 3rd grade teacher to implement the Digital Learning Classroom. The principals also selected mainstream classrooms without Digital Learning Classroom components, for comparison purposes.

The Digital Learning Classroom's technical components were installed in late October and the selected teachers began their Digital Learning Classroom training with a school-wide curriculum specialist. The school-wide curriculum specialist worked with the teachers in integrating the technology into the math and reading curriculum.

The research design involved gathering Texas TAKS test data for math and reading in spring 2007 for 3rd and 5th grade. The district also provided demographic information that identified students as "ELL" or "Not ELL" and "mainstream low socio-economic with technology" vs. "mainstream low socio-economic without technology". The study also associated students and their data with the teacher who was serving them.

This allowed for quantitative analysis of the data to determine the extent to which the Digital Learning Classroom's technology could help close the achievement gap of ELL and mainstream low income students in mathematics and reading .

Results

The Round Rock Digital Learning Classroom project demonstrated that increasing student achievement is possible through Promethean Activboard Technology.

3rd Grade TAKS Math Performance

The goal of significantly increasing ELL academic achievement with the Digital Learning Classroom's technology was realized by the district. The ELL Digital Learning Classrooms TAKS pass rate was 84.5% as compared to 60.0% pass rate of the control group of ELL students in classrooms without the technology.

The performance of mainstream low-income students in Digital Learning Classrooms were comparable students in classrooms without the technology. The TAKS pass rate of students in classrooms without the technology was 95.1% as compared to the 90.9% pass-rate for students in classrooms with the technology, but more of the students in classrooms with the technology reached the highest assessment level on the TAKS ("TAKS Commended).

3rd Grade TAKS Reading Performance

The impact of the Digital Learning Classroom technology on ELL academic achievement was subtle . The ELL Digital Learning Classroom students' TAKS pass rate was 77.8% as compared to 84.6.0% pass rate of the control group of ELL students in classrooms not using the technology. However, the percentage of ELL Digital Learning Classroom students who achieved at the TAKS Commended level was 10% higher than that of those in the control group of ELL non-Digital Learning classrooms.

The average assessment results of mainstream low-income students in the experimental and control groups were within ±5% of each other. The mainstream non-Digital Learning Classrooms achieved a TAKS pass rate of 95.1% compared to 90.9.% for those in the Digital Learning Classroom classes. However, again, the percentage of students achieving "TAKS Commended" score levels was 10% higher for those in the Digital Learning Classrooms than those in the control group of comparable classrooms without the technology.

5th Grade TAKS Math Performance

The goal of increasing ELL academic achievement with the ELL Digital Learning Classrooms was achieved by the district. The ELL Digital Learning Classrooms TAKS pass rate was 88.9% as compared to 66.0% pass rate of the control group ELL non-Digital Learning classrooms.

Furthermore, the percentage of ELL students achieving the TAKS Commended rating was 50.0% for those in the Digital Learning Classrooms compared to 8.5% for those in the control group without access to the technology.

The TAKS results of mainstream low-income students in the control and experimental group classrooms were similar, within ±5% of each other. 84.6% of the mainstream students not in the Digital Learning Classrooms passed the TAKS assessment compared to 87.2% of comparable students in classrooms using the technology. However, the percentage of students achieving at the TAKS Commended level was 35.9% for those in Digital Learning Classrooms compared to 28.2% for those in classrooms not using this technology.

5th Grade TAKS Reading Performance

5th grade is normally a year when some districts see a decline in ELL student scores. The goal of increasing ELL academic achievement with the ELL Digital Learning Classrooms was achieved by the district.

The TAKS pass rate for ELL students in Digital Learning Classrooms was 100% compared to a 73.2% pass rate for ELL students in the control group of classrooms not using the technology.

The TAKS pass rate of mainstream students in non-Digital Learning Classrooms was 83.6% while that for mainstream students in Digital Learning Classrooms was 66.7% . 20% of mainstream students in both Digital Learning Classrooms and in classrooms not using the technology achieved a TAKS Commended rating.

Summary

Based on these findings the district found that significantly increasing student achievement among ELL students is distinctly possible using Promethean Activboard technology. Based on the significant learning gains seen in initial use of the technology, even greater results can be expected for ELL students in the second year of implementation and beyond as teachers deepen their skills in using the technology instructionally, identifying and delivering the Digital Learning Classroom's digital curricular resources, and engaging ELL students in meaningful learning. The gains in ELL student achievement also should be especially greater for those 3rd and 5th grade ELL students found to be academically ready for promotion based on their first-time TAKS test results.

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