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BILINGUAL STUDENTS

Differences in Academic Achievement in Mathematics Among
Hispanic Students Enrolled in Fourth Grade Regular, ESL,
and Bilingual Classes

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Many educators, as well as parents, question the effectiveness of bilingual education in our schools. Research reports many issues dealing with bilingual education such as parent attitudes toward bilingual education, dual-language, code switching, school funding policies, and others. Results from a parent survey about the attitudes toward a Chinese-English bilingual education program suggest that both English-dominant and Chinese-dominant parents are supportive of developing bilingualism in their children (Lao, 2004). Another important and difficult issue is measuring a bilingual program's success (Abbate, Brisk, Minaya-Rowe, & Torres-Guzman, 2002).

Regular programs use English to teach the state curriculum. The main source of modifications available to students enrolled in regular education programs would be special education modifications. However, the English as a Second Language (ESL) program are for students whose first language is not English. The intention of an ESL program is to serve these students in an environment that is away

from the regular programs to facilitate English learning. Bilingual programs use the first language of a student for instruction to help the student in English learning. In the case, with Hispanic students, Spanish is usually the first language.

Bilingual programs differ in their structure. Dual-language, bilingual, and transitional programs are the main three that are used. In the district that was researched for this study, the transitional bilingual program was the most used. Transitional bilingual programs offer Spanish instruction to the students until about the second grade while also learning teaching English. If a student shows significant mastery in English and Spanish, the student is placed in an ESL or a regular program under the recommendation of the language proficiency assessment committee (LPAC).

One of the exit criteria for an ESL or bilingual program is mastery test scores on achievement tests and language proficiency tests. Starting in the third grade, students are required to take a state mandated test called the Texas Assessment of Knowledge and Skills.

Parents have many choices when it comes to accepting or declining a particular curriculum program in schools today. One main issue with bilingual education is the

parents' understanding of the function of the program. A minuscule number of parents are familiar with the practices and policies in place at their children's school and their expectations for English-language instruction vary widely from what is actually happening in the classroom (Sheffer, 2003).

Another issue in a child's education is parental involvement. Parental involvement is a key predictor of a student's academic success (Barge, 2003). A great show of parental support and involvement is evident in a study in Colorado. Sheila M. Shannon and Madeline Milian conducted a survey of parents whose children were enrolled in dual language programs in Colorado (Milian, 2002). The results of the survey indicated parents were supportive of the dual language program.

Research shows that language is an important part of human interaction (Reyes, 2004). In this study, the researcher wanted to see if there is a significant difference in academic achievement among bilingual students and monolingual students. Another study by Potowski (2004) indicated that students use L1 to communicate more often with their peers. Students are more likely to communicate with peers and teachers in their first language, L1.

Statement of the Problem

The problem investigated in this study is ensuring Hispanic students are successful and that existing gaps among learners is eliminated in Texas. According to Holloway (2004), there is still a large gap in academic achievement in mathematics and other content areas.

Statement of the Purpose

The purpose of this study was to investigate academic achievement in mathematics among regular, English as a Second Language (ESL), and bilingual students using a comparison of fourth grade math Texas Assessment of Knowledge and Skills (TAKS) scores among Hispanic students. Are there any significant differences between regular, ESL, and bilingual Hispanic students math test scores?

Significance of the Study

The significance of the study was examining the differences in academic achievement in mathematics among Hispanic students enrolled in regular, ESL, and bilingual programs. The researcher wanted to know if students in the three programs needed significant help or tutoring to close any gap that may be present in these three programs.

Research Questions

The following research question guided this study:

1. Is there a significant difference in TAKS scores in the area of mathematics among regular, ESL, and bilingual students in fourth grade?

Method

Participants

Participants for this study were Hispanic students enrolled in bilingual, ESL, and regular programs in fourth grade classes. These students were selected from a large school district in Harris County Texas.

Thirty Hispanic students from each program, bilingual, ESL, and regular were randomly selected. Ninety participants in the fourth grade were included in this study.

Participants and Context

According to the 2002-2003 Academic Excellence Indicator System report (Texas Education Agency, 2003) and the district Triand report (Triand, 2003), the school district studied had 4,224 students enrolled in fourth grade, 2,460 Hispanic students, 651 Hispanic students enrolled in bilingual programs, 440 Hispanic students enrolled in ESL programs, and 1,369 Hispanic students enrolled in regular programs. In the state of Texas, 321,440 students were enrolled in fourth grade.

Instrument

Scores from the mathematics portion of the fourth grade Texas Assessment of Knowledge and Skills (TAKS) 2003 test were used to compare the academic achievement of among Hispanic students enrolled in bilingual, ESL, and regular programs. The TAKS test is a criterion-referenced test given in Texas to measure student academic achievement in various content areas and objectives. The TAKS test is given to students from the third grades all the way up to exit levels in high school.

The Texas Education Agency has set up some testing standards for all of the grade levels. According to the Texas Education Agency's website, the passing standard for the fourth grade math TAKS test was set at the scale score of 2100 and commended performance was set at 2400 for the 2003-2003 school year.

Design

Student groups in the fourth grades, bilingual, ESL, and regular programs had their test scale scores compared and analyzed. These groups of students' TAKS scale scores were used to research causal-comparative differences in academic achievement by applying analysis of variance test (ANOVA test).

Procedure

These student groups have taken the state mandated TAKS test in math in late April 2003. These scores will be used to determine academic achievement between these groups.

The students in the bilingual, ESL, and regular programs are taught mathematics in English. All three groups have been given the same amount of instruction. The academic objectives of the TAKS test are identical in these programs.

Data were collected from the TRIAND database. This database can be accessed through the district website of the campus being studied. This database provides results from every major assessment given at this district. This data can be used to make educational decisions based on current, comprehensive data (www.triand.com). In this research, the data were used to apply causal-comparative research on academic achievement among third and fourth grade students in regular, ESL, and bilingual programs.

Results

In the study, one large urban school in Harris County, Texas was selected. The study was conducted to determine if there were any significant differences in math TAKS scores among fourth grade Hispanic students enrolled in bilingual, ESL, or regular programs. Texas Assessment of

Knowledge and Skills scale scores were obtained from the district being studied through the website database TRIAND. Additional information about demographics was obtained through the Texas Education Agency's Academic Excellence Indicator System reports.

Table I will shows the mean scale scores and the standard deviations for the bilingual, ESL, and regular programs for the 2002-2003 math TAKS test. There was a significant difference in academic achievement between Hispanic students enrolled in ESL and regular programs, but not between Hispanic students in bilingual programs and the other two, ($p > 0.05$). Table I also shows these ANOVA results.

Table I

TAKS Scale Scores Among Hispanic Bilingual, ESL, and Regular Students

Students	Mean	n	SD	Std. Error	df	F	Sig.	
Bilingual	2169.30	30	170.676	31.161	Between Groups	2	4.920	.009
ESL	2141.77	30	137.055	25.023	Within Groups	87		
Regular	2258.03	30	140.071	25.573	Total	89		

The Post Hoc Tests reveals the same conclusion; there is a significant academic achievement difference between Hispanic students enrolled in ESL and regular programs. Hispanic students enrolled in ESL programs scored

significantly lower than Hispanic students enrolled in regular programs. Hispanic students enrolled in bilingual programs showed no significant difference among bilingual, ESL, and regular programs. Table II indicates $p < 0.05$, so ESL and regular scores are significantly different. Table III demonstrates these comparisons.

Table II

Post Hoc Test/Tukey HSD

(I) Program	(J) Program	Mean Difference (I-J)	Sig.
Bilingual	ESL	27.53	.758
ESL	Regular	-116.27*	.010
Regular	Bilingual	88.73	.062

*The mean difference is significant at the .05 level.

Conclusion

There was a significant difference between Hispanic students enrolled in ESL and regular programs in academic achievement on the math TAKS test as indicated by Table II, $p > 0.05$. Hispanic students enrolled in bilingual programs appeared to have no significant differences in comparison to Hispanic students enrolled in ESL and regular programs. The reasons for these differences might have to do with the level of instructional help available to the students. ESL students are still trying to make the transition from a bilingual program to a regular program. There still might be some gaps in the vocabulary and knowledge of these

students. Hispanic students enrolled in bilingual programs still have the luxury of having a teacher that can help them in their native language.

Recommendations

In the future, this study should use a larger population from a different school district. The results of this study and other studies need to be compared before conclusions can be made for the general population.

It is recommended that bilingual programs continue because of the close results these students have compared to Hispanic students enrolled in regular programs.

It is also recommended that Hispanic students enrolled in ESL programs should be closely monitored until they are exited from the program and mainstreamed.

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