

Texas Dual Language Program Cost Analysis



A Report
developed for the

Texas Education Agency
and
The Texas Senate Education Committee

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Bilingual Education Programs

To view the Texas Directory of Dual Language Programs

See

<http://texastwoway.org>

(This is the only state DL directory in the U.S.)

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Executive Summary

U. S. public school systems have felt increasing pressure to “produce” a workforce with high levels of literacy while at the same time encountering large numbers of immigrant families whose native language is not English and who often have had limited educational opportunities. Providing a quality education for ELLs (English language learners) has become critical as nearly 4.5 million children come to school from families where the home language is other than English (U. S. Census, 2000). In fact, in 2002, ELLs comprised 9.64% of the national enrollment in public elementary and secondary schools and 79% of those ELLs are Spanish speakers (National Center for Education Statistics, 2002). More specifically, Texas had an 84% growth in the ELL population during the twelve year period from 1989 to 2001; this percentage growth continues to rise with a current estimation of 630,000 ELLs (14% of the total public school population) for the 2003-2004 school year. The educational implications of the growing population are huge. The U.S. Census Bureau (Therrien & Ramirez, 2000, March) reported that Hispanics graduate from high school at a rate of 57% compared to non-Hispanic Whites at a rate of 88.4%. Additionally, 27.3% of Hispanics have less than a ninth grade education compared to only 4.2 percent for non-Hispanic Whites. Two of the most cited reasons for these achievement differences are language difference and socio-economic status (SES). The large influx of Hispanic students in U.S. and Texas schools and the expected population trends have made critical the need to improve academic achievement for Hispanic youth.



Due to purported academic effectiveness and cultural and linguistic inclusivity, dual language (DL) programs have seen a rapid increase in Texas and the nation. An extensive review of literature indicated that no national or state-wide studies have addressed the issue of cost analysis of dual language programs. Information on funding of effective educational programs for ELLs is vital for all stakeholders, including policy makers and current and future DL program administrators.

In fall 2004, Texas A&M University and Sam Houston State University were requested by Senator Florence Shapiro (Chair, Texas Senate Committee on Education) and the Texas Education Agency to conduct a cost analysis study of dual language programs in Texas. As a result, an online survey was developed, piloted and distributed to all known DL programs and to all Texas school districts. The survey, which requested information on DL costs, consisted of 40 to 91 items. From a total of 166 known DL programs in Texas, 83 DL campus surveys were included in the analysis, representing 48 school districts. This represents a 50% response rate. For the purpose of the study a small DL program was comprised of 10-120 students; medium DL program = 121-240 students; and large programs = 240+ students.

The overarching question for our analyses was *how much does a DL program cost per pupil?* The results showed that beyond the state Title III allotment, DL programs' annual costs on average \$290 per pupil in large programs; \$406 per pupil in medium programs; and \$879 per pupil in small programs. Notably, there was no significant difference found between the two most common program models, 50:50 or 90:10. Additionally, a two-teacher, mixed model was found to be the least expensive model. The



largest categorical costs for all three DL program sizes were associated with managerial costs. These costs were significantly diminished as program size increased.

The full report details percentages of total budgetary costs in 12 categories: managerial, staff, instruction, staff development, Spanish curriculum, English curriculum, assessment, equipment, recruitment, public relations, parental involvement and other materials. Further analyses were reported by start-up costs, annual costs and additional funding requests.

Data indicated smaller DL programs are more costly to implement and maintain. As program size increases, per pupil costs were reduced. There was a significant positive relationship between federal funding and program size. Twenty-two of the 25 reporting large DL programs (88%) received federal funds. The two-teacher mixed model was the most cost effective and the most frequently reported teacher model. Approximately half of the students in the DL programs (the native English speakers) were not supported by any state or federal ELL entitlements. Instructional materials, assessment instruments and parental involvement programs for this population of DL students and their parents significantly impacted program costs and feasibility. The data revealed a common concern across programs related to costs associated with native English speakers and the discontinuation of federal Title III grants that funded start-up and five years of implementation for a significant number (n=53 or 64%) of reporting DL programs.

This report does not address the relationship between costs and program effectiveness. We must caution that the most cost effective DL program may not be the most educationally effective DL program. Successful schools' research points to several



components such as: increased staff development, parental involvement programs, extended hours, strong educational leadership, quality curriculum and early and sustained interventions as elements of strong, research-based programs. All of these components may incur costs above any basic program implementation.

Dual language programs provide opportunities for language minority and language majority students to reach high levels of bilingualism and biliteracy needed to prepare them for the 21st century workplace. We concur with Senate Resolution No. 50 that recognizes the worth of dual language education.

“Resolved that the State of Texas work towards the worthy goal of ensuring that someday every Texan will master English plus another language”

Texas Senate Resolution No. 50, 2001.



Texas Dual Language Program Cost Analysis

The English Language Learner (ELL) population in Texas has experienced an 84% growth since 1989 (National Clearinghouse for English Language Acquisition, 2002) and was at 630,000 in 2003 (Texas Education Agency, 2003). This dramatic increase places Texas second only to California in the number of school-age ELLs (National Clearinghouse for English Language Acquisition, 2003). This rapid demographic change has focused attention on effective educational programs for ELLs. Dual language (sometimes referred to as two-way immersion) bilingual programs have seen an increase nationally and a significant increase in Texas due to research that shows positive academic, linguistic, and affective results for ELLs and their English-speaking peers. However, there is a paucity of information available about the costs associated with implementation and maintenance of dual language programs. Conducted in Fall 2004 by Texas A&M University and Sam Houston University, this report is the first detailed cost analysis of Texas dual language bilingual programs. This is the only known report of its kind nationally for dual language programs.

Literature Review

Texas mandates that every student who has a home language other than English and is identified as Limited English Proficient (LEP) be provided an opportunity to participate in bilingual or English as a second language programs (TEC Chapter 29, subchapter B). Four bilingual education program models are offered at the elementary



level in Texas: (a) English as a second language, (b) English immersion, (c) transitional bilingual, and (d) two-way/ dual language bilingual education as indicated in Table 1.

Table 1
Program Models Serving ELLs in Texas

Program	Goals	Students	Teacher Certifications	Role of L1/L2	Length of Program
ESL	English language and academics	ELLs	ESL Generalist	L2 used as language of instruction	1-2 years emphasis on early exit
Sheltered English Immersion	English language and academics	ELLs	ESL Generalist	L2 used as language of instruction	1-2 years emphasis on early exit
Transitional Bilingual	English language and academics; ELLs native language phased out	ELLs	Bilingual Generalist	L1 & L2 used as language of instruction	2-4 years; usually early exit; few late exit
Dual Language	Bilingualism Biliteracy Biculturalism High Academic Achievement in L1 and L2	ELLs and Native English speakers	Bilingual Generalist and ESL Generalist MS & HS Foreign language certified w/ native fluency; Content-area certification with high foreign language fluency	L1 & L2 used as language of instruction	Typically K-7 with goal of HS language maintenance

Texas law mandates that all school districts with at least 20 ELL students¹ in the same grade level must offer Bilingual Education (BE), English as a Second Language (ESL) or an alternative language program (Texas Education Code Chapter 29, Subchapter B).

English as a Second Language

According to Lara-Alecio, Galloway, Irby, Rodriguez, and Gomez (2004), English as a second language (ESL) programs are considered “pull out” models in which ELL students may be “pulled out” from classes in order to receive some sort of English

¹ The Texas Education Code (2002) lists ELL students as limited English proficient.



as a second language instruction. Students often lose valuable access to the full curriculum and have no access to native language support in the content areas. The main focus is on reading, grammar, vocabulary and spoken and written communication in English. The ESL model has been perceived as a deficit model or remedial approach to instruction in which students must overcome their native language “problems.” Although this is the case, ESL is the model most often implemented; yet, it is the least effective model (Thomas & Collier, 1997). In 2000, Alanís indicated that 38% of eligible Texas students are served in ESL. ESL programs are the most expensive to operate since ESL teachers must be hired to attend to pull-out students. More programs are having regular classroom teachers certified in ESL education so that a “pull-out” ESL teacher is not required; rather, the child receives ESL education in the mainstream classroom.

English Immersion

Often called structured English immersion (SEI) for minority students, this model is less successful for ELLs’ long-term academic achievement than those with native language support (Ramirez, et al., 1991; Thomas & Collier, 1996). Students with different native languages (or low-incidence language groups) where first language instruction is not feasible often make up English immersion classes. Content for all subjects and all instruction in a self-contained classroom is taught in English in an SEI program model; in a departmentalized situation, SEI occurs in each course and by the various teachers (Ovando, Collier, & Combs, 2002). As a result of having to learn the second language along with the content, ELLs may fall behind academically. Subtractive bilingualism is the typical outcome of SEI as the native language is not supported (Baker,



1996). The SEI model is also perceived as a deficit language model (Mora, 2001) in that students are viewed as having to overcome English language deficiencies.

Transitional Bilingual

This program model serves language minority students who are not yet proficient in English and is generally considered a segregated model. Instruction is in the native language for the content areas. In such programs, the native language acts as a temporary bridge to the acquisition of the second language (Baca & Cervantes, 1989; Birman & Ginsburg, 1983; Bruce, Lara-Alecio, Parker, Hasbrouck, Weaver, & Irby, 1997).

Instruction is also delivered in English as a second language. Gradually students are transitioned to all-English classes and are exited out of bilingual programs at the end of three years and in some cases in one or two years (early-exit transitional). Within this program type the focus is on learning English thus the need to “transition” to an English classroom (Brisk, 1998). Early exit transition programs represent a deficit model in that student are exited before they have fully developed cognitive academic language proficiency (Collier, 1992). Students in early exit transitional programs have been more academically successful than those in ESL pull out models but not as academically successful as those in late-exit transitional, immersion or two-way programs (Ramirez, Yuan & Ramey, 1991; Thomas & Collier, 1997; Thomas & Collier, 2002.) Four years ago, Alanís (2000) indicated that 49% of the eligible Texas students were served in transitional bilingual programs.



Dual Language Education

Dual language (DL) programs strive to develop bilingualism and biliteracy skills in all students, language minority and language majority alike (Christian & Whichter, 1995; Valdes, 1997) and foster language equity (Torres-Guzman, 2002). DL programs are also sometimes referred to as two-way developmental or dual language immersion and are considered an inclusive bilingual model. DL programs include the following components: (a) instruction is through two languages; (b) only one language is used during periods of instruction; (c) both ELLs and native English speakers are participants and both groups are integrated for most content instruction (Lindholm, 1987).

Theoretical Foundations of Dual Language Programs. Within DL program designs there are critical linguistic, sociocultural, and pedagogical principles based on important theoretical foundations. The major theoretical principles are: (a) cognitive academic language learning requires five to seven years (Collier, 1992; Cummins 1991); (b) students can transfer knowledge and skills from one language to another (Cummins, 1981b, 1991); (c) and continued development in two languages enhances learners' educational and cognitive development (Collier, 1992; Cummins, 1992). Christian (1994) stressed that the goal of DL programs is to balance the development of language, academic, and social development and not to choose or sacrifice one over the other. According to Thomas and Collier (1997) there are six critical factors of successful DL programs: (a) students participate for at least six years; (b) there is a balanced ratio of speakers of each language; (c) separation of languages; (d) emphasis is on the minority language in the early grades; (e) core academics are emphasized as well as instructional



excellence; and (f) a parents have a positive relationship with the program. Lindholm-Leary (2001) added three others to the list of critical success factors for dual language programs: (a) effective leadership and support by administrators and instructors; (b) a positive school environment composed of an additive bilingual environment; and (c) high quality instructional personnel and staff training.

DL Research Support. Research studies of DL bilingual education indicate that academic achievement is very high for both groups of students participating in the program as compared to students receiving English instruction only (Cummins & Swain, 1986; Lindholm & Aclan, 1991; Thomas & Collier, 1996, 2001). DL programs allow native English speakers to develop advanced second language proficiency without sacrificing L1 development of academic proficiency (Genesee, 1987; Swain & Lapkin, 1982). In their recent national study, Thomas and Collier (2001) found that: Enrichment 90-10 and 50-50 one-way and two-way developmental bilingual education (DBE) programs (or dual language, bilingual immersion) are the only programs we have found to date that assist students to fully reach the 50th percentile in both L1 and L2 in all subjects and to maintain that level of high achievement, or reach even higher levels through the end of schooling. The fewest dropouts come from these programs.

<http://www.crede.ucsc.edu/research/llaa/1.1es.html>

Optimal DL bilingual programs show promising results for both ELLs and native English speakers in terms of both Spanish and English linguistic and academic development, positive intergroup relationships and parental-school partnerships.



Dual Language Program Types. DL programs vary in the amount of instructional time spent in the L1 and L2 and the length of the programs. The most common models are known as 50:50 or 90:10 models (Christian, 1996).

90:10. In 90:10 models, for about 90% of the instructional day, Spanish (or the minority language) is the medium of instruction and English is gradually increased until it reaches roughly 50% in the upper grades in elementary school (fifth or sixth grade). (See Figure 1-a.)

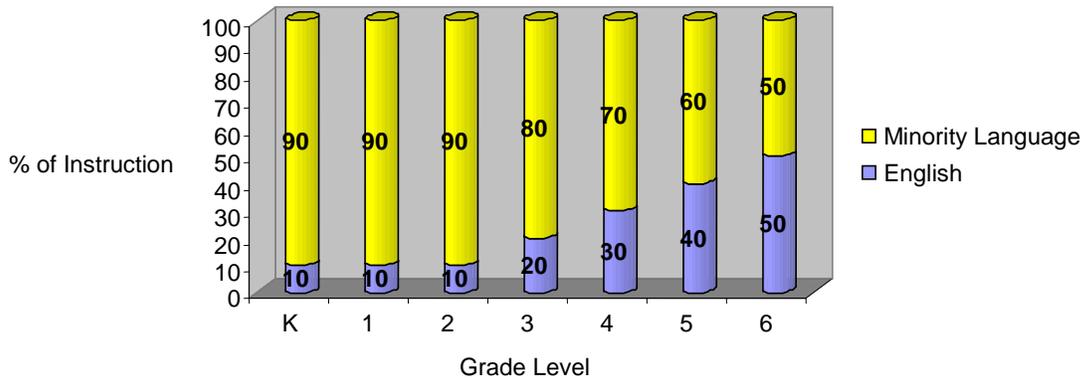


Figure 1-a. Language of Instruction in a 90:10 DL Model

This 90:10 model has its earliest known implementation in San Diego, California in 1975. English speakers and Spanish speakers began their schooling in Spanish for most of the day, from kindergarten through third grade and by fifth grade; English and Spanish were each used approximately 50% of the time. In the 90:10 model beginning literacy instruction is most often taught in the target language, or Spanish, since almost all instruction is in Spanish.



50:50. In 50:50 models the instructional day is equally divided between English and Spanish from Kindergarten. (See Figure 1-b.) In 50:50 models language arts or literacy instruction varies from L1 literacy to L2 literacy or simultaneous teaching of both literacies.

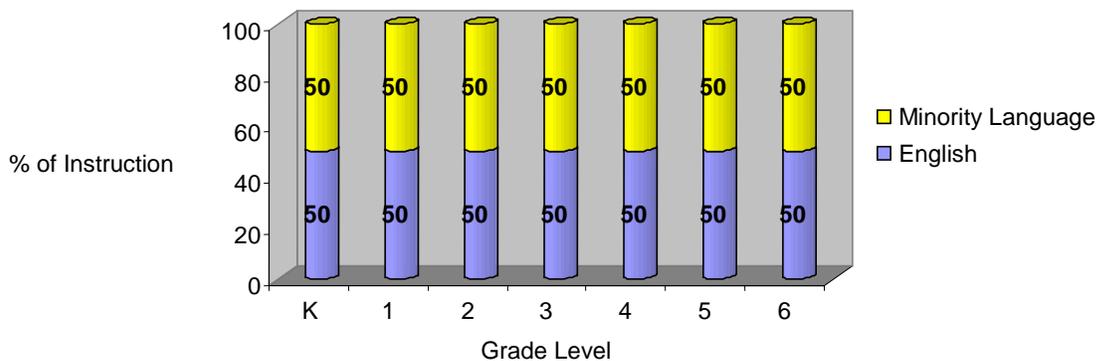


Figure 1-b. Language of Instruction in a 50:50 DL Model.

Coral Way Elementary School, Florida, is one well known example of DL implemented in the 1960s (Torres-Guzmán, 2002). The original design of Coral Way was to accommodate the increasing number of Cuban children whose parents wanted to maintain their children’s Spanish academic language. Coral Way DL students scored equal to or higher than district, state and national averages on standardized tests. In a report by National Clearinghouse for Language Acquisition (NCELA), Pellerano, Fradd and Rovira (1998) evaluated it as a “model for bilingual education nationally and internationally.” Another early 50:50 program, was the Oyster Elementary School DL program in Washington, D. C. in which began in 1971. One unique aspect of the Oyster program was that students were taught both English and Spanish literacy simultaneously.



Slavin and Cheung's (2003) and Galloway's (2003) research support simultaneous teaching of literacy.

Other Program Characteristics. DL programs also vary in the length of the program design (some continue to 12th grade or “late-exit” while others phase out in elementary “early exit”). Further, programs vary in the percentages of “majority” and “minority” speakers and languages of instruction; however, nearly all of the DL programs in Texas are Spanish/English. Within DL programs, the English speakers experience an emphasis on the minority language (Spanish) first and the Spanish speakers experience a maintenance model in which their native language literacy is developed. According to Alanís (2000), the majority of Texas students are served in transitional bilingual programs (49%) or ESL programs (38%). Transitional bilingual and ESL programs are often viewed as “subtractive” and/or “deficit” models of teaching ELLs (Hernandez-Chavez, 1984; Lambert, 1987; Ovando, Collier, & Combs, 2002). In such models, students experience “subtractive” native language and “subjugate” their native language to the majority language. Student proficiency in English and rapid mainstreaming into grade-level classes are the goals of transitional programs; therefore, these programs may be viewed, as “remediation” models where students are viewed as lacking English skills and therefore are in need of quick remediation in English. Conversely, DL bilingual programs are often described as “language additive or language maintenance” programs in which students acquire a second language (L2) while maintaining their first language



(L1) (Cloud, et al, 2000). Table 2 summarizes research outcome trends for the 90:10 and 50:50 DL models.

Table 2

Students' Outcome in DL Programs and Comparison between 90:10 and 50:50 Models

Areas Evaluated	Results	Comparison between 90:10 and 50:50
Language Proficiency L1 proficiency L2 proficiency	Both DL models promoted language proficiency in students' L1 and L2;	Students in 90:10 developed higher <i>bilingual</i> and <i>Spanish</i> proficiency than students in 50:50.
Reading and Academic Achievement L1 L2	Students make significant progress in reading; English speakers who received reading instruction in English by grade three reached at least grade appropriate level. 50 th percentile in both L1 and L2 in all subjects	No differences found.
Drop Out Rate	Lowest rate of all Bilingual or ESL models for ELLs	No differences found.
Content Area achievement mathematics (science and social studies) achievement in L1 mathematics (science and social studies) achievement in L2	Both groups of students performed on par with their peers in California state norm-referenced standardized tests in mathematics; close to grade-level in social studies (90:10); average or above average in science and social studies.	No differences found.

Number and Types of DL Programs in U.S. and Texas

According to the Center for Applied Linguistics' *Directory of Two-Way Immersion Programs in the United States* there were 248 two-way programs in 23 states and the District of Columbia in 2000. This directory also reported an expansion within existing programs adding new grade levels each year, and 40 programs extended into the middle or secondary grades. The 2000 CAL Directory indicated that the majority of the programs are Spanish/English programs (234 out of the 248). Additionally, data collected uncovered tremendous variability in program implementation (Christian, 1994).



Texas. The Texas Education Agency (TEA) collects basic school descriptive data about Texas districts and ELL programs through a software program called PEIMS (Public Education Information Management System). According to the TEA, “in compliance with the Texas Education Code, the Public Education Information Management System (PEIMS) contains only the data necessary for the legislature and the TEA to perform their legally authorized functions in overseeing public education. It does not contain any information relating to instructional method, except as required by federal law” (Online at <http://www.tea.state.tx.us/peims/about.html>). Therefore, the State does not collect specific information about bilingual program type. However, nationally, the Center for Applied Linguistics (CAL) has been collecting data and monitoring the growth of two-way programs in the U.S. since 1991. In 2000, CAL’s *Directory of Two-Way Immersion Programs in the United States* (<http://www.cal.org/twi/directory>) identified 39 two-way schools in 17 districts in Texas. At that time, the members of the Texas Two-way Consortium Steering Committee (TTC), a group of interested academics and practitioners whose mission was to work toward building a consortium to maintain and research bilingual education in Texas, were aware of other DL programs in Texas; therefore the Committee commissioned an expansive statewide study which was supported by the Texas A&M University Bilingual Education Program. The TTC was able to identify 63 DL programs in 32 school districts in Texas 2001. In 2002-2003, 166 DL programs were identified in Texas and 53% of these DL programs were 50:50 models and 47% were 90:10 models. According to CAL, nationally the most frequently reported



type of DL is also the 50:50 model (Lara-Alecio, Galloway, Irby, Rodriguez, & Gomez, 2004).

DL Programs by Grade Level and Classes. According to Lara-Alecio, et al. (2004), the majority of DL programs in Texas are situated at the early elementary levels (see Figure 2). They further noted that nationally, DL programs are frequently implemented at grades PK-3; CAL’s 2000 directory showed 39% of DL programs are situated at the early elementary grades and 40% continue to the upper elementary grades. The Texas data from the Lara-Alecio, et al. (2004) report indicated that 58% of the classes are in grades PK-2 which is higher than national percentage; however, this percentage also implies that many of the Texas programs are new programs that are adding grades each year so the intention is to have later exit programs.

Number of Classes per Grade Level

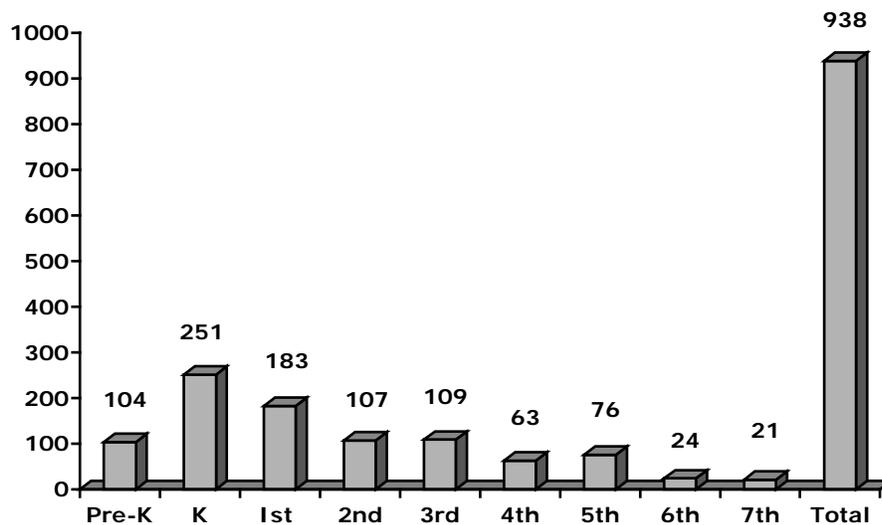


Figure 2. Texas Grade Levels and Classes



DL Programs by Language of Instruction. In the 2004 Lara-Alecio, et al. report, all DL programs in Texas reported that their DL programs used Spanish and English as the languages of instruction. Two programs reported using a third language as a foreign language for enrichment (French or American Sign Language). According to the CAL national data, Spanish and English are the predominant languages of instruction in TWI programs in the U. S. (Center for Applied Linguistics, 2002).

DL Language Distribution of Native Spanish and Native English Speakers. Further reporting on dual language program, Lara-Alecio et al. (2004) found that 47% of the DL programs reported a language distribution of 75% native Spanish (NS) speakers to 25% native English (NE) speakers. The optimal instructional environment in DL programs is an equal division of native English and Spanish speakers. Nearly half of the programs reported being near balanced between native Spanish and English speakers (27% were 50/50 and 20% were 60/40). Only 6% of the programs were weighted in favor of native English speakers. Figure 3 depicts the DL programs by language distribution.



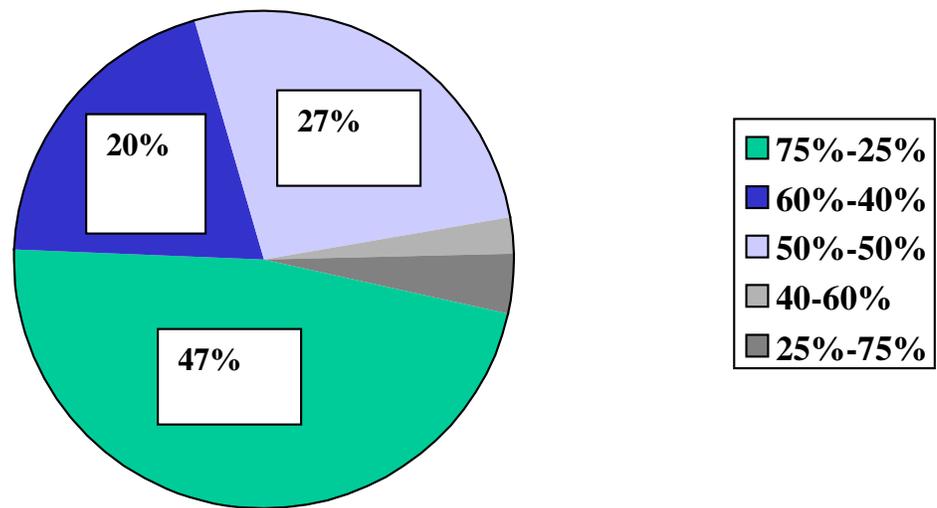


Figure 3. Distribution of Native Spanish (NS) Speakers to Native English (NE) Speakers.

Dual Language Programs by Regional Education Service Center. The state of Texas is divided into 20 Regional Education Service Centers (ESCs) that function as assistance centers for the Texas Education Agency. Figure 4 depicts a map of Texas with the number and percent of the dual language programs in Texas by ESC in a 2004 report by Lara-Alecio, et al. (2004). Data indicated that DL programs appeared in 14 of the 20 ESCs. Region One reported the most DL programs with 26.5% of the programs. Region One is situated in the Texas Lower Rio Grande Valley and has a large percentage of Spanish speaking students.



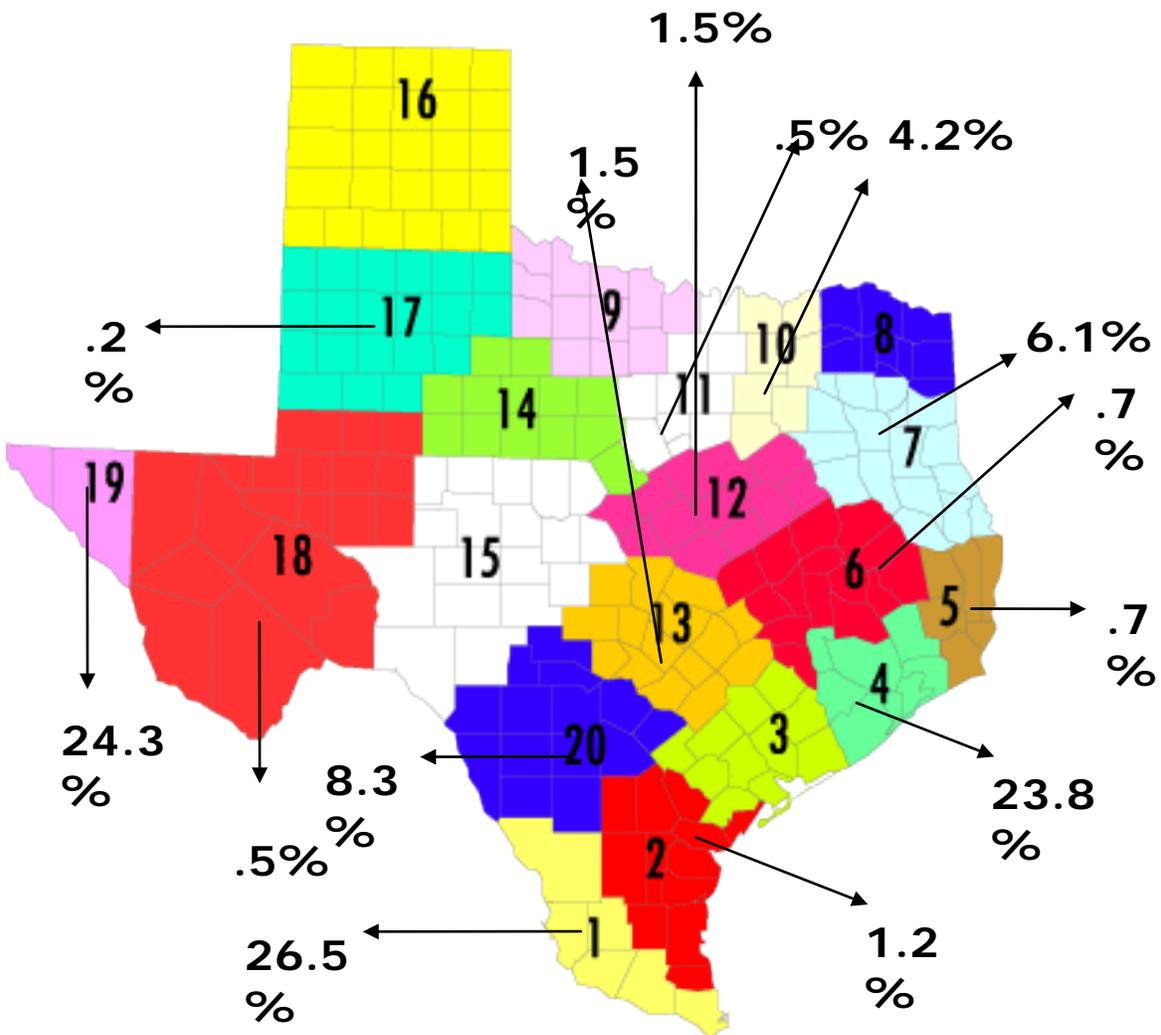


Figure 4. Percentage of DL Programs by Regional Texas Education Service Centers

Notably, two other areas, Region 4 (Houston area) and Region 19 (El Paso area) also had a large percentage of the total DL programs with 23.8% and 24.3% respectively. These three region areas contain 74.6% of the total reported DL programs in Texas. It should be noted that these regions also have high percentages of Hispanic and ELL student populations and are situated in South Texas or border with Mexico.



DL Programs by Years of Implementation. According to the Lara-Alecio, et al. (2004) report, 54% of the programs reported being within the planning year to three years of implementation. Forty-six percent reported being within four to six years of implementation. This indicates that over half of the DL programs in Texas are relatively new programs. Seventy-nine percent of the DL programs that were in the planning year in 2001-2002 reported forecasting a 50-50 model and 30.6% reported planning to implement a 90-10 model. Thirty-eight percent of DL programs in Year 1 of implementation reported having 90-10 models, and 61.8% reported implementing a 50-50 model.

The Focus of the Study: Dual Language Costs

Both the Center for Applied Linguistics' 2000 national study and Texas Two-Way Consortium's 2003 Texas study indicated a growing number of DL programs. Additionally, national and state professional conferences and research journals on bilingual and ESL education demonstrate an increasing interest in the research and implementation of DL programs. However, one significant feature that is absent from the literature on DL programs are costs associated with implementation and maintenance of DL programs. Information on funding of effective educational programs for ELLs is vital for all stakeholders, including policy makers and current and future DL program administrators.

While there has been some research into the costs of bilingual programs (Cardenas, Bernal & Kean, 1976; Chambers & Parrish, 1992), the research team was unable to find one study concerning the costs associated with the costs of dual language



programs above and beyond the costs of transitional bilingual programs. The previous research on bilingual costs may provide insight into DL costs; however, DL costs may differ from costs associated with traditional, transitional bilingual programs due to some significant programmatic differences (i.e. inclusion of English speaking students and parents, additional curriculum and assessment materials for English speakers, additional staff development training costs, additional costs for staffing, teaching and management,)

Our study examined many of the same cost structures as the Cardenas bilingual study; however, we included some funding costs that Cardenas, et al. (1976) intentionally excluded due to the different and specific nature of DL programs. For example, while the previous studies chose not to include in-service training (staff development) as it was a state requirement for all teachers, we considered DL programs to be in need of differentiated staff development to provide quality program support. After discussions with DL coordinators, it was confirmed that DL staff development was an additional funding need beyond the traditional, transitional bilingual staff development. “In this time of shrinking support for schools from tax based state funds, additional funds are needed from Title allocations to ensure the continued strength of DL programs. The subtle differences between DL and more traditional bilingual programs necessitate steady staff development and monitoring to ensure that the DL protocols are implemented in alignment with research-based designs” responded one administrator.

We also decided to include textbooks as a regular DL operating cost because of the need for DL programs to supply Spanish textbooks for the native English speakers enrolled in each campus program. We specified that these reported costs should only



include costs over and above the traditional, transitional bilingual program costs. We chose not to include library costs for similar reasons; bilingual library resources, while still not adequate in many cases, have improved dramatically since 1976. It was also difficult to say that DL library issues were any different than traditional, transitional bilingual library issues, and our purpose was to study the former. Since our study design was focused on DL campus costs, we did not include state agency administrative costs, but did include school administrative costs if the inclusion of a dual language program led to greater administrative costs than the transitional bilingual program. This differed from the prior studies as well, but it was impossible to ignore the costing of a dual language program administrator, secretary or parent involvement personnel and still offer a realistic cost analysis.

Central to conducting this survey was the key question: *How much more does a DL program cost to operate than a traditional, transitional bilingual program?* This is a complex question on a number of levels, not least of which is the nature of school budgeting. It was very important that we determine what, if any, differences in cost were related to program and teacher model. Last, we wanted to determine how much of these additional costs were related to geographic region, teaching model, program model, and program size.

Program size is an important variable due to the large disparity of pupil participation in the DL program from campus to campus. Obviously, a program with 20 students and one classroom will not require the managerial or support staff that a program



consisting of over 600 students will require. A second issue is that of program composition and its effect on program cost. While a prototypical or ideal DL program consists of relatively equal numbers of native English and native Spanish-speaking children, many programs have very different percentages of both, some as extreme as 99% Spanish speaking to one percent English-speaking.

The relatively large number of Spanish-speaking children in many dual language programs also has a confounding effect on the results of the cost analysis. As the previous Lara-Alecio, et al. (2004) study indicated a large number of DL programs were found in South Texas which have on average a larger percentage of ELLs than native English speakers. These border districts tend to be majority Hispanic and receive Title III funds for the majority of their student body, yet they also tend to be property-poor, mitigating the effects of any additional bilingual funds.

Other questions concerning costs guided this study. *Assuming the dual language class is not appreciably smaller than the typical bilingual classroom, what would be the additional instructional costs, material costs, and parent involvement costs?*



Methodology

Our study was developed as a descriptive study to provide an in-depth understanding of costs related to DL programs. Additionally, there are descriptive comments by the bilingual directors or campus administrators which provide additional data for understanding the needs and reasons for costs as they are in DL programs.

Definition of DL Program

For the purpose of this study, we defined a DL program as an instructional bilingual education model integrating both native English speakers and native Spanish speakers in content classes taught in both languages and with a goal of bilingualism and biliteracy for both language minority and language majority students. We required at least 10% English-speaking students for inclusion in the DL program. The state average is approximately 40% English-speaking students in DL programs (Lara-Alecio, et al., 2004).

Participants

Participants for our study were purposefully selected. They included 304 identified bilingual directors, the 166 Dual language coordinators identified in the Lara-Alecio, et al. (2004) study. Emails were gathered from the Texas A&M University's Language Diversity Network (<http://ldn.tamu.edu>), the Texas Center for Bilingual/ESL Education (<http://www.tcbee.org>), from school district websites, and from a superintendent email list provided by the Texas Education Agency. Actually, all 1042 superintendents received an email as a notification of the survey. The email requested that they submit the request to the bilingual director or the principal of the school should



they be implementing a DL program. This was sent as a precise effort to determine any previously unidentified DL programs in the state.

Instrument

After conducting a thorough review of the literature related to bilingual and dual language program components, the research team, consisting of university faculty and researchers with the aid of school finance personnel, developed a DL campus survey. The survey consisted of 91 items. The survey was reviewed by an economist for accuracy and was pilot tested with bilingual administrators and DL teachers in both a paper and online format. The survey is included in Appendix A. A second, shorter survey of fourteen items was also developed for the district level, Appendix B. This survey was designed to briefly gather district information and was not used in the final cost-analysis. The surveys, in both formats, were deemed to have internal consistency ($\alpha=.90$) and face validity.

Procedures

After completing our study of the number and features of DL programs in Texas (Lara-Alecio, et al., 2004), we had a contact list of administrators of DL programs in Texas. We utilized this list to send an e-mail invitation to participate in our survey. To insure we also reached those districts with DL programs initiated after our last survey, we utilized a comprehensive list of Texas district superintendents and sent a similar email letter inviting participation the first of October 2004. After two weeks a second email invitation and phone calls were placed to the known 166 DL programs. During October



2004, 93 online responses were received representing a 56% response rate. Eighty-eight (50%) of the surveys were determined to be useable.

Results

Demographics

Ninety-three DL cost surveys were completed online in Fall 2004. After review by the research team, ten surveys were omitted due to missing data or after it was determined that the programs were not DL programs as defined for the purpose of this study but in fact were one-way developmental or foreign language programs. Table 3 reveals that 48 schools districts with DL programs completed the survey; and 83 DL programs consisting of 27 small-size programs, 31 medium-size programs and 25 large-size programs. For the purpose of the study a small DL program was comprised of 10-120 students; medium DL program = 121-240 students; and large programs = 240+ students. The researchers made these category distinctions based on the average number of students in DL programs that had one DL class per grade level (small program), two-classes per grade level (medium program), and three or more classes per grade level (large program). Over 67% of the responses were 50:50 programs. 50:50 DL program may be overrepresented in the cost analysis since the Lara-Alecio, et al. (2004) study found that 53% of the state's DL programs were 50:50 models; however, it may reflect the noted trend in the growth of 50:50 programs in contrast to 90:10 models.



Table 3***DL Survey Response Demographics***

	Districts	Programs	Students	50:50	90:10	Small Programs	Medium Programs	Large Programs
Total	48	83	16,231	56	27	27	31	25

Note: 50:50 = 50:50 DL Program Model; 90:10=90:10 Program Model; Small Programs = 0-120 Students; Medium Programs = 121-240 Students; Large Programs = 240+ Students

Another distinctive feature of the reporting DL programs was the mean age of the programs by program size. Small programs reported a mean age of three years. Medium size programs were on average six years old and large programs were on average almost five years in implementation.

In an attempt to ascertain that our responses were geographically representative of the known DL programs, we then divided the state into four regions (Northeast, Southwest, East and South). We then tabulated responses by regional education service center area (1-20). Table 4 reports that the majority of responses (45.12%) were in the Eastern Region which included the Houston and Dallas Metroplexes and the Southern Region (35.37%) which included the Rio Grande Valley. The third largest reporting region was the Southwest (15.85%) which included the El Paso area, another area of high concentration of known DL programs. The Northwest Region reported few programs (3.6%). These data reflect the regional distribution of DL programs found in the Lara-Alecio, et al. (2004) study.



Table 4

Responding DL programs by Texas Region

Region	Northwest	Southwest	Eastern	Southern
DL Programs	3	13	37	29

Note: Northwest= Regions 9, 14, 16, and 17; Southwest= Regions 15, 18, and 19; Eastern=Regions 4, 5, 6, 7, 8, 10, 11, and 12; Southern= Regions 1, 2, 3, 13, and 20.

Figure 5 illustrates the grade levels of the reporting dual language programs. This figure is comparable to the data by grade level from the Lara-Alecio, et al. (2004) study. It is evident that the majority of the programs in the current study are concentrated at the early elementary grades. Grades 6-12 drop in number significantly. In fact, only one high school program is included in the current study.

Grade Levels of Reporting Dual Language Programs

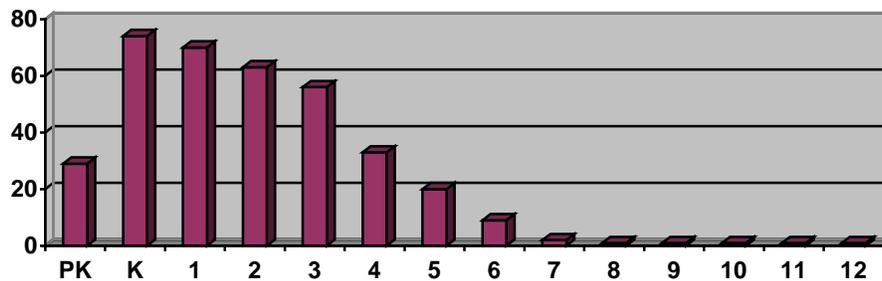


Figure 5. Grade Levels of Reporting DL Programs.



Per-pupil Costs

Per-pupil costs were calculated by small, medium and large DL program models for start-up years, annually and additional funds that the DL program administrators reported that they needed to adequately support their current DL programs. The research team determined, after discussions with administrators of current programs, that there may be differences in start-up year costs and ongoing annual costs and in size of programs. Also, administrators frequently report that they do not have sufficient funds to maintain current program levels; therefore, another category, “additional needed funds,” requested these amounts.

Table 5 reveals that the average per pupil start-up costs and the average per pupil annual costs for DL programs are approximately \$500.00. Programs requested an additional \$263.00 per pupil. This table calculates costs across program type and instructional model.

Table 5

Mean Per-Pupil Costs for All Reporting Programs Over and Above Transitional Bilingual Program

	Start-up Costs	Annual Costs	Additional funds
Reporting DL Programs (n=83)	512	525	263

Table 6 reveals that smaller programs (0-120 students) were more costly per pupil to operate in all three categories: start-up, annual and additional funds requested.

Conversely, large programs were the most cost effective in all three categories. Large



programs spent approximately 1/3 of the amount per pupil compared to small programs.

We speculate that the reduced costs for large programs is due to minimized teacher and students recruitment for the program, shared resources and materials, reduced staff development costs, larger percent of bilingual students in the district with associated Title III allotments, history of bilingual education programs and funding therefore having opportunities to purchase bilingual materials. Likewise, medium programs spent less than 1/2 the amount per pupil than small programs in all three categories.

Table 6.

Mean Per-Pupil Costs for Start-Up, Annual and Additional Funds Needed by Program Size

Program Size	Start-Up	Annual	Additional
Small Program (n=27)	825	879	568
Med. Program (n=31)	399	406	209
Large Program (n=25)	312	290	197

Note: Small Programs = 0-120 Students; Medium Programs = 121-240 Students; Large Programs = 240+ Students; Start-Up = Costs required to initiate program; Annual = yearly program costs; Additional = additional funds requested to maintain adequate program.

50:50 v. 90:10 Cost Differences

Since the Lara-Alecio, et al. (2004) study found approximately equal proportions of 50:50 and 90:10 DL programs, the research team was interested if there were cost differences associated with the two most common DL program models. Table 7 reveals these data. Notably, Table 7 indicates approximately equal per pupil costs annually and equal requested additional funds for 90:10 and 50:50. There appears to be no significant difference in mean per pupil annual costs or requested additional funding associated with the two most common DL program models in Texas.



Table 7***Mean Per-Pupil Annual and Additional Costs as Reported by 50/50 and 90/10 Instructional Models***

DL Model	Annual	Additional
90:10 Model (27)	389	246
50:50 Model (56)	388	238

Note: 50:50 = 50:50 DL Program Model; 90:10=90:10 Program Model; Annual = yearly program costs; Additional = additional funds requested to maintain adequate program.

Teacher Models

After reviewing the literature and discussions with DL administrators, three typical teacher arrangements or administrative models were revealed. The three distinct teacher arrangements are: (a) two-teacher mixed; (b) one-teacher mixed; and (c) two-teachers separated. *Two-teachers mixed* was the most common arrangement (n=39) and *two-teachers separated* was the least common (n=13). See Table 8. The two-teachers mixed model is one in which students are being served by two different teachers, one in Spanish, the other in English, for differing periods of the day or week. Native English and native Spanish speakers are mixed within the same class group. This model typically represents (minimally) two classes of students (approximately 40 students) which rotate between English and Spanish instruction in a “team-teaching” type situation in which planning, curriculum materials, and paraprofessionals are usually shared. The two-teacher mixed model is the least expensive model.

The *one-teacher mixed*, the second most common model, is one in which native English and native Spanish DL students are being served by a single bilingual teacher instructing in both Spanish and English for different periods of the school day or week. Usually, this model requires hiring an additional teacher who is bilingual certified to



serve as the DL teacher which may contribute to the expense of this design. This model was the most costly model reported.

The *two-teachers separated* model is one in which students are being served by different teachers, one in Spanish, the other in English, for differing periods of the day or week. Native English and native Spanish speakers are separated into different class groups, which are then switched for shifts in language of instruction. The *two-teachers separated model* (n=13) was the least reported and the second most expensive per pupil. Often such models require additional instructional support, such as an instructional aide, since students in this grouping are not mixed by language and therefore are not able to provide one another with language clarifications, i.e., clarifying the English instruction with Spanish or the Spanish instruction with English (Lara-Alecio & Parker, 1994). Additionally, this model does not foster collaborative planning and sharing of resources. These factors may contribute the significant difference in cost between the two-teacher mixed model and this one.

Table 8
Mean Per-Pupil Annual and Additional Costs as Reported by Three Administrative Program Models

Teacher Model	Annual	Additional
Two-Teachers Mixed (n=39)	297	231
One-Teacher Mixed (n=31)	522	241
Two-Teachers Sep. (n=13)	448	277

Note: Two-Teacher Mixed= One Spanish speaking teacher and one English speaking teacher “team teaching” two mixed groups of native English and Spanish DL students. One-Teacher Mixed= One bilingual teacher serving one class of DL students (mixed group of native English and Spanish speakers). Two-Teachers Sep= Two-teachers separated serving native English and Spanish speakers in separate classrooms. The two language groups are separated.



Cost Categories

The survey requested information on 12 categories associated with dual language programs. Respondents were asked to determine mean start-up², annual³, and additional requested costs across 12 cost categories above and beyond their expenditures for traditional transitional bilingual programs. The 12 categories were: managerial, staff, instruction, staff development, Spanish curriculum, English curriculum, assessment, equipment, recruitment, public relations, parental involvement and other materials. Following is a brief explanation of each category.

Managerial costs include costs associated with professional staff needed to operate the DL program such as a Dual language coordinator. This managerial staffs were solely dedicated to the dual program.

Staff costs include were associated with staff needed to operate the DL program such as a clerk/typist, secretary, parent liaison or/and assessors.

Instructional costs include costs associated with instructional staff dedicated to the dual program that otherwise would not be on campus such as teachers, paraprofessionals, tutors, etc.

Staff Development/Training costs were for both staff and teachers focused on dual language programs such as site visits, conferences, travel, registration, on-site presentations, etc. over and above the required five state days.

² Start-up costs include, but are not limited to, initial costs associated with planning, training, purchasing, and recruiting prior to program implementation.

³ Annual costs are those costs associated with normal operations of the program in one academic year.



Curriculum material costs were for Spanish speakers learning English (i.e. leveled readers, texts, videos, audio books, computer software, etc.) over and above those needed for the traditional bilingual classroom.

Curricular material costs were for English speakers learning Spanish (i.e. leveled readers, texts, videos, audio books, computer software, etc.) over and above those needed for the traditional bilingual classroom.

Assessment material costs were for English and Spanish speakers over and above those needed for the traditional bilingual or mainstream classroom.

Equipment costs were necessary to the proper functioning of the program (for example: card readers, listening stations).

Recruitment costs were included for both students and teachers (newspaper, radio, television, meetings, flyers) These costs were over and above the typical school-home communications.

Public relations costs included items such as videos, brochures, and meetings. These costs were over and above the typical school-home communications.

Parental involvement costs included parental instructional or orientation programs during or after school. These include L2 language programs and academic support for families.

Other material costs included unanticipated costs reported by programs.

Start-up Costs. Table 10 details the mean start-up costs across the 12 categories for small, medium and large programs.



Table 10***Mean Start-up Costs by Program Size above Typical Transitional Bilingual Program Costs***

Costs Category	Small	Medium	Large
Managerial	14333	19616	27800
Staff	3148	7823	9409
Instruction	1548	9633	9400
Staff Development	6986	6557	18113
Spanish Curriculum	3480	6513	20499
English Curriculum	3572	6352	12297
Assessment	1522	1447	5060
Equipment	1389	1961	6339
Recruitment	178	911	790
Public Relations	946	484	1104
Parental Involvement	744	2695	5193
Other Materials	667	758	2542
TOTAL	38513	64750	118546

Category Costs: 12 major cost categories; small=small DL program; medium= medium DL program; large=large DL program.

The largest costs for all three DL groups were associated with managerial costs. While many may believe managerial costs to be overstated, one principal indicated, “While the program can be sustained at an adequate level, the loss of managerial and support personnel will impact the program’s effectiveness. Once the additional funding ends, the bilingual department which already has a huge case load will have to consider ways to maintain positions.” The smallest costs across the three groups were associated with recruitment. All three groups reported start-up costs associated with instruction and staff development. Instruction costs were similar for medium and large programs and staff development costs were similar for small and medium programs. Large programs needed over \$18,000 for start-up training and staff development.



Two areas of concern for funding in DL programs are costs associated with serving the native English speakers in the DL program. State or federal Title III allotments cannot be used to purchase materials or fund instruction for non-ELL students. One principal stated, “The district received Title VII funds and those funds were used to assist with start-up costs. State funds are needed to pay for additional Spanish textbooks for each of the non-ELL students in all content areas. This is one of our school’s biggest financial concerns. If native English speaking students are served in DL programs, the state should support the purchase of textbooks for the non-ELLs.” The survey indicated that DL Programs incurred start-up Spanish curriculum costs for the native English speakers on average of \$3480 for small programs, \$6352 for medium programs and 12,297 for large programs. Additionally, DL programs may need additional assessment materials for the native English speakers. Small programs reported assessment start-up costs of \$1522; medium programs reported assessment start-up costs of \$1447, and large programs reported assessment start-up costs of \$5060.

Annual Costs. Notably in Table 11, the largest annual cost category for medium and large programs is administrative costs. For small programs, the largest annual cost category is instruction. The total annual costs of a small program approaches the total costs associated with a medium program.



Table 11***Mean Annual Costs by Program Size above Typical Bilingual Program Costs***

Costs Categories	Small	Medium	Large
Managerial	15907	16626	23990
Staff	3444	8355	10037
Instruction	22185	15570	12451
Staff Development	4537	7115	20529
Spanish Curriculum	2676	4477	15120
English Curriculum	2787	4517	10058
Assessment	1354	1381	4200
Equipment	815	2645	6059
Recruitment	237	629	728
Public Relations	328	1203	838
Parental Involvement	752	2966	3533
Other Materials	815	445	2426
TOTAL	55837	65929	109969

Category Costs: 12 major cost categories; small=small DL program; medium= medium DL program; large=large DL program.

Table 12 reports costs associated with the three teacher/instructional models: (a) two-teacher mixed; (b) one-teacher mixed; and (c) and two-teachers separated. Notably, the two-teacher mixed model reports the smallest amount of annual expenditures. The two-teacher mixed model and the two-teacher separate model are similar in costs. The two-teacher mixed model was the least expensive model per pupil (see Table 8). The difference between the two-teacher mixed and the two-teacher separated models in costs appears to be in the areas of managerial support and instructional categories. The most costly teacher model is the one-teacher mixed model by nearly \$20,000.



Table 12

Mean Annual Funds by Teacher Model above Traditional Transitional Bilingual Program Costs

Cost Category	2 Teachers Mixed	1 Teacher Mixed	2 Teachers Sep.
Managerial	17928	17484	23342
Staff	6229	8742	6846
Instruction	14366	18941	18884
Staff Development	11289	10207	7659
Spanish Curriculum	6150	9819	3446
English Curriculum	3360	9819	2408
Assessment	1822	3389	635
Equipment	2230	4339	2615
Recruitment	426	813	177
Public Relations	1029	653	515
Parental Involvement	1804	3710	1169
Other Materials	1653	710	769
TOTAL	68286	88626	68465

Category Costs: 12 major cost categories; small=small DL program; medium= medium DL program; large=large DL program.

The next analyses depict cost category breakdowns as a percentage of annual costs by small, medium and large districts. Figure 6 illustrates that the largest percentage of costs were associated with instruction for small campuses. In fact, instruction and managerial costs represented over 73% of the total expenditures.



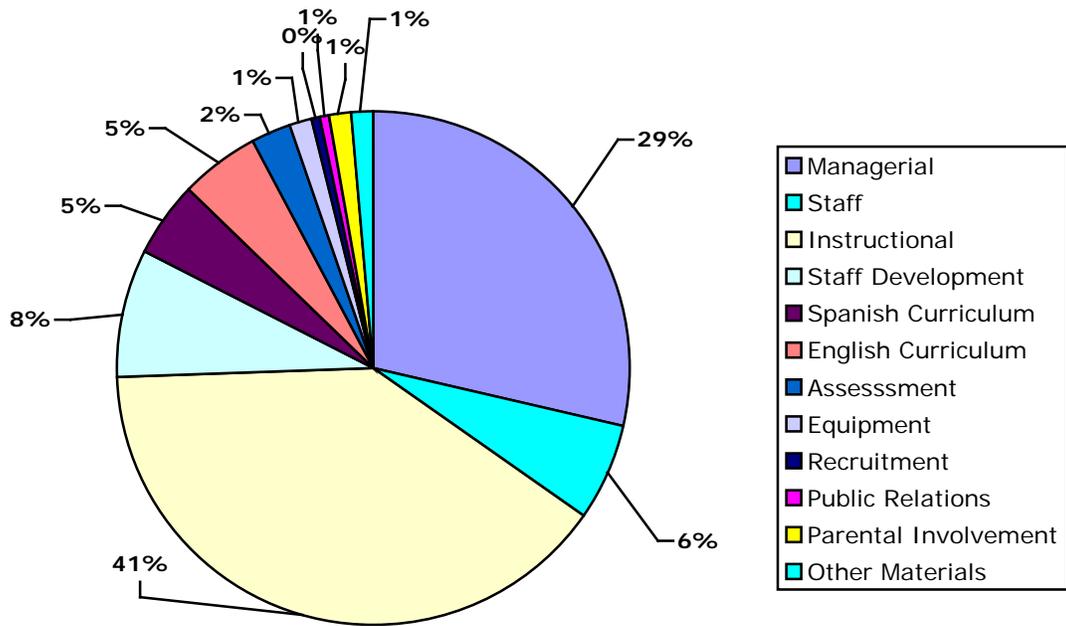


Figure 6. Percentages of Annual Costs per Category for Small Programs (0 – 120)

Figure 7 charts instruction, staff and managerial costs as 71% of the total expenditures for DL programs of medium size. Staff development costs were 11% of the total budget.



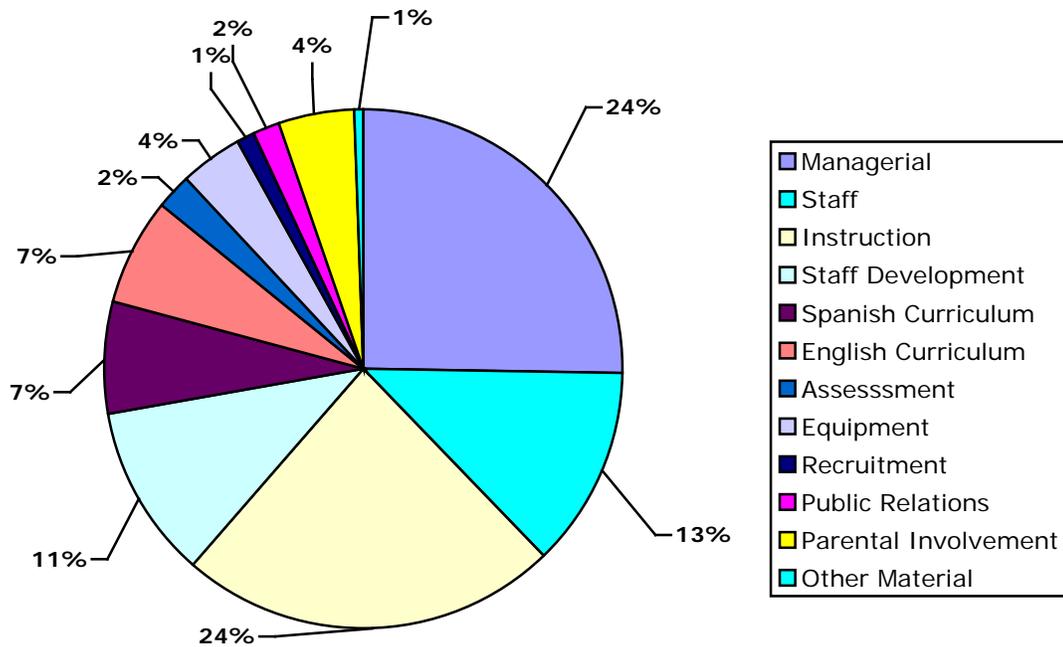


Figure 7. Percentages of Annual Costs per Category for Medium Programs (120 -239)

Figure 8 reveals that nearly one quarter of annual costs were associated with Spanish and English curriculum materials for large DL programs. Managerial and instructional costs are lower than that of medium and small programs. Staff development costs were higher than those of medium and small programs.



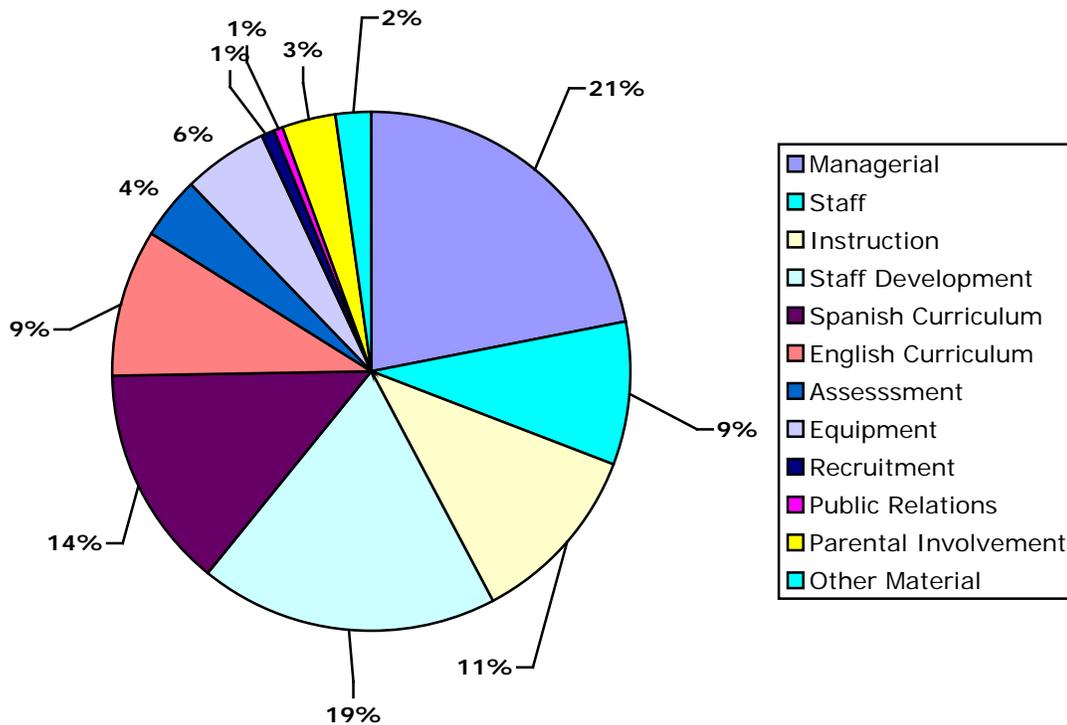


Figure 8. Percentages of Annual Costs per Category for Large Programs (240 and above).

Federal Funding

With the inception of the No Child Left Behind Act (2001), bilingual education was mandated. Prior to 2001, there were capacity-building policies that provided for additional funding to enhance local district efforts (McDonnell, 1994), rather than mandated policies for bilingual education. Many school districts applied directly to the U.S. Department of Education for supplemental funds such as those that supported start-up and continued implementation for dual language programs. Under this funding formula, funds could be used for native English speakers not eligible under the current



federal flow-through funds under the Title III allotment. Lara-Alecio et al. (2004) determined that DL programs in Texas were positively impacted by these USDOE capacity-building funds. Due to their typical three to five year funding cycles, many of the current DL programs are either out of federal monies or soon will be. Our current study indicated that 88% of large programs and over half of small (51.8%) and medium (54.8%) programs have received federal funds. Overall, 53 of the campus' DL programs (63%) received federal funding with an average award of \$498, 874 over a three to five year period. This number includes 22 large DL programs which may skew the data upward. Only three of the large programs did not report receiving federal funds. The significant federal support for DL programs contributed to the growth of DL models in Texas and calls into question the sustainability of these programs should an alternate funding source not be found. One dual language coordinator remarked, "Although we could maintain the program due to an already established school culture and commitment, we could not maintain the high expectations we have set without funding for personnel. The federal funds we received paid for a school coordinator, bilingual aides, a parent liaison, consultants, and tutors. These positions supported stronger recruitment efforts, instructional and parental support. The aides were able to support classroom teachers during the school day, and tutors provided small group instruction. The quality of our program overall increased greatly with these components."



Recommendations

Based on the current review of literature of effective practices, we believe that DL programs are viable bilingual models that promote bilingualism and biliteracy for both language majority and language minority students. The current study makes no link between dual language program costs and program effectiveness. One of our recommendations is to conduct an analysis of effectiveness of DL programs related to costs. Since there is a known sample of dual language programs, state achievement data could be drawn on that sample and compared to the associated costs.

Another recommendation is to perform a follow-up study of programs that received federal funding to determine the level of sustainability. We found the least costs per pupil were associated with the following: (a) Larger DL Programs and (b) Two-Teacher Mixed Model Programs. No difference was detected between 50:50 and 90:10 DL program designs in costs.

Our findings are based on actual expenditures above and beyond the traditional transitional bilingual education program. The data indicated that the average per pupil costs across programs sizes was \$525, so for a 24 student classroom, the estimated additional funds would be \$12,600. For a 24 student classroom under the two-teacher mixed model the costs for funding a DL program above and beyond the traditional, transitional bilingual program is \$7128. The reduced costs of the two-teacher mixed model plus the additional benefits of “team-teaching,” curriculum planning and sharing, and peer language clarifications lead us to recommend this teacher model, whether it is in a 50:50 or a 90:10 arrangement. Although not studied in our current research, we have a



related recommendation to the two-teacher mixed model, and that is to develop a dual language teacher certification process allowing for testing in a teacher's native language thereby strengthening both language components and potentially increasing the number of certified dual language teachers. Additionally, the state might consider assisting local districts with the increasing costs associated with bilingual and ESL teacher stipends in dual language programs.

A recurring theme within the data was the lack of funding for native English speakers who represent nearly 40% of the students served in DL programs in Texas. The need for additional curriculum and assessment materials in Spanish for these students is a financial challenge for these districts, many of which are low SES, Title I campuses. We recommend that the State determine alternative funding avenues for supporting these additional student costs.

Additionally, the State should reflect on the volume of programs that were fostered under capacity-building federal funding initiatives and now are facing a critical stage as this additional program funding has been depleted. The data revealed immediate concerns from campus and district administrators about sustaining adequate funding levels that would maintain program integrity. The State might consider a competitive grant process to pilot new programs and to sustain existing ones. We recommend that new programs to be funded begin at Kindergarten adding one grade level per year. Programs should be maintained at least through middle school. The study provided insight into the actual start-up and annual costs by program size over and above transitional bilingual program costs; we recommend for small programs that the average start-up cost allocations should minimally approximate \$39,000 and annual cost



allocations should minimally approximate \$56,000. As programs grow in size, as is expected as grade levels and additional classrooms are added, the program allocations must increase accordingly.

The study results are strong and timely related to the costs of educating the nearly 16,500 students represented in this sample. Dual language programs can assist students in becoming fully biliterate citizens of Texas who can serve as a unique linguistic, cultural, and economic resource, who are much needed for the constructive future of our State.

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Appendix A



Appendix B

