



# Promoting Bilingualism and Biliteracy: Programmatic Difference between One-way Dual (Developmental Bilingual) Language and Transitional Bilingual Models

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# Introduction



- ❖ A well-known fact is that an increasing number of children enter school with a home language of Spanish (Suárez-Orozco & Páez, 2002). In Texas, alone, over 731,304 students were served in ELL programs in 2006-2007, accounting for 16% of the school population (TEA, 2007) with over 90% Spanish speakers and 87% of those economically disadvantaged (Gonzalez, 2007).
- ❖ Bilingual education incorporates minority students' native/first language (L1) in instruction. In its many forms, developmental bilingual education (DBE, or one-way dual language) seems to be most promising in maintaining students' L1 while enhancing their English (i.e., L2) (Thomas & Collier, 2002); while transitional bilingual education (TBE) is considered a subtractive model (Ovando, Combs, & Collier, 2006).
- ❖ Programs greatly vary in terms of instructional practices, curriculum design, district recourses, professional development, and parental training. Questions arise about the congruency between program designation and operation (Torres-Guzmán, Kleyn, Morales-Rodríguez, & Han, 2005).

# Purpose



- ❖ We provide a detailed description of a Spanish/English DBE model, which implements an enhanced/interventional curriculum supporting students' language and literacy development in Spanish and English.
- ❖ We evaluate the effectiveness of this DBE model as compared to a traditional TBE model in light of students' learning outcomes in language and literacy acquisition in both Spanish and English longitudinally from kindergarten through second grade.

# Review—TBE



- ❖ The most common L1 instructional model in the United States.
- ❖ Goal: to enhance students' English language skills in a certain period of time and finally mainstream them. Students' L1 is used at the early stage of instruction, all other instruction is in English, with L1 used only as a support for clarification. As students approach higher grade, the use of L1 quickly phases out (Lara-Alecio, Irby & Meyer, 2001).
- ❖ Synonymous to early-exit TBE, a subtractive or remedial instructional model that encourages English performance at the earliest date possible without continued support in native language development (Genesee, 1999; Ramirez, Yuen, Ramey, & Pasta, 1991).
- ❖ Does not aim for bilingualism (i.e. to communicate in both languages) or biliteracy (i.e. to read and write in both languages).

# Review—DBE



- ❖ Used interchangeably with one-way dual language, one-way developmental, maintenance bilingual, and late-exit bilingual (Genesee, 1999; Lindholm-Leary, 2001; Ramirez et al, 1992; Thomas & Collier, 2002).
- ❖ It provides strong grade-level schooling throughout the elementary school years, and gradually increases the amount of instruction in English with each year until 50 percent of the content instruction is in English by fourth grade. It aims to promote high levels of academic achievement in all curricular areas and full academic language proficiency in L1/L2.
- ❖ DBE distinguishes itself from two-way dual language in the composition of students who are from the same linguistic and ethnic background with limited or no mastery of English (Genesee, 1999; Gomez, Freeman & Freeman, 2005; Mora, Wink, & Wink, 2001).
- ❖ The allocation of instructional time in L1 and L2 may vary across program types and Collier and Thomas (2004) have identified 90/10 and 50/50 as two major patterns of one-way dual language/DBE program.

# Review—Program Effectiveness



- ❖ In an 80/20 DBE program, regardless of students' initial level of Spanish oral proficiency, students consistently scored at or above Texas norm on reading and math standardized test in Spanish (Medina, 1991)
- ❖ All MBE participants have acquired significant levels of English and students with lower Spanish oral proficiency demonstrated the greatest gain in their oral English development as compared their fluent counterparts. The authors concluded that MBE models might be the best alternative to serve ELLs and yet they are the least implemented (Medina and Escamilla, 1992a)
- ❖ Although students placed in both TBE and MBE models made statistically significant improvement in oral English proficiency from kindergarten to second grade, additive effects of MBE emerged in that students' oral proficiency in L1 was maintained (Medina & Escamilla, 1992b)

# Review—Program Effectiveness



- ❖ Only students in two-way bilingual model and 50/50 DBE model can reach 50<sup>th</sup> percentile in both L1 and L2 in all subjects or even a higher level after four to seven years participating in the program (Thomas & Collier, 2002)
- ❖ Students attending either DBE or two-way dual language models achieved at grade-level or above grade-level in standardized English and Spanish reading tests with an annual effect size of .14 or higher (Collier & Thomas, 2004)

# Review—Summary



- ❖ Empirical studies have suggested that DBE is one of the best pathways to bilingualism, biliteracy, and multiculturalism as well as academic success (Krashen 1996; Lindholm-Leary, 2001; Ramirez, Yuen, Ramey, & Pasta, 1991; Slavin & Cheung, 2005; Thomas & Collier, 2002).
- ❖ Many of the quantitative studies did not provide a full array of description on the instructional programs. Likewise, existing researches fail to provide a basis for a valid conclusion as what type of accommodations or adaptations that are most effective for ELLs because there is a disconnection between “instructional effectiveness” and rich description on effective strategies (Snow, 2006) or between program labeling and implementation (Torres-Guzmán, Kleyn, Morales-Rodríguez, & Han, 2005), thus, making replication almost impossible.
- ❖ Attention should also be drawn upon various DBE models other than 90/10 and 50/50 (80/20 in Medina & Escamilla, 1992a).
- ❖ Very few studies reviewed in this section have randomized participants or followed same groups of participants longitudinally.



- ❖ **Our study is part of an on-going longitudinal randomized trial project targeting at Hispanic English learners' English language and literacy acquisition (project ELLA), from kindergarten through 3<sup>rd</sup> grade.**
- ❖ **Large School District in Southeast Texas**
  - **Urban**
  - **Recognized**
  - **65% Hispanic**
  - **89-98% low socio-economic status**
  - **7 elementary schools**

# Location of the Research



- ❖ **Same groups of students were followed from Kindergarten to second grade in both treatment and comparison conditions.**
- ❖ **Participants include bilingual students:**
  - **DBE (experimental): Most content taught in Spanish, except for an enhanced ESL block, 75-90 minutes**
  - **TBE (control): Most content taught in Spanish with a 45 minute ESL block**

# Description



## Developmental Bilingual Education (DBE, enhancement)

N=280

- ❖ **70%(Spanish) /30% (English)**
- ❖ **90 minutes structured ESL Intervention (K)**
- ❖ **75 minutes structured ESL Intervention (1<sup>st</sup> & 2<sup>nd</sup> ), Tier 1 increased English than in TBE**

## Transitional Bilingual Education (TBE, typical practice)

N=180

- ❖ **80%(Spanish) /20% (English)**
- ❖ **ESL – 45 minutes**

# Description—Intervention Components



- ❖ **DBE students receive structured ESL instruction for 75-90 minutes daily**
- ❖ **The curriculum focuses on increasing student achievement in both language and academic content**
  - **Kindergarten and first grade emphasized oral language development**
  - **Second grade focused on direct teaching of reading fluency and comprehension**
  - **Third grade features content area reading through science**



- ❖ **10 minutes daily**
- ❖ **Targets science vocabulary**
- ❖ **Provides sentence using words in context**
- ❖ **Asks a daily question using the target word**
- ❖ **Presents visual aides for comprehension**
- ❖ **In second grade, this component became Daily Oral and Written Language (DOWL)**



- ❖ **Story Telling and Higher Order Thinking for English Language and Literacy Acquisition**
- ❖ **35min daily**
- ❖ **Uses authentic children's literature**
- ❖ **Utilizes Bloom's Taxonomy for questioning**
- ❖ **Integrates science concepts & vocabulary**
- ❖ **L1 clarifications (paraprofessional)**
- ❖ **5-Day scripted lesson (1 book/week)**



- ❖ **35 minutes daily**
- ❖ **Promotes oral language development**
- ❖ **Models syntax and sentence structure to encourage students to speak in complete sentences**
- ❖ **Helps students build social and academic language**
- ❖ **Integrates content-based instruction**
- ❖ **Incorporates small group/pair activities**
- ❖ **Supports phonemic awareness**



- ❖ **45 minutes daily**
- ❖ **Daily, explicit, and systematic instruction**
- ❖ **Incorporates five strands of reading:**
  - **Phonemic awareness**
  - **Letter-sound correspondence**
  - **Word recognition and spelling**
  - **Fluency**
  - **Comprehension**

# Comparison Students



- ❖ The TBE students received regular ESL instruction approximately 45-60 minutes daily with great variation across teachers.
- ❖ Code switching to clarify and explain English concepts.
- ❖ Language developmental approach: oral & listening skills in Spanish to English → reading & writing skills from Spanish to English.
- ❖ Curriculum aligned with the state of Texas standards. Each grade level transitions from Spanish to English in the typical program through oral language development that the teacher provides and through music, art, and physical education beginning in kindergarten. Students who pass Spanish language arts began formal English instruction by spring semester of 1<sup>st</sup> grade. At 2<sup>nd</sup> grade, English began to be introduced in ESL, social studies, science, and with English reading lessons, while Spanish language arts and math continue. No support was provided by the research team.
- ❖ As in a typical practice of TBE model, several cases occurred at the end of 1<sup>st</sup> and 2<sup>nd</sup> grade that students were exited from their classrooms.

# Measures



- ❖ The same comprehensive battery of measures in language and literacy was administered in both English and Spanish to all participants by well-trained professionals.
- ❖ Constructs tested include oral language proficiency, phonological processing, rapid naming, decoding skills, reading comprehension, and reading fluency. Pretest performance was used as the covariate for posttest performance on the same measure.
- ❖ Data were collected at the beginning and end of kindergarten (2004-2005), end of kindergarten, beginning of 1<sup>st</sup> grade (2005-2006), and end of 2<sup>nd</sup> grade (2006-2007).

Measures	K-BOY	K-EOY	1 <sup>st</sup> -BOY	1 <sup>st</sup> -MOY	2 <sup>nd</sup> -EOY
Letter Name	√	√			
Letter Sound	√	√			
Rapid Letter Naming	√	√			
Rapid Object Naming	√	√			
Blending Words	√	√	√		√
Segmenting Words	√	√	√		√
Picture Vocabulary	√	√	√		√
Listening Comprehension	√	√	√		√
Oral Vocabulary			√		√
Memory for Sentences			√		√
Letter-word Identification			√		√
Word Attack			√		√
Passage Comprehension			√		√
Oral Reading Fluency				√	√

# Results—English



- ❖ Naming: no different in naming English letters ( $p > .05$ , effect size .23) after controlling for pretest levels. In Rapid Object Naming, DBE students scored higher with a marginally significant difference and small effect size,  $F(1, 488) = 3.89$ ,  $p = .049$ , effect size = .12, whereas no difference found in Rapid Letter Naming test ( $F < 1$ ,  $p > .05$ ).
- ❖ Phonological Processing: DBE students outperformed TBE students on English CTOPP Blending Phonemes into Words subtest,  $F(1, 257) = 7.50$ ,  $p < .01$ , effect size = 0.44; and Segmenting Words subtest,  $F(1, 235) = 38.38$ ,  $p < .001$ , effect size = 0.71.
- ❖ Oral Language: The performance levels of the two groups on all oral language subtests were significantly different,  $F_s > 4.75$ ,  $p_s < .03$ , effect sizes  $> 0.27$ , all favoring DBE students.
- ❖ Decoding: Performance on English measures of decoding skills indicated that DBE students outperformed TBE students after adjustment for pre-test performance levels,  $F_s > 10.33$ ,  $p_s < 0.001$ , with effect sizes of over 0.4.
- ❖ Reading Fluency and Comprehension: After adjusting performance levels at pre-test in the middle of 1<sup>st</sup> grade, significant difference was in favor of DBE group,  $F(1, 234) = 5.16$ ,  $p = 0.02$ , with a small effect size of 0.16. Performance levels were also significantly different in reading comprehension with effect size of 0.46 favoring DBE students

Measure	Group	n	Pre M	Pre SD	Post M	Post SD	d	F	<i>P</i> <
Letter Name	3	302	5.71	6.77	13.04	7.71	0.23	1.62	0.20
	4	186	6.93	7.32	14.76	7.44			
Letter Sound	3	302	7.00	7.24	15.65	6.77	0.01	0.47	0.49
	4	186	7.30	7.06	15.55	7.06			
Rapid Object Naming	3	302	208.15	54.72	146.55	64.87	0.12	3.89	0.05
	4	187	199.51	59.63	154.78	68.52			
Rapid Letter Naming	3	302	226.81	41.71	190.84	73.58	0.12	0.80	0.37
	4	187	221.81	49.52	181.64	78.36			
Blending Words	3	138	11.96	3.57	15.39	3.01	0.44	7.50	0.01
	4	123	10.97	3.39	13.89	3.74			
Segmenting Words	3	138	7.75	3.76	11.32	4.19	0.71	38.38	0.00
	4	123	7.69	4.63	8.50	3.76			
Picture Vocabulary	3	138	60.25	16.43	76.80	16.83	0.56	9.05	0.00
	4	122	62.61	30.94	66.59	19.58			
Listening Comprehension	3	138	54.60	19.52	74.41	12.23	0.48	15.35	0.00
	4	121	47.27	22.00	67.88	15.07			
Memory for Sentences	3	133	75.08	12.74	87.36	14.35	0.27	4.75	0.03
	4	119	74.20	13.78	83.21	12.53			
Oral Vocabulary	3	133	81.33	14.12	87.55	13.04	0.30	5.01	0.03
	4	120	74.11	17.52	83.42	12.64			
Letter-Word Identification	3	131	97.22	23.35	121.11	19.81	0.52	16.84	0.00
	4	119	99.91	22.13	111.14	17.67			
Passage Comprehension	3	133	98.04	14.80	102.26	9.36	0.46	13.72	0.00
	4	120	97.63	15.01	97.07	11.10			
Word Attack	3	133	100.96	25.96	116.05	16.48	0.40	10.33	0.00
	4	120	99.63	28.14	109.12	16.37			
Oral Reading Fluency	3	118	21.13	22.63	91.51	29.25	0.16	5.16	0.02
	4	116	31.11	23.61	86.72	34.28			

# Results—Spanish



- ❖ Naming: Adjusting for pre-test performance, DBE students outscored TBE students in naming Spanish letters,  $F(1, 489) = 10.75, p < 0.001$ , effect size = .25. No difference was found in Letter Sound, ( $F_s < 2, p_s > .05$ ), with negligible effect sizes of 0.004 and .08.
- ❖ Phonological Processing: statistically significant difference was identified on Spanish TOPPS Blending Phonemes into Words subtest,  $F(1, 259) = 9.14, p < .001$ , effect size = 0.38; and Segmenting Words subtest,  $F(1, 259) = 4.14, p = .04$ , effect size = 0.21, in favor of DBE
- ❖ Oral Language: no difference on most of the WLPB-R oral language subtests ( $p_s > .05$ ), controlling for pretest performance, with small effect sizes (0.03 to 0.24). The only difference was found in the subtest of Listening Comprehension in that DBE students outperformed TBE students,  $F(1, 257) = 4.36, p = .038$ , with a small effect size of 0.19.
- ❖ Decoding: TBE student scored significantly higher than did DBE students on WLPB-R word-level measures (Letter-word Identification and Word Attack), with moderate effect sizes (-0.6 and -0.51, respectively).
- ❖ Reading Fluency and Comprehension: no difference was found in word reading fluency. The effect size for difference was small (-.26). Performance on measure of reading comprehension indicated that DBE students outperformed TBE students,  $F(1, 251) = 12.69, p < 0.001$ , with a moderate effect size of 0.38.

Measure	Group	n	Pre M	Pre SD	Post M	Post SD	d	F	<i>P</i> <
Letter Name	3	302	17.91	8.80	26.57	4.33	0.25	10.75	0.00
	4	187	18.33	9.37	25.17	6.55			
Letter Sound	3	302	17.13	9.73	27.12	4.02	0.26	8.50	0.00
	4	187	18.58	9.52	25.80	6.08			
Rapid Object Naming	3	299	141.03	71.28	111.23	42.39	0.00	0.89	0.35
	4	179	159.63	82.09	111.05	44.50			
Rapid Letter Naming	3	264	206.16	107.64	106.49	68.20	0.08	1.57	0.21
	4	153	224.27	102.10	100.91	67.77			
Blending Words	3	138	12.87	3.80	16.16	2.85	0.38	9.14	0.00
	4	123	12.52	4.14	15.01	3.18			
Segmenting Words	3	138	10.34	6.65	16.03	3.86	0.21	4.14	0.04
	4	123	10.88	6.23	15.21	3.91			
Memory of Sentences	3	140	81.97	12.16	84.76	9.36	-0.24	3.51	0.06
	4	120	82.50	13.23	86.49	9.62			
Picture Vocabulary	3	140	94.97	27.25	100.06	22.15	0.11	0.12	0.73
	4	120	90.93	26.04	97.13	22.13			
Oral Vocabulary	3	140	86.16	18.78	97.58	18.51	-0.03	1.96	0.16
	4	120	80.67	26.32	97.59	19.09			
Listening Comprehension	3	140	88.29	15.92	94.85	10.07	0.19	4.36	0.04
	4	120	88.60	13.88	92.40	12.17			
Letter Word Identification	3	140	139.83	25.70	151.21	20.90	-0.60	21.00	0.00
	4	120	143.38	24.94	161.40	21.22			
Passage Comprehension	3	140	109.22	16.33	107.76	8.67	0.32	12.69	0.00
	4	120	111.89	15.61	104.72	9.51			
Word Attack	3	140	123.34	21.85	133.30	19.70	-0.51	11.51	0.00
	4	120	129.11	20.56	141.97	20.30			
Oral Reading Fluency	3	118	42.78	19.33	84.21	26.92	-0.26	0.56	0.46
	4	116	48.38	21.84	92.08	31.86			

# Discussion—English



- ❖ All significant findings were in favor of treatment group, reflecting a range of oral and reading proficiency in English, including phonological processing, decoding skills, oral language, reading fluency and comprehension, with effect sizes ranging between .19 and .71.
- ❖ Although both group of students made meaningful gains in oral language development, however, by the end of 2<sup>nd</sup> grade, the overall performance level of treatment group was still 1.23 standard deviations below the normative value and the overall performance level of control group was 1.65 standard deviations below the normative value.
- ❖ The ultimate goal of reading includes high reading fluency and comprehension (Vaughn et al., 2006). DBE students demonstrated statistically higher performance than TBE students on contextualized word reading fluency. Although TBE students had outscored DBE students in oral reading fluency middle of 1<sup>st</sup> grade, at post-test in 2<sup>nd</sup> grade, DBE students correctly read 92 words per minute higher than TBE students (86 words per minute). According to level designation in DIBELS, performance of 90 words per minute or higher is considered reading with low-risk.

# Discussion—Spanish



- ❖ On average, DBE students outperformed TBE peers in letter naming, phonological processing, listening comprehension and reading comprehension, with effect sizes ranging between 0.19 to 0.38. The performance levels of both groups were higher than that of English measures.
- ❖ On measures of oral language, no difference was found between the two groups except for the Woodcock Memory for Sentences subtest. Post-test performance in 2<sup>nd</sup> grade for both groups was approximating the normative value by less than 0.4 standard deviations.
- ❖ TBE students demonstrated higher levels in Spanish decoding skills than did DBE students, which could have been a result of more time in Spanish instruction. However, the average scores in both groups were at least 2 standard deviations above the normative value at post-test in 2<sup>nd</sup> grade, indicating an average of full mastery of the foundational skills necessary for successful subsequent reading.
- ❖ No difference was found between two groups of students in reading fluency,

# Conclusions



- ❖ Findings are consistent with preliminary results of a two-year study of this project (Lara-Alecio, Irby, Mathes, Tong, Rodriguez, & Quirios, et al., 2007). Findings are also congruent with studies that support DBE as an additive model promoting oral proficiency in L1 and L2 (Medina & Escamilla, 1992a).
- ❖ Little is known about the effect of literacy instruction in one language on the literacy development in the other language for English language learners (Vaughn, et al., 2006b). In this study, gains in English literacy acquisition appear to influence the gain in Spanish literacy particularly for students in DBE models, as compared to students in TBE models. One might argue for the decreased Spanish instructional time in the DBE model (70/30) that reduced students' exposure to L1, however, well-established bilingual theories and researchers have evidenced the reciprocal language learning process that the knowledge of L1 assists L2 acquisition, and this L2 acquisition process facilitates subsequent L1 development (August, 2003; Cummins, 1989, McLaughlin, 1985; Snow, 1992; Vaughn et al., 2006).

# Conclusions



- ❖ The 70/30 model promoted bilingualism and biliteracy, indicating the effectiveness of this English intervention
- ❖ “A next major step for researchers is to produce the next generation of bilingual education researchers who will conduct program evaluation research, to refine what particular forms of DL programs are most effective” (Thomas & Collier, 2004, p. 18)
- ❖ The outcome of our study suggests the integration of following strands: phonemic awareness, letter-sound correspondence, word recognition and spelling, fluency and comprehension. The intervention supported students’ learning by incorporating structured and direct instruction, ESL strategies, context embedded vocabulary and activities engaging students’ learning to develop higher order thinking skills.
- ❖ Future research addressing the amount of oracy required to facilitate literacy and at what developmental periods would help educators make research-based decisions about the time allocation of two languages during instruction.



# Thank You !

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