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ABSTRACT

Two-way immersion (TWI) is an instructional approach that integrates native English speakers and native speakers of another language (usually Spanish) and provides instruction to both groups of students in both languages. While the model has been in existence in the United States for almost 40 years, the most dramatic growth has been seen over the past 15 years. Not surprisingly, the recent growth of two-way immersion education has prompted increasing interest in various aspects of such programs, such as design and implementation, student outcomes, instructional strategies, cross-cultural issues, and the attitudes and experiences of students, parents, and teachers involved. (Author)

CRESPAR

TRENDS IN TWO-WAY IMMERSION EDUCATION

A Review of the Research

Elizabeth R. Howard
Julie Sugarman
Donna Christian

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Center for Applied Linguistics

Report 63

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19. *Success for All/Éxito Para Todos: Effects on the Reading Achievement of Students Acquiring English*—R.E. Slavin, N.A. Madden
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24. *Review of Extended-Day and After-School Programs and Their Effectiveness*—O.S. Fashola
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27. *Expanding Knowledge of Parental Involvement in Secondary Education: Effects on High School Academic Success*—S. Catsambis
28. *Socio-Cultural and Within-School Factors That Effect the Quality of Implementation of School-Wide Programs*—R. Cooper
29. *How Students Invest Their Time Out of School: Effects on School Engagement, Perceptions of Life Chances, and Achievement*—W.J. Jordan, S.M. Nettles
30. *Disseminating Success for All: Lessons for Policy and Practice*—R.E. Slavin, N.A. Madden
31. *Small Learning Communities Meet School-to-Work: Whole-School Restructuring for Urban Comprehensive High Schools*—N.E. Legters
32. *Family Partnerships with High Schools: The Parents' Perspective*—M.G. Sanders, J.L. Epstein, L. Connors-Tadros
33. *Grade Retention: Prevalence, Timing, and Effects*—N. Karweit
34. *Preparing Educators for School-Family-Community Partnerships: Results of a National Survey of Colleges and Universities*—J.L. Epstein, M.G. Sanders, L.A. Clark
35. *How Schools Choose Externally Developed Reform Designs*—A. Datnow
36. *Roots & Wings: Effects of Whole-School Reform on Student Achievement*—R.E. Slavin, N.A. Madden
37. *Teacher Collaboration in a Restructuring Urban High School*—N.E. Legters
38. *The Child First Authority After-School Program: A Descriptive Evaluation*—O.S. Fashola
39. *MathWings: Effects on Student Mathematics Performance*—N.A. Madden, R.E. Slavin, K. Simons
40. *Core Knowledge Curriculum: Three-Year Analysis of Implementation and Effects in Five Schools*—B. McHugh, S. Stringfield
41. *Success for All/Roots & Wings: Summary of Research on Achievement Outcomes*—R.E. Slavin, N.A. Madden
42. *The Role of Cultural Factors in School Relevant Cognitive Functioning: Synthesis of Findings on Cultural Contexts, Cultural Orientations, and Individual Differences*—A.W. Boykin, C.T. Bailey
43. *The Role of Cultural Factors in School Relevant Cognitive Functioning: Description of Home Environmental Factors, Cultural Orientations, and Learning Preferences*—A.W. Boykin, C.T. Bailey
44. *Classroom Cultural Ecology: The Dynamics of Classroom Life in Schools Serving Low-Income African American Children*—C.M. Ellison, A.W. Boykin, D.P. Towns, A. Stokes
45. *An "Inside" Look at Success for All: A Qualitative Study of Implementation and Teaching and Learning*—A. Datnow, M. Castellano
46. *Lessons for Scaling Up: Evaluations of the Talent Development Middle School's Student Team Literature Program*—S.B. Plank, E. Young
47. *A Two-Way Bilingual Program: Promise, Practice, and Precautions*—M. Calderón, Argelia Carreón
48. *Four Models of School Improvement: Successes and Challenges in Reforming Low-Performing, High-Poverty Title I Schools*—G.D. Borman, L. Rachuba, A. Datnow, M. Alberg, M. Mac Iver, S. Stringfield, S. Ross
49. *National Evaluation of Core Knowledge Sequence Implementation: Final Report*—S. Stringfield, A. Datnow, G. Borman, L. Rachuba
50. *Core Knowledge Curriculum: Five-Year Analysis of Implementation and Effects in Five Maryland Schools*—M.A. Mac Iver, S. Stringfield, B. McHugh
51. *Effects of Success for All on TAAS Reading: A Texas Statewide Evaluation*—E.A. Hurley, A. Chamberlain, R.E. Slavin, N.A. Madden
52. *Academic Success Among Poor and Minority Students: An Analysis of Competing Models of School Effects*—G.D. Borman, L.T. Rachuba
53. *The Long-Term Effects and Cost-Effectiveness of Success for All*—G.D. Borman, G.M. Hewes
54. *Neighborhood and School Influences on the Family Life and Mathematics Performance of Eighth-Grade Students*—S. Catsambis, A.A. Beveridge
55. *The Public School Superintendency in the 21st Century: The Quest to Define Effective Leadership*—J.Y. Thomas
56. *Local School Boards Under Review: Their Role and Effectiveness in Relation to Students' Academic Achievement*—D. Land
57. *Program Development in the National Network of Partnership Schools: A Comparison of Elementary, Middle, and High Schools*—M.G. Sanders, B.S. Simon
58. *Developing Transitional Programs for English Language Learners: Contextual Factors and Effective Programming*—D. August
59. *Comprehensive School Reform and Student Achievement: A Meta-Analysis*—G.D. Borman, G.M. Hewes, L.T. Overman, S.Brown
60. *Cultural Issues Related to High School Reform: Deciphering the Case of Black Males*—W.J. Jordan, R. Cooper
61. *Supporting the Development of English Literacy in English Language Learners: Key Issues and Promising Practices*—D. August
62. *The Baltimore Curriculum Project: Final Report of the Four-Year Evaluation Study*—M. Mac Iver, E. Kemper, S. Stringfield
63. *Trends in Two-Way Immersion Education: A Review of the Research*—E.R. Howard, J. Sugarman, D. Christian
64. *From National Movement to Local Action: The Status of Standards-based Science Instruction in Middle School Classrooms*—C.B. Swanson, S.B. Plank, G.M. Hewes
65. *Bringing the District Back In: The Role of the Central Office in Improving Instruction and Student Achievement*—M.A. Mac Iver, E. Farley

THE CENTER

Every child has the capacity to succeed in school and in life. Yet far too many children fail to meet their potential. Many students, especially those from poor and minority families, are placed at risk by school practices that sort some students into high-quality programs and other students into low-quality education. CRESPAR believes that schools must replace the "sorting paradigm" with a "talent development" model that sets high expectations for all students, and ensures that all students receive a rich and demanding curriculum with appropriate assistance and support.

The mission of the Center for Research on the Education of Students Placed At Risk (CRESPAR) is to conduct the research, development, evaluation, and dissemination needed to transform schooling for students placed at risk. The work of the Center is guided by three central themes—ensuring the success of all students at key development points, building on students' personal and cultural assets, and scaling up effective programs—and conducted through research and development programs in the areas of early and elementary studies; middle and high school studies; school, family, and community partnerships; and systemic supports for school reform, as well as a program of institutional activities.

CRESPAR is organized as a partnership of Johns Hopkins University and Howard University, and is one of 12 national research and development centers supported by a grant (R117-D40005) from the Institute of Education Sciences (IES, formerly OERI) at the U.S. Department of Education. The centers examine a wide range of specific topics in education including early childhood development and education, student learning and achievement, cultural and linguistic diversity, English language learners, reading and literacy, gifted and talented students, improving low achieving schools, innovation in school reform, and state and local education policy. The overall objective of these centers is to conduct education research that will inform policy makers and practitioners about educational practices and outcomes that contribute to successful school performance.

ABSTRACT

Two-way immersion (TWI) is an instructional approach that integrates native English speakers and native speakers of another language (usually Spanish) and provides instruction to both groups of students in both languages. While the model has been in existence in the United States for almost 40 years, the most dramatic growth has been seen over the past 15 years. Not surprisingly, the recent growth of two-way immersion education has prompted increasing interest in various aspects of such programs, such as design and implementation, student outcomes, instructional strategies, cross-cultural issues, and the attitudes and experiences of students, parents, and teachers involved. Along with the increase in number of TWI programs, the research base on this educational approach is growing steadily. The purpose of this report is to summarize the research that has been conducted to date, synthesize the key findings across studies, and point to areas of need for future research.

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TABLE OF CONTENTS

INTRODUCTION

Two-way immersion (TWI) is an instructional approach that integrates native English speakers and native speakers of another language (usually Spanish) and provides instruction to both groups of students in both languages. The first two-way immersion education programs in the United States started almost 40 years ago, with programs such as Ecole Bilingue, a French/English program in Massachusetts, and Coral Way, a Spanish/English program in Florida. However, while the program model has been in existence in this country for quite some time, the growth in popularity of the model is a more recent phenomenon. For the first 20 years, the number of new programs remained relatively low, with 30 programs documented in the mid-1980s (Lindholm, 1987). Since then, the number of programs has increased dramatically, with 266 documented programs in 2002 (Center for Applied Linguistics, 2002). The majority of these programs are public Spanish/English programs at the elementary level.

Two-way immersion is an educational alternative that has the potential to expand even further given the current demographics and societal needs in the United States. The population of language minority students (students whose first language is a language other than English) continues to grow rapidly, with the population of native Spanish speakers continuing to be the largest presence (National Clearinghouse for English Language Acquisition [NCELA], 2002). At the same time, the drop-out rate for Hispanic students is extremely high, suggesting that current educational efforts are not meeting the needs of these students and that alternative educational approaches that will better serve them need to be developed and/or implemented on a larger scale (National Center for Education Statistics [NCES], 2002). For native English speakers, the United States has traditionally had a weak foreign language education system, typically producing students with some familiarity with other languages and cultures, but with limited ability to speak, read, or write in a second language. TWI programs provide native English speakers with the opportunity to develop high levels of oral and written language competence in their second language. For all students, given the evidence of an increasingly global economy, bilingualism, biliteracy, and cross-cultural awareness are three key assets for an individual and for society as a whole. Because TWI programs strive to develop these abilities in all students, in addition to helping them attain grade-level academic achievement, they are timely educational models that will help participating students meet the demands of the society they inherit.

Not surprisingly, the recent growth of two-way immersion education has prompted increasing interest in various aspects of such programs, such as design and implementation, student outcomes, instructional strategies, cross-cultural issues, and the attitudes and experiences of students, parents, and teachers involved. Along with the increase in number of TWI programs, the research base on this educational approach is growing steadily. The purpose of this report is to summarize the research that has been conducted, synthesize the key findings across studies, and point to areas of need for future research.

As is the case in educational research in other areas, there are a number of methodological challenges associated with research on two-way immersion that make it difficult to pinpoint definitive findings. One general concern about educational research that focuses on program comparisons is the issue of non-random assignment, which can affect the interpretation of findings. Because two-way immersion programs are voluntary, self-selection may influence

student outcomes. In other words, if students in TWI programs are found to do better than their peers in other programs, it is difficult to know if this is because of the effects of the TWI program itself, or due at least in part to inherent differences among the student populations and their families. And this is assuming that it is even possible to have a comparison group of students in an alternative program within the school or within the district. In many districts, there is a clustering effect where a single model is clearly the dominant choice for certain groups of students, making program comparisons difficult. For example, all of the native Spanish speakers (with the exception of the few whose parents choose another program) might be placed in TWI, while all of the language minority students from other language backgrounds would be grouped in ESL classes, thus making any comparisons of the performance of native Spanish speakers in TWI vs. other programs impossible. Finally, there is frequently a real socioeconomic difference between the language minority students and native English speakers who participate in TWI programs. The language minority students are more likely to come from homes where there is poverty and where parents have limited formal schooling, and the native English speakers are more likely to come from homes that are solidly middle class and where parents have substantial formal education. This difference in the backgrounds of the two groups of students makes internal comparisons of student performance difficult, as the students frequently differ by more than just native language.

All of these issues point to a need to conduct research in a way that deals with these methodological concerns and seeks clarity as much as possible. As was stated in the report *Improving schooling for language minority children: A research agenda* (August & Hakuta, 1997), there is a need to move away from global program comparisons and towards a research paradigm that looks more closely at features within a program model that impact student achievement, such as literacy instructional practices or grouping strategies. These types of within-program issues could be looked at experimentally, as students within programs could be randomly assigned to different educational 'treatments.' In addition, given that bilingualism, biliteracy, and cross-cultural awareness are three specific goals of TWI programs, there is a need to employ longitudinal designs that will enable researchers to map the developmental trajectories of TWI students in these areas. Finally, ethnographic research and other methods such as discourse analysis can provide valuable insights about a number of issues in two-way immersion education, such as student self-grouping patterns, teachers' perceptions about instructional strategies in two-way immersion programs, and teachers' and students' language use. In summary, employing a variety of research strategies in appropriate ways is likely to yield the most fruitful information to help the field move forward.

The research base for this report was the online two-way immersion bibliography developed and maintained by the Center for Applied Linguistics (http://www.cal.org/twi/bib.htm). This bibliography was generated through research archives maintained by the Center for Applied Linguistics (CAL) and supplemented by searches of ERIC, PsycINFO, and UMI Dissertation Abstracts. Because the research base in this field is fairly new, an expansive approach was taken that included articles in peer-reviewed journals, research and practitioner reports generated by research centers, books, dissertations, and publicly available conference papers. Although they do provide data on academic achievement and biliteracy, program evaluations to satisfy federal grant requirements were not included in this review both because they are so numerous and because the majority are not readily available. While great breadth was allowed in terms of dissemination

format, there was clear focus with regard to topic. Only research that relates directly to two-way immersion education in the United States was reviewed for this report. Although various terminology was used in the research included in this report (e.g. referring to two-way immersion programs as dual-language programs or to language minority students as English Language Learners), the terms and abbreviations used most frequently by the authors of this report have been used throughout the report for clarity and consistency.

As mentioned above, the 113 references on two-way immersion cited in this report were culled from a variety of sources: 36 journal articles, 34 doctoral dissertations, 14 reports, 10 conference papers, 5 books, 5 book chapters, and a number of other sources such as ERIC Digests and ERIC documents. The research studies present findings from both new and established programs all over the U.S., with California, Massachusetts, and Texas being the most frequently represented states. The majority of studies are small-scale studies conducted with elementary school-age students in Spanish programs.

The report is divided into the following topic areas: general information, implementation, program profiles, academic achievement, language and literacy outcomes, cultural context and social impact, integration of language minority and language majority students, language status, student attitudes, teachers' experiences and professional development, and parent attitudes and involvement. With the exception of the section on general information, each section includes an introduction, a brief summary of each relevant study, and a conclusion that synthesizes findings across studies and points to general methodological issues and existing gaps in the research. The report concludes with an overview of the current state of knowledge about two-way immersion education and suggestions for future areas of research.

GENERAL INFORMATION

Definition and Goals

The definition and goals of two-way immersion education have been clearly articulated in the literature (Christian, 1994, 1996a; Christian, Howard, & Loeb, 2000; Genesee, 1999; Howard & Christian, 2002; Lindholm-Leary, 2000, 2001). Two-way immersion is an educational approach that integrates language minority and language majority students for all or most of the day, and provides content instruction and literacy instruction to all students in both languages. Stating this another way, there are three defining criteria of TWI programs. First, the programs must include fairly equal numbers of two groups of students: language minority students, who in the United States are native speakers of a language other than English, such as Spanish, Korean, Chinese, etc; and language majority students, who in the United States are native English speakers. Second, the programs are integrated, meaning that the language minority students and language majority students are grouped together for core academic instruction (i.e., content courses and literacy courses) for all or most of the day. Finally, TWI programs provide core academic instruction to both groups of students in both languages. Depending on the program model, initial literacy instruction may not be provided to both groups in both languages, but by about third grade, regardless of program model, all students are generally receiving literacy instruction in both languages. Following from this definition, there are four central goals of all TWI programs:

1. Students will develop high levels of proficiency in their first language (L1). This means that the language minority students will develop high levels of speaking, listening, reading, and writing ability in their native language (e.g., Spanish) and native English speakers will develop high levels of speaking, listening, reading, and writing ability in English;
2. All students will develop high levels of proficiency in a second language (L2). TWI programs are considered additive bilingual programs for both groups of students because they afford all students the opportunity to maintain and develop oral and written skills in their first language while simultaneously acquiring oral and written skills in a second language;
3. Academic performance for both groups of students will be at or above grade level, and the same academic standards and curriculum for other students in the district will also be maintained for students in TWI programs; and
4. All students in TWI programs will demonstrate positive cross-cultural attitudes and behaviors.

A Recent Overview of TWI Programs in the United States

A report by Howard and Sugarman (2001) provided a summary of program-level and demographic information for the 248 TWI programs in the 2000 *Online Directory of Two-Way Bilingual Immersion Programs in the United States* maintained by the Center for Applied Linguistics (http://www.cal.org/twi/directory/). The majority of the programs were in public schools, operated as strands within schools, served the elementary grades, and provided instruction in Spanish and English. Fifteen of the 248 programs provided instruction in Chinese, French, Korean, or Navajo.

While there was significant variation across schools, three basic program models were identified at the elementary level. Some programs provided most instruction (80-90%) in the minority language in the early grades, increasing the amount of English at each higher grade level until the use of the two languages was about equal (usually by fourth grade). These programs, often referred to as "90/10" or "minority language dominant," comprised 42% of the programs in the 2000 directory. Another basic model involves equal amounts of instruction in the two languages from the beginning of the program. Called the "50/50" or "balanced" model, it represented 33% of the programs in the directory. Finally, a small percentage of programs (2%) were "differentiated," in that they provided differing ratios of instruction in the two languages for English-speaking and language minority students. The directory also included secondary programs (13% of the schools listed), and 9% of the schools did not supply information about program model.

With regard to initial literacy instruction, 31% of the programs reported that they provided initial literacy instruction through the minority language to all students, 22% used both languages simultaneously, 20% separated the students by native language, 1% provided initial literacy instruction solely in English to all students, 14% did not serve primary grades, and 12% were unreported. Regarding staffing, 54% of programs reported that 100% of teachers were proficient in both languages, and 29% of programs reported that 100% of staff members were proficient in both languages.

The survey also reported demographic trends. In terms of racial/ethnic diversity, 54% of programs had no clear racial/ethnic majority of native English speakers (NES), 17% had mostly (75% or more) White NES, 13% had mostly Latino NES, 2% had mostly African American NES, 1% had mostly Asian NES, 1% had mostly Native American NES, and 12% did not respond. With regard to socioeconomic status (SES), in 32% of the programs, more than half of both native English speakers and language minority students were eligible for free/reduced lunch. Overall, however, there were more low-income language minority students than language majority students in the TWI programs included in the analyses.

IMPLEMENTATION OF TWO-WAY IMMERSION PROGRAMS

Key Issues

A number of sources have highlighted the key issues involved in effective implementation of elementary TWI programs, including student population, program design, school environment, staffing, and instructional strategies (Calderón & Minaya-Rowe, 2003; Christian, 1994, 1996a; Christian, Howard, & Loeb, 2000; Howard & Christian, 2002; Howard, Olague, & Rogers, 2003; Lindholm, 1990; Lindholm-Leary, 2000, 2001).

The student population of TWI programs needs to include both native English speakers and native speakers of a single minority language. The two groups of students should be fairly well balanced, with each making up approximately half of the student population at each grade, and with neither group falling below one-third of the total at any grade level.

As mentioned in the last section, there are two main program designs in TWI: 1) 90/10 (or a common variation, 80/20), in which most instruction in the primary grades is provided in the minority language, with a gradual increase in English instruction through third or fourth grade, when a 50/50 balance is reached; and 2) 50/50, in which instruction at all grade levels is divided equally across the two languages. Regardless of the model chosen, the program should continue for at least the full span of the elementary grades (K-5).

The school environment should maintain high academic expectations for all students, encourage parental involvement, and demonstrate clear support for bilingualism and multiculturalism. Staffing in TWI programs is very important, in particular the need to have certified teachers who have additional certifications in bilingual and/or ESL instruction and are familiar with issues of second language learning and bilingualism.

Finally, instructional strategies that promote language development, interaction, and mastery of academic concepts should be employed, such as cooperative learning, hands-on activities, thematic units, separation of languages, and sheltered instruction.

Two articles by Peregoy (1991) and Peregoy and Boyle (1999) looked at the issue of instructional strategies as they relate to teaching native English speakers in a Spanish dominant kindergarten class. To ensure the academic and social success of native English-speaking students,

the teachers used multiple "environmental scaffolds" in both teacher-directed instruction and child-initiated play and interactions. Environmental scaffolds at the classroom level included: adherence to daily routines and schedules; the daily repetition of routine phrases, songs, and poems; daily activities such as changing the date on the calendar (i.e., repetition of vocabulary); the teacher's use of gestures, pictures, and toys to reinforce new vocabulary; and modeling of verbal responses by native Spanish-speaking students.

Many studies on two-way immersion include research- and experience-based suggestions for implementing new two-way immersion programs. Overall, these suggestions stress planning, flexibility, and communication. Two of the most comprehensive research-based sources for such implementation suggestions are the *Dual-language Instruction: A Handbook for Enriched Education* (Cloud, Genesee, & Hamayan, 2000) and *Designing and Implementing Two-way Bilingual Programs: A Step-by-step Guide for Administrators, Teachers, and Parents* (Calderón & Minaya-Rowe, 2003). Aside from elaborating on the realization of the above critical features of TWI, the authors of each book also discuss issues related to communicating with parents, planning the growth of the program, and adapting curriculum and assessment to the two-way classroom.

Beyond the standard requirements for dual-language programs, Mora, Wink, and Wink (2001) argue that especially for bilingual programs where there is so much contested terminology and so many differing ideologies of implementation, the degree of congruence between ideology and implementation is as crucial to the success of the program as the features of the program itself. They name three necessary characteristics of effective TWI programs: 1) a pedagogically-sound model of instruction that fits the demographic realities and resources of the school community; 2) fidelity to the model in all aspects of implementation; and 3) a timely and appropriate means of addressing any incongruity between the model, school/community needs, and systems of implementation. The authors use the interrelationship of three factors to establish congruence between a theoretical model and classroom practice—the model, teacher beliefs, and classroom language use—in evaluating program quality.

Case Studies of Program Implementation

As an illustration of what can happen when the congruence recommended by Mora, Wink, and Wink does not exist at a given school, Ramos-Pell (1996) described a seven-year-old 50/50 program in upstate New York, where there was an incongruence and breakdown in communication between the administration and the teachers over the critical features of the program. Her investigation revealed that various groups of stakeholders had different motivations for advocating the same program, causing deterioration of their initial unity and a breakdown of communication. The school initially housed separate transitional bilingual and foreign language immersion programs for native Spanish speakers (NSS) and native English speakers (NES), respectively. At the time of the transition to a TWI program, the administrators were most concerned with racial integration of the diverse, inner-city school, while teachers and other community leaders were committed to the goals of TWI as laid out by Lindholm (1987, 1990). As the administrators' goals were achieved within the first year of implementation, the careful attention to planning and

implementing the program that was evident in the initial stages was lost, leaving new teachers in the program without professional development and creating a power imbalance between the new teachers and the veteran teachers. These and other concerns were not addressed by the staff because of communication problems that developed during implementation.

In contrast, Treadway (2000) attributed the successful implementation of a 50/50 program in New Mexico to the congruence of community support, administrative vision, teacher flexibility, and curricular innovation. The program benefited from support from parents and other community members, as well as the flexibility of state and local standards and assessment procedures. Teachers used culturally-integrative, child-centered approaches in the classroom, and those who followed the principal's vision and were fully understanding of the individual, home, and community resources of the students were best able to adapt their teaching to the new TWI program. Those teachers who did not attend planning or training sessions did not display the attributes of successful TWI programs in their classrooms, thus the author suggested that professional development for all teachers in the school be mandatory and ongoing.

Wiese (2001) studied the nested contexts of implementation (including national/state educational goals, official school policy, informal school-wide agreements, and teachers' instruction) in an ethnically diverse Spanish/English TWI program in the San Francisco Bay area. Considering school policy in theory and in practice, Wiese discovered that the "official" position as a TWI program offering biliteracy to all students was undermined by administrators and teachers who had different expectations for NSS and NES students. In implementing this program, the staff's initial frame of reference focused on student selection and on expectations for each group of students, who were often delineated on racial/ethnic lines. Staff eventually refocused their efforts on creating a dynamic curriculum based on the needs of the diverse population. Teachers negotiated their day-to-day instruction in the context of the program's evolving definition and goals, and had an extra challenge in implementing the biliteracy program as individual students were given initial literacy instruction in either English or Spanish, depending on teacher evaluations.

Leoni-Bacchus' case study (2002) provides another example of how the implementation and continued development of a program relies on teachers' reflections on their experiences in the classroom. A kindergarten teacher in New York City implemented the goals of second language learning and academic achievement by fostering communicative competence and opportunities for interaction for her students in the Spanish half of the day, using what is described as a fluid and intuitive style of planning, teaching, and assessing. She discovered that even in this established, successful program, she and her fellow Spanish teachers needed to develop a more formal planning and assessment process, especially to support and monitor Spanish language development.

Lewis (2000) interviewed parent, teacher, and administrator stakeholders in a Texas 50/50 TWI program beginning with its implementation phase. Her interviews resulted in five categories of implementation phenomena: parental interest and motivation, broad-based (community) support and leadership for implementation, academic concerns, instructional delivery, and socialization concerns. Both parents and administrators saw parental involvement as not only beneficial to implementation, but also "the catapulting force that drove the instructional pace, programmatic

focus, and positive energy for learning" (p. 81) in the school. Barriers to ongoing implementation of the program included sustaining parental involvement, the quality of teachers, and the complexity of second language learning. Teachers noted concerns in the implementation phase related to the overwhelming level of parental involvement in the classroom, and the teachers' inexperience with immersion programs.

Implementation at the Secondary Level

Only one study to date has focused specifically on implementation at the secondary level (Montone & Loeb, 2000). This report was based on phone interviews with administrators in seven secondary TWI programs. According to the respondents, issues that have to be taken into consideration at the secondary level include program planning, staffing, transportation (especially if many elementary TWI programs feed into a central secondary program), and parent involvement.

In the area of program planning, there are multiple concerns. The first has to do with language distribution, curriculum, and materials. At the secondary level, TWI programs generally consist of one or two classes taught in the minority language, usually language arts and one content area. That content area frequently depends on the availability of both pedagogical materials in the minority language and a teacher with the given content certification and bilingual capabilities.

A second issue related to program planning is student participation and motivation. Secondary programs have a need to motivate adolescents in contrast to elementary programs that primarily have to recruit/motivate parents. In contrast to elementary programs, which primarily have to recruit and motivate parents, secondary programs need to motivate the students themselves to participate. This can be difficult, as secondary TWI programs face challenges from many other adolescent interests, such as electives, sports, and being with other (non-TWI) peers.

A third issue is that of attrition and late entries. Respondents stated that it is important to minimize attrition because of the difficulty of allowing late entries unless they transfer from another immersion program.

Finally, student scheduling is much more complicated at the secondary level, in part because of teams, clusters, and houses and the need to weigh the benefits of maintaining a cohesive all-TWI strand vs. allowing for integration with other non-TWI students and teachers. Overall, the reported benefits of secondary TWI education include the same benefits of elementary TWI, with the added benefits of continued development of second language skills and preparation for advanced language classes, International Baccalaureate programs, and courses leading to Advanced Placement credit.

Conclusion

A number of important commonalities about program implementation can be seen in the research and recommendations reviewed in this section:

1. It is important to have all stakeholders involved in program planning from the earliest stages in order to ensure that everyone understands the model, has a shared vision for implementation, and is clear about others' motivations for starting the program.
2. It is necessary to develop a long-term plan that will serve as a guide for implementation throughout the full elementary sequence of the program and possibly beyond. Simply planning for the first year of implementation without looking beyond to the full articulation of the program can lead to a breakdown of the program.
3. The ongoing involvement of parents in planning and implementing the program is crucial; programs may want to consider hiring a parent outreach coordinator to ensure that this occurs.
4. The support and understanding of administrators at the school and district level are critical for program success.
5. The recruitment and retention of high quality instructional staff and the ongoing professional development of these individuals are central to the success of a TWI program.
6. The school environment should be welcoming and supportive, and should promote equity by having the same academic goals for the two groups of students and working to equalize the status of the two languages and the two language groups of students.

As is clear from the case studies in this section, the issues that must be faced during planning and implementation can be quite daunting. It is easy for practice to fall short of the ideal.

PROGRAM PROFILES

Profiles of eight TWI programs are included in this section. Research reviewed in other sections (such as academic achievement) also includes profiles of the programs involved in that research (such as Amigos in Cambridge, Massachusetts), but in those cases, the profile itself is not the focus of the research. In general, program profiles provide case studies of successful TWI programs and tend to reinforce the effective features for program implementation highlighted in the previous section. Throughout this section, all of the programs are described in the past tense because changes may have occurred since the time of publication of the profiles.

A study by Smith and Arnot-Hopffer (1998) provides an overview of Tucson's Davis Bilingual Magnet School and its program for promoting balanced Spanish literacy, Exito Bilingüe. The whole-school TWI program was originally implemented as a 50/50 program, but developed into a Spanish-dominant program after finding that its native English students lagged considerably behind native Spanish speakers in biliteracy development. The modified model began with all instruction in Spanish in the primary grades (100/0), with a gradual increase in the amount of English instruction until the ratio of Spanish to English instructional time reached 70/30 in the upper grades. Even with the increase in the amount of instruction in Spanish, fifth grade scores on *Stanford 9* English language arts and English reading assessments for the school were above both district and national averages. With a new district focus on balanced literacy, Davis implemented "Exito Bilingüe," a multi-age/flexible grouping literacy program in Spanish. Preliminary results suggested that all Davis students improved their Spanish literacy skills. The authors also found evidence of transfer of skills across languages, given that this Spanish literacy

approach yielded favorable performance on English district writing assessments and *Stanford 9* English reading and language arts scores. Ongoing teacher reflection sessions were an important component of the program, as they provided teachers with sustained professional development and the opportunity to discuss the implementation. In a related study, Smith et al. (2002) added that teachers in this program had autonomy to tailor their classes to their students' needs, and that the stakeholders were very committed to the long-term goal of biliteracy development. Through their writing, students showed awareness of language and status issues, and demonstrated academic achievement in two languages.

Calderón and Slavin (2001) provided a profile of Hueco Elementary, a 50/50 Success for All (SFA)/Exito Para Todos (EPT) TWI program in El Paso, Texas. The program's students were 100% Latino, with one third English dominant, one third Spanish dominant, and one third bilingual students; in addition, the majority were low income. SFA/EPT is a literacy program for grades K-5 that calls for 90 minutes of instructional time per day and the assessment of student progress at eight-week intervals. The pre-k/kindergarten reading program was called *Early Learning/Aprendizaje Inicial.* Its components included Storytelling and Retelling (pre-reading skills such as concepts about print, phonemic awareness, alphabet familiarity, and listening comprehension), Shared Book (the use of big books to foster more pre-reading skills), Peabody Language Development Kit (vocabulary and cognitive development), Letter Investigation (letter knowledge), Rhyme with Reason (phonemic awareness), and Kinder Roots (formal reading). The first grade program, called *Reading Roots/Lee Conmigo*, involved 20 minutes of listening comprehension followed by shared reading to build on literacy skills such as sound/letter association, letter blending into words, comprehension, and fluency. The program for grades 2-5 was *Reading Wings/Alas para Leer.* Based around existing reading materials, it was designed to promote greater fluency, comprehension, reading strategies, and written fluency through listening comprehension and joint reading activities. At all grade levels, all of these activities were done alternately in English and Spanish. In the early grades, alternation occurred daily, followed by half-week rotations, and finally, weekly rotations in the upper grades. Students received simultaneous literacy instruction in both languages at all grade levels. The program also included individual tutoring for students who experience difficulty, a full-time facilitator who helped with implementation, family support, professional development for teachers (three days pre-service and then three sessions during the year), and ongoing teachers' learning communities.

Armendáriz and Armendáriz (2002) profiled a seven-year-old 90/10 magnet school program in Albuquerque, characterized by a high percentage of students (50%) entering the program with some degree of bilingualism. The program began as a cooperative effort between teachers, parents, and administrators. At the beginning, concerns focused on some parents' devaluation of bilingualism, finding qualified bilingual staff, and convincing the community that the program was sound. An administrator cautioned that programs should not rely on "special funding," but should work within their operational budget as much as possible (this school used its "special funding" for staff training and additional materials in Spanish). District support for professional development and credentialing improved the quality of the staff. Successes included raising test scores in English and Spanish, increasing participation in gifted and talented programs, increasing the number of certified bilingual teachers, and receiving a positive response from the community.

Profiles in Two-Way Immersion Education (Christian, Montone, Lindholm, & Carranza, 1997) looked at three schools (Key, River Glen, and Inter-American). Across the programs, there were generally positive results for all students in terms of oral language proficiency, literacy, and content area mastery. All three schools also demonstrated effective features of TWI programs—strong leadership, high quality teachers with ongoing professional development, involved parents, and sound instructional practices (e.g., cooperative learning, separation of languages, and content/language integration).

The Francis Scott Key Elementary School in Arlington, Virginia started its TWI program in 1986 with a first grade class, and added a successive grade each year. Kindergarten was added in 1991. The district's program was extended to high school, and two additional elementary TWI programs were implemented in the county in 1992. Key operated on a 50/50 model, with language of instruction allocated by teacher and content area. Most of the population was Latino or White, with smaller numbers of African American and Asian students. About a third of the students were eligible for free/reduced lunch. The program began as one for gifted and talented students, but then was opened to all students.

The River Glen TWI program started as a magnet school in 1986 as part of a desegregation effort in the San Jose Unified School District in California. It was helped by the California Department of Education's Office of Bilingual Education, which had conceptualized 90/10 TWI instruction, implemented it successfully in San Diego, and was interested in expanding. River Glen started with kindergarten and first grade and received a Title VII grant to help with growth beyond K-1, expanding up to eighth grade.

The Inter-American Magnet School (IAMS) in Chicago was started as a 50/50 program by two parent/teachers who wanted their children to experience bilingualism. They began a grassroots effort to start a bilingual preschool, and with help from other parents and teachers, were able to push the program forward one grade level at a time, up to sixth grade (and ultimately, eighth grade). IAMS became a public magnet school with an 80/20 TWI program. Its students were accepted by lottery based on racial/ethnic categories (to achieve the required diversity) and gender. Siblings of current students were accepted pre-lottery.

In addition to the Christian et al. review, IAMS has been profiled by several other authors, most recently by Urow and Sontag (2001). According to their article, the student population was 65% Latino, 19% White, and 14% African American. An issue of concern for the program's linguistic balance was the increasing percentage of Latinos entering as English dominant. Twelve percent of the students required special education services. Initial literacy instruction was provided to students in their native language from pre-K through first grade. From second grade on, all students received formal language arts in both languages, in integrated settings. Instructional strategies such as separation of languages, discovery learning, and cooperative learning were central to the program. There was strong parent involvement and an extensive student teacher/mentoring arrangement with Chicago State University.

Another frequently cited school in TWI research is the Oyster School in Washington, D.C., which is one of the oldest TWI programs in the country. Fern (1995) wrote that 40% of the students in the majority-Latino school qualified for free/reduced lunch, although the school was in a high-income neighborhood. Each class was team-taught by an English teacher and a Spanish

teacher, and all language and content were taught 50% in English and 50% in Spanish according to schedules determined by the individual teachers. Instructional strategies included writing workshops and the "whole language" approach to literacy.

The Alicia Chacón International School in El Paso, Texas was featured in two recent profiles (Calderón & Minaya-Rowe, 2003; Howard, 2002). This K-8, whole-school TWI program not only provided instruction through English and Spanish, but also included a third language component, whereby all students received instruction through German, Japanese, Chinese, or Russian for 10% of the school day at all grade levels. Many of the components of effective TWI programs were in place, such as strong leadership at the school and district level, qualified staff, parental involvement and satisfaction, a balance of native English speakers and native Spanish speakers, a clear mission, and appropriate curricular and instructional practices. The program was highly successful in meeting the goals of two-way immersion, as the students performed at high levels academically, and also succeeded in becoming bilingual and biliterate, with proficiency in a third language as well. According to Howard, fifth grade performance on the Texas Assessment of Academic Skills (TAAS) in Spring 2000 was very high, with 95% of Alicia Chacón students meeting the minimum expectation for all tests taken. The fifth graders likewise showed very high mean performance in oral language and literacy development in English and Spanish based on assessments administered as part of the two-way immersion study conducted by the Center for Research on Education, Diversity & Excellence (CREDE).

Conclusion

In general, these profiles of successful programs provide real-life examples of putting the theoretical ideals of two-way immersion education into practice. Specifically, these programs are similar in that they all have effective features such as a clear vision, supportive administration, parental involvement, high quality staff and ongoing professional development, and a positive school environment. In addition, the stakeholders associated with these programs demonstrate ongoing reflection and adaptability, allowing the programs to expand and change over time to meet the shifting needs of the student populations. While these programs have these central features in common, they vary in terms of program model, student population, approach to literacy instruction, location, and length of time in operation. In this way, they stand together as an indicator that the TWI model is feasible in a number of situations with varying local conditions.

ACADEMIC ACHIEVEMENT

The academic achievement of students in TWI programs has been a central concern of educators, parents, and policymakers, and as a result, much of the research on two-way immersion has focused on the academic outcomes of students. There have been three longitudinal, large-scale, comparative studies (Lindholm-Leary, 2001; Thomas & Collier, 1997, 2002). The remaining studies have involved relatively small numbers of students in one or two schools in a single location. While these smaller studies lack the generalizability of larger studies, their strength is that

they are able to contextualize the students' performance in terms of the school environment and the community where the school is located.

The majority of TWI studies that deal with student outcomes rely on standardized measures of oral language, literacy, and academic performance in the content areas. Standardized test scores are usually needed to demonstrate program effectiveness from a policy perspective. At the school level, researchers suggest that there are other important considerations when monitoring the success of the students and the program. According to Cloud, Genesee, and Hamayan (2000), teachers must distinguish between testing students' knowledge of content and their proficiency in a language, and must also take care that their assessment procedures are culturally and developmentally appropriate for the TWI population. Assessment must also monitor students' sociocultural competence and appropriate use of academic and social registers of the target language, and involve students actively in the assessment process.

Large-Scale Studies

Thomas and Collier (1997) analyzed 700,000 student records to track the long-term educational outcomes of English language learners in five school districts. These elementary students experienced various program types: ESL pullout (traditional), ESL content (including content curriculum and English language arts), transitional bilingual education, one-way developmental bilingual education, and two-way developmental bilingual education. In "one-way" developmental bilingual education, most or all of the students are language minority; "two-way" developmental bilingual education is the same as two-way immersion, in that students from two language backgrounds are integrated for instruction. Choosing programs that were well implemented, they aimed to describe a 'best-case' scenario regarding the effectiveness of each program type. They found a significant program effect that was apparent by late high school. Only those groups that received strong, grade-level cognitive and academic support in both their first and second languages for many years were found to be succeeding at the end of high school. Formal schooling in the first language was the largest single predictor of long-term success. Length of time in the program was also found to be crucial: four to seven years were required for language minority students to close the gap between their test scores and those of their NES peers. Current teaching approaches, such as language/academic-content integration, were significant, as was sociocultural support for language minority students. TWI was found to be the program type with the highest long-term success, with students achieving well above grade level. One-way developmental bilingual education also showed above-grade-level success. Language minority students in other types of programs were unable to close the gap with NES by the end of high school.

In a later report, Thomas and Collier (2002) presented findings from their 1996-2001 continuation study. The authors found that only 90/10 and 50/50 one-way and two-way developmental bilingual programs enabled language minority students to reach the 50th percentile on standardized tests on all subjects in both languages and to maintain or surpass that level of achievement. They also found that the fewest dropouts came from these programs. In contrast, the achievement gap between language minority students in segregated, remedial programs and their peers was found to widen after language minority students re-entered mainstream classes, with even the highest quality ESL content programs narrowing the gap only about half-way. Bilingually

schooled students were found to outperform their peers who were educated monolingually in English in all subjects after 4-7 years.

In another large-scale study (Lindholm-Leary, 2001), results indicated that NSS and NES in Spanish/English TWI programs performed at or above grade level in the content areas in their first language, achieving standardized mathematics and reading test scores on par with their peers statewide. In addition, both groups of students demonstrated high levels of academic achievement through their respective second languages. In both cases, results varied somewhat according to language background, student characteristics, and program type. Socioeconomic status (SES) was a significant factor in math achievement in both the first and second languages, with mid-SES students outperforming low-SES students by fifth grade. Strong, significant correlations were found in math ability across the two languages, suggesting that content learned in one language is transferred to the other language. Socioeconomic status was also significantly associated with second-language reading performance for both NSS and NES, with mid-SES students outperforming low-SES students. In first language reading, there was an interaction between native language and socioeconomic status, such that the gap between mid-SES and low-SES students was larger for NES than NSS. Lindholm-Leary hypothesized that this might have been due to greater actual variability in SES among NES than among NSS. In addition, higher levels of bilingual proficiency in English and Spanish were associated with higher levels of literacy in the two languages for both groups of students.

Small-Scale Studies

Academic Achievement in the Primary Grades

Ajuria (1994) compared the academic achievement of first grade students in a TWI school with their peers in an English-only (mainstream) school in the Northeast. Overall, students in the TWI program scored higher in English and math in both fall and spring. Perhaps reflecting these demographic differences across programs, Ajuria found that in English, NES in both TWI and mainstream classes scored higher on average than their NSS peers, but the difference was only significant for the TWI NES. Additionally, while all students, on average, showed an increase in English performance from fall to spring, this increase was not significant. In Spanish, NSS within the TWI program significantly outscored NES on Spanish language arts tests, and both groups showed significant improvement over time.

Castillo (2001) compared the academic achievement of K-2 students in a predominately Hispanic, low SES, Texas TWI program (n=67 NSS and 29 NES) with 49 NES and 4 NSS controls in a non-TWI[1] program. Looking at scores from the *Iowa Test of Basic Skills* (*ITBS*) for English reading, language and math, the author found that NES in the TWI program scored significantly above the non-TWI NES students on language and math. TWI NSS scored significantly higher than non-TWI NSS students in reading and math. Within the TWI program,

[1] The non-TWI program's type is unspecified but is presumably mainstream/English-only.

NES scored significantly higher than NSS on the Spanish reading, language, and math subtests of the *Aprenda* standardized test. On the *ITBS*, NES students scored slightly higher than NSS in reading and language, and slightly lower on math.

First and second grade students in two 90/10 programs in Oklahoma City showed higher scores on both the English and Spanish LAS (*Language Assessment Scales*) tests in April than in the previous September (Coy & Litherland, 2000). TWI students at these two schools were tested in reading, language, and math with the Spanish version of a nationally normed test (*Supera*), and students in English-only (EO) classes at those schools completed those subtests on the parallel English version (*TerraNova*). At one school, first grade TWI students scored higher than EO students on all three subtests, even scoring above the national average in reading and language. The second grade TWI students in that school scored lower in Spanish reading and language than the students in the EO classes did in English reading and language, but the TWI students scored higher in math. Students in the second school scored lower overall, but showed similar patterns, as the TWI first graders scored higher than EO students in reading and language but lower in math, and the TWI second graders scored comparably to EO students in reading and language but much higher in math.

Stipek, Ryan, and Alarcón (2001) presented an evaluation of the academic achievement and language use of the pre-kindergarten to second grade students enrolled during the first year of implementation of a TWI program. The study involved classroom observations and math/literacy assessments of NES in the monolingual English part of the school and NES and NSS in the TWI program. Native Spanish speakers made similar gains in English and Spanish over the year, and similar gains in English to the NES. Native English speakers in the TWI and English-only programs made similar gains in English literacy; however, the two-way NES made smaller gains in Spanish literacy than English literacy (and smaller gains than NSS in either language). The study also found that in first and second grades, English-only students received more mathematics instruction and the TWI students received more literacy instruction. Correspondingly, NES in the mainstream program made larger gains over the year in math than NES in the TWI program, and the two-way NES made higher gains in literacy than mainstream NES. Interestingly, first and second grade NES in the TWI program made larger gains in Spanish than pre-k and kindergarten students, although classroom observations determined that teachers in the older grades used more English than the pre-k and kindergarten teachers. The authors indicated that some of these results may stem from the fact that, despite intentions, in the first year of the program, English and Spanish were not equal in status or in use in the two-way program.

Also comparing native English-speaking TWI and non-TWI students, Sera (2000) found that students in a newly-implemented, midwestern TWI program scored equal to or higher than students in a mainstream class in the same school on the *California Achievement Test* in first grade and on the *ISTEP* in third grade. TWI first graders outscored mainstream students in the vocabulary subtest in first grade and in the math computation subtest in third grade. Scores on a non-verbal cognitive test were not significantly different between the two groups. Half of the 13 NES third graders had achieved the level of "limited speaker" on the Spanish *LAS-O* (scoring between 55.4 and 67.1 out of 100), while the other seven students scored in the "non-speaker" range (scoring between 21.3 and 48.0). On a measure of English syntax development, there was

no statistical difference between TWI and non-TWI students on three of four subtests, indicating that the TWI students' English development was not hindered by their second language learning.

In their first year, students in a 90/10 TWI program in southern California performed very well on standardized measures of achievement (Lindholm & Fairchild, 1990). On average, the participating kindergarten and first grade students scored at or above average in reading and math in Spanish (*La Prueba*), and demonstrated gains over the course of the school year in second language skills on a Bilingual Syntax Measure. Native English speakers showed gains in Spanish reading on the *California Test of Basic Skills* (*CTBS-Español*) between the pretest and posttest periods. Both NES and NSS showed growth over the year in Spanish math on that assessment, with all students scoring at or above grade level in reading and math. In spite of receiving only 10% of their instruction in English, native Spanish speakers in the TWI program scored equal to comparison students in an English-only program on the *CTBS-U* (English reading and math), and NES in the TWI program outscored students in the EO program on that measure.

Lindholm and Aclan (1991) examined the relationship of bilingual proficiency and academic achievement in first through fourth grade students in established 90/10 TWI programs in San Diego. Students scoring high on the *Student Oral Language Observation Matrix* (*SOLOM*) in both Spanish and English were classified as "high," those in the middle range on both tests as "medium," and those in the low range in their second language as "low." This bilingual rating was found to correspond to performance on reading and math scores in English and Spanish. All students (except "lows" and "mediums" in second grade) scored at or above the national average in Spanish reading and math, demonstrating achievement in the language in which the majority of their instruction had taken place. While NES students consistently outscored NSS students in English reading and math (scoring at or above average), by fourth grade "medium" NSS students were scoring just below average and "high" NSS students were scoring just above average in English reading and math, despite not yet having received math instruction in English. The authors noted that the ability to demonstrate content area knowledge in a given language (English) is inhibited by a lower level of proficiency in that language. They concluded that full academic language proficiency is needed in both languages for the bilingual student to accrue full academic advantages, and that bilingual proficiency is a bridge to academic achievement.

A similar study examined English reading scores on the *Iowa Test of Basic Skills* of 12 seven- and eight-year-old children enrolled in a Texas 50/50 program for two years (Lucido & McEachern, 2000). The authors found that the more balanced bilinguals received the highest scores, the less balanced bilinguals received lower scores, and those students with the lowest scores demonstrated other cognitive delays unrelated to participation in a two-way program.

Finally, one of the most frequently studied programs is the Amigos program in Cambridge, Massachusetts. Cazabon, Lambert, and Hall (1993) compared native English speakers and native Spanish speakers from the Amigos program with NES students from a mainstream program and NSS students from a transitional bilingual education (TBE) program. These students were matched relatively well in terms of socioeconomic status and non-verbal intelligence test scores. NES Amigos performed as well or better than their NES peers in English reading and math (measured by the *California Achievement Test* [*CAT*]), and in general, both groups performed at or above grade-level norms. NSS Amigos always performed better than NSS controls in English

reading and math, and both groups scored at grade-level norms in math, but both groups frequently scored below grade-level norms in reading. In Spanish reading (*CTBS-Español*), NES Amigos generally performed below grade-level norms and slightly below NSS Amigos, but in math, they performed above grade-level and higher than NSS Amigos. The NSS Amigos performed slightly above norms in reading in first grade and slightly below in second and third grade in Spanish reading, and scored higher than NSS controls in grades 1-2, with no significant difference in grade 3. In math, they scored higher than the NSS control group. Overall, since the Amigos results were usually the same as, or better than, those of the control groups, the authors concluded that there were beneficial effects of participation in the program.

Academic Achievement in the Upper Elementary Grades

Gilbert (2001) compared fourth graders across three school sites in Texas, each of which housed a TWI program (for NES and NSS students), a developmental (late-exit) bilingual education (DBE) program (for NSS students), and a regular monolingual English program (for NES and a small number of NSS who were excluded from the study). Using standardized test scores, the author found no differences in Spanish reading, math, or student self-concept between the NSS in DBE and TWI, but found that NSS in the TWI program scored higher in English reading than their DBE peers. She found no difference in English reading and math nor in self-concept between the NES in the monolingual English program and those in the TWI program. The author concluded that because native language development was equivalent for NSS in the Spanish-dominant (90/10) DBE program and in the balanced (50/50) TWI program, and second language development was superior in the TWI program, the TWI program was more beneficial for the NSS than the DBE program. Similarly, NES progress in English was not impeded by their participation in the TWI program (as compared to their monolingual program peers).

Barbieri Elementary School in Framingham, Massachusetts, which uses a differentiated model in which students receive initial literacy instruction in their native language, demonstrated positive academic achievement of fifth graders in six cohorts (1995 through 2000) on nationally normed standardized achievement tests (the *Aprenda* in Spanish and the *Stanford 9* in English) (de Jong, 2002). NSS students scored above their NES peers in Spanish reading and slightly below the NES in Spanish math, and both groups scored at or above grade level. Fifth grade NES students consistently scored above NSS and above the 50th percentile in English reading and math, while NSS students scored just below average in English reading and above average in math. On the English language state test in fourth grade, both NES and NSS students averaged higher scores in language arts, math, and science and technology than state or the district averages (when NES were compared to students in the standard curriculum and NSS were compared to all Limited English Proficient [LEP] students). Furthermore, the average score at Barbieri was usually above the "proficient" mark for NES and consistently above "passing" for NSS.

Alanís (2000) examined linguistic and academic achievement of 56 fifth-graders enrolled for at least three years in established Texas 50/50 programs. The author found that TWI students were meeting state expectations of academic achievement as measured by the English *Texas Assessment of Academic Skills* (*TAAS*). On average, the TWI reading scores were at or above the state passing level and were slightly higher than non-TWI students' scores for each of the three

years of testing. Native English speakers in the TWI programs performed slightly better than their native Spanish-speaking counterparts, who performed similarly to their non-TWI peers. TWI students also scored at or above state passing levels on the math test and were comparable to non-TWI students. Length of time in the program affected scores, with those students enrolled for three or more years receiving the best scores.

In another study of TWI programs in four Texas school districts, Kortz (2002) found that English language learners in third grade were meeting state expectations for reading as measured by the English and Spanish TAAS. His study correlated the use of *Accelerated Reader* (*AR*, a computer-assisted learning program aimed at improving the quality and quantity of reading practice through leveled reading and continuous assessment) with higher TAAS scores. For both the English and Spanish TAAS, higher reading levels, higher accumulated points (gained by reading books and passing tests), and higher scores on *AR* assessments correlated with higher TAAS scores. He concluded that students reading at the 2.6 *AR* level or above could be expected to achieve the state minimum passing scores, and those who accumulated 31-45 *AR* points could be expected to pass the TAAS at the mastery level.

At the Inter-American Magnet School (IAMS) in Chicago (see "Program Profiles" section for a description), Kirk Senesac (2002) compiled standardized test scores from 1998, 1999, and 2000. On state standardized tests, IAMS students consistently scored above district averages in terms of the percentage of students meeting and exceeding state goals in reading, writing, and math (tested in third, fifth or sixth, and eighth grades). They scored very close to or above state averages as well. A higher percentage of IAMS students also met state goals in social studies and science (tested in fourth and seventh grades) than all district students, although the comparison to state averages was more variable. Scores on the *ITBS* for LEP students eligible for free/reduced lunch who had been at IAMS for at least five years also showed that third through eighth graders performed at or above grade level in English reading and math. Students scored above the 50th percentile on the Spanish reading (*La Prueba)* in third through eighth grade for reading, and scored above the 55th percentile in Spanish writing, with seventh and eighth graders scoring from the 68th to the 83rd percentile.

Clayton (1993) analyzed reading and math scores of fifth to eighth grade students in TWI and transitional bilingual (TBE) programs in two small rural districts in Southern California with mixed Latino/Caucasian/Native American populations. She found that among the NSS students, TBE students scored higher in English reading over both years of the study (1991 and 1992), the same in math in 1991, and higher in math in 1992 (both tests administered in English). NES students in the TWI program scored higher in reading than NES students that were not in the TWI program. There was no correlation between first- and second-language reading among the two language groups in the TWI program, but there was a correlation between the English and Spanish math scores for both language groups. The higher parent education levels of the students in the transitional program and the fact that the middle school TWI program was relatively new were two factors that were seen as possibly affecting the outcomes.

In a follow-up report to the research mentioned in the section on achievement in the primary grades, Cazabon, Nicoladis, and Lambert (1998) again studied a cross-sectional sample of Amigos students, using *California Achievement Test* (*CAT*) scores for English achievement and

Spanish Assessment of Basic Education (*SABE*) scores for Spanish, and controlling for non-verbal intelligence with the *Ravens* assessment. NSS Amigos scored above NES controls (NES in mainstream programs) on *CAT* reading in grades 4-6 and grade 8, but below in grade 7. They also scored above NES controls on *CAT* math in grades 4-6, below in grade 7, and equal in grade 8. NES Amigos scored above NES controls on *CAT* reading and math in grades 4-8 (except seventh grade math, where there was no difference). In Spanish, there was no difference on *SABE* reading between NSS Amigos and NSS controls (NSS in TBE) except at grade 8, where NSS Amigos scored higher. In math, there was no difference between NSS Amigos and NSS controls in grades 4 and 7, while NSS Amigos scored higher in grades 5, 6, and 8. NES Amigos scored below NSS controls on SABE reading in grades 4-6 and equal to NSS controls in grades 7-8. In math, there was no difference in grade 4, but NES Amigos scored above NSS controls in grades 5-8. Overall, once again, there was a positive indication of performance relative to peers in other programs within the school district.

Conclusion

On aggregate, the research summarized in this section indicates that both native Spanish speakers and native English speakers in TWI programs perform as well or better than their peers educated in other types of programs, both on English standardized achievement tests and Spanish standardized achievement tests. Within TWI programs, native speakers tend to outperform second-language learners, such that NES tend to score higher on English achievement tests and NSS tend to score higher on Spanish achievement tests. Additionally, students rated as balanced bilinguals with high levels of proficiency in both languages tend to outperform other students, perhaps lending support to Cummins' threshold hypothesis (Cummins, 1991), which states that high levels of bilingualism are required before cognitive benefits can be attained. Finally, there is some indication of transfer of content knowledge, as students were sometimes instructed in one language and assessed in the other, and still demonstrated grade-appropriate mastery of the content. For all of these studies, the methodological concerns raised earlier must be taken into consideration. In other words, any differences found or not found across groups of students within TWI and across program models may have to do with differences in student backgrounds, general quality of school environment independent of program model, etc. As a result, these findings should be interpreted cautiously. At the same time, the consistency of findings across studies suggests that the conclusions discussed here have credibility.

Language and Literacy Outcomes

Along with academic achievement, language and literacy outcomes of TWI students are two areas of great interest to those in the field, and there has been a fair amount of research dedicated to these topics. To date, only one large-scale, quantitative study of bilingualism and biliteracy development in TWI programs has been conducted, through the Center for Research on Education, Diversity, & Excellence (CREDE) and the Center for Applied Linguistics (CAL) (Howard, Christian, & Genesee, 2003). Most of the remaining research has been qualitative, with each study focusing on a relatively small number of students in a single TWI program. Cumulatively, these

studies indicate that, on average, both native English speakers and English language learners in TWI programs achieve the goal of developing bilingualism and biliteracy. The English language learners, however, tend to develop more balanced abilities in the two languages than the native English speakers. In addition, these studies point to the need for research on effective instructional strategies for promoting the language and literacy development of students in the minority language, given that the two interventions described in this section were not effective in attaining this goal.

Oral Language Development

Howard, Christian, and Genesee (2003) investigated the Spanish and English oral language development of 131 NSS and 118 NES in 11 TWI programs across the United States. Using a modified version of the SOPA (Student Oral Proficiency Assessment), they conducted English and Spanish oral proficiency assessments with these students at the end of third and fifth grades. The average oral English proficiency of both groups of students was quite high in both third grade and fifth grade, with average scores in the mid to high 4 range on a scale of 0 to 5. This indicates advanced skills on the part of both native English speakers and native Spanish speakers. In addition, standard deviations for both groups dropped to extremely low and equivalent levels, indicating that the very high mean scores of both groups in fifth grade were reflective of most individual scores as well. In Spanish, both groups of students showed progress from third grade to fifth grade. Native English speakers showed more growth than native Spanish speakers, which was possible as their initial score at the end of third grade was much lower than that of native Spanish speakers. By the end of fifth grade, the mean scores of both groups were in the advanced range, although the mean score of the NSS was still higher than that of the NES. Additionally, the standard deviations of both groups decreased over time, but the standard deviations of the native English speakers were always much higher than those of the native Spanish speakers, indicating much more variability in Spanish language proficiency among native English speakers than native Spanish speakers. In addition, as a group, the native Spanish speakers experienced a subtle shift from slight dominance in Spanish in third grade to comparable scores in English and Spanish by the end of fifth grade, while the native English speakers were always clearly dominant in English.

Based on classroom observations and testing in a 50/50 TWI program in Virginia, Howard and Christian (1997) studied the oral and written development of elementary students in English and Spanish. In English, all NES students entered as fluent English speakers and remained that way, so there was no evidence of the TWI program causing delay or interference. The NSS students also developed strong English oral skills: all NSS third graders were rated as fluent according to the *LAS-O*, and no significant differences were found in oral English proficiency between NES and NSS students. In Spanish, development was strong but not quite as strong as in English. Eighty-eight percent of NSS tested as fluent in Spanish in first grade as compared to 100% of NES testing fluent in English in first grade. This may be attributed to the fact that most of the NSS had lived all or most of their life in the U.S., and therefore always had had English influence. In second grade and above, 100% of the NSS tested fluent in Spanish. About 20% of NES rated fluent in Spanish in grades 1-2, and about 50% rated fluent in grades 4-5. Overall, NSS tended to be more balanced bilinguals on average than NES.

A locally-developed, interview format, native language assessment instrument was used to compare NES and NSS students in the Amigos program in Massachusetts with NSS controls in grades 1-3 (Cazabon, Lambert & Hall, 1993). In all grades, NES Amigos scored higher in English than NSS Amigos and NSS controls, while NSS controls scored highest in Spanish each year, followed by NSS Amigos and NES Amigos (although the difference between the two NSS groups in third grade Spanish was negligible). Overall, in English, there was no significant group effect for NSS Amigos vs. NSS controls, but there were significant effects for grade and group by grade. There was a significant grade effect and a significant group effect for NES Amigos vs. NSS Amigos, but no significant group effect by grade interaction. In Spanish, for NSS Amigos vs. NSS controls, there were significant differences for group, grade, and group by grade. For NSS Amigos vs. NES Amigos, there were significant group and grade effects, but no group by grade interaction.

Two studies (Montague & Meza-Zaragosa, 1999; Stein, 1997) used an intervention model to examine the outcome of specific curriculum approaches in TWI programs. Stein (1997) studied the effect of Focus on Form (FonF) in a two-way immersion program in Virginia. Because of TWI programs' emphasis on learning language through content, explicit language instruction is generally discouraged. The consequence of such an approach is that students gain reasonable proficiency in their second language but they often lack the grammatical accuracy of native speakers. This is most frequent in the case of native English speakers learning a minority language. In this study, Stein analyzed the effect of FonF in the form of implicit, incidental negative feedback in content classes. This feedback was given in relation to subject-verb agreement and noun-adjective agreement in Spanish. Four groups participated in the study: two experimental classes of fourth graders and two comparison classes of fifth graders. The former were given feedback and instruction on such agreement, whereas the latter were not. The results showed that non-native Spanish speakers were significantly lower in agreement knowledge than native speakers, demonstrating the need for instruction in this area, according to the author. However, this experimental study also showed that there was no significant effect of instruction through implicit feedback between the experimental and control classes. Stein states that this lack of an effect could be due to the subtleties of such feedback (often students do not realize they are being corrected), the lack of consistency with feedback, as the teacher did not give feedback to every error, limited opportunities for feedback because it depends on production, and the short time (6 weeks) allotted to test the effect of this FonF model.

Montague and Meza-Zaragosa's (1999) study examined the role of teacher expectations in minority language production. Participants were 45 pre-literate 4- and 5-year-old children in a 50/50 program, most of whom had been enrolled since age 3. Over the school year, the Spanish classroom teacher modified her level of elicitation during Language Experience Approach lessons. In the beginning of the year, the teacher did not specifically ask children to use Spanish, and the students generally used their stronger language. During the intervention phase, Spanish elicitation prompts were given, and NES students showed a drop in interest and participation, although the responses of NSS students in Spanish increased. Production increased during post-intervention, as did all students' metalinguistic awareness, but it did not return to the level where it was during the baseline phase.

Writing Development

Howard, Christian, and Genesee (2003) investigated the English and Spanish writing development of 344 native English speakers and native Spanish speakers in 11 Spanish/English two-way immersion programs across the United States. Nine waves of writing data in each language were collected over a three-year period, from the beginning of third grade through the end of fifth grade. An analytic rubric was used to score these writing samples on composition, grammar, and mechanics. On average, the native Spanish speakers (NSS) and native English speakers (NES) had remarkably similar trends in English and Spanish writing. At all time points, the mean scores of the native speakers were always higher than the mean scores of second language speakers (such that native English speakers had higher mean scores in English and native Spanish speakers had higher mean scores in Spanish), but the shapes of the trajectories of mean performance for the two groups in the two languages were comparable. Moreover, there was a tremendous amount of overlap in scores across the two groups. While the mean scores of native speakers were consistently higher than the mean scores of second language speakers, there were many second language speakers who scored higher than their native language peers, and vice versa. In other words, many native Spanish speakers scored higher than native English speakers in English, and many native English speakers scored higher than native Spanish speakers in Spanish. The mean English writing ability of native English speakers was always clearly higher than their mean Spanish writing ability. For native Spanish speakers, however, the situation was much different, as their mean scores in English and Spanish were virtually identical at all time points.

In a more detailed analysis of the same dataset, Howard (2003) used an individual growth modeling framework to estimate average growth trajectories in each language, as well as to assess the predictive power of native language and home language use on average final status (end of fifth grade performance) and average rate of change. Three major findings emerged from this study:

1. Writing development in both English and Spanish slowed over time, with faster growth in third grade and slower growth over fourth and fifth grades.
2. Both native language and home language use were significant predictors of English writing development, with native language related to both final status and rate of change, and home language use related only to final status. After controlling for gender, free/reduced lunch eligibility, and participation in special education, being a native English speaker and speaking more English at home were associated with higher average final status in English writing, although the gap between the native language groups diminished over time.
3. Home language use was a significant predictor of Spanish writing final status. After controlling for gender, personal problems, participation in special education, and free/reduced lunch eligibility, speaking more Spanish at home was associated with higher average final status in Spanish writing at the end of fifth grade. There was also a significant interaction between home language and free/reduced lunch on the rate of change of Spanish writing development, with students who were eligible for free/reduced lunch having varying rates of change in relation to home language use, and students who were not eligible for free/reduced lunch having the same rate of change regardless of home language use.

Serrano and Howard (2003) investigated English influence on the fifth grade Spanish writing ability of 55 native Spanish speakers in three 90/10 TWI programs. Serrano and Howard found that many samples demonstrated evidence of English influence, but that this influence was not extensive. In other words, most students exhibited a small amount of English influence in their Spanish writing. English influence was noted in three domains: 1) mechanics, 2) vocabulary, and 3) syntax. Influence in mechanics most frequently had to do with spelling or capitalization. In vocabulary, three types of influence were found: 1) direct incorporation of English words, 2) modifications of English words to reflect Spanish morphology and phonology, and 3) applying an English meaning to a similar Spanish word. Finally, at the level of grammar, three types of influence were also found: 1) direct translations of idioms; 2) word order transfer, where English word order was applied in Spanish; and 3) the use of English syntactic constructions in Spanish. English influence was found to be most common in vocabulary, followed by grammar and then mechanics.

Howard and Christian (1997) analyzed Spanish and English writing samples of four NES and four NSS TWI students in the upper elementary grades. They found that, in general, writing in both languages showed reasonable sophistication in all four domains, particularly with organization. The Spanish essays were usually comparable to the English essays with regard to organization and topic development, but they showed more mechanical errors and more linguistic/grammatical errors, usually regarding word order, word choice, and agreement. There was no code switching in the English essays and only a few instances in the Spanish ones, though all were flagged with quotation marks. The English writing samples of NES and NSS were generally comparable, especially in the upper grades (5-6). The Spanish samples of NSS tended to be more sophisticated in terms of vocabulary and grammar than those of their NES peers. However, NSS did make some grammatical mistakes in Spanish, generally at a higher frequency than in their English writing.

In a study using daily journal writing to examine emerging biliteracy in a TWI first grade, Kuhlman, Bastian, Bartolomé, and Barrios (1993) studied 16 Mexican American NSS and NES. The program was whole-language oriented and separated students by native language for language arts in the morning, with everyone together for content instruction in Spanish in the afternoon. Students wrote in their journals for 10 minutes every day after lunch, in their language of choice. Once a week, researchers observed the writing process and tape-recorded students reading their journal entries aloud. The authors found a general developmental trend—1) squiggles/drawings, 2) alphabet letters, 3) lists, and 4) sentences—but not all students passed through all stages, or in the same order. There were no differences in patterns for NSS and NES, although NSS tended to start at a different stage (letters and numbers) than NES (lists or sentences). The researchers attributed this possibly to the kindergarten curriculum, which emphasized oral English over Spanish writing for NSS. There was very little evidence of spontaneous second-language writing. There was social interaction among children during journal writing, and it seemed to make a big difference. More advanced students helped students who were at earlier stages, and native language speakers provided second-language writing encouragement to their peers in the other language group.

A qualitative study of the biliteracy development of NES and NSS in a Spanish/English TWI program in the Northeast illuminates the connection between the first, or native language

(L1) and the second language (L2) in a curriculum that employs a process writing approach (Gort, 2001). In relation to *strategic codeswitching*, it was found that developing bilingual writers used their full linguistic repertoire when writing in both the first and second languages. For the most part, students used both languages while creating the texts, but the final product was monolingual. More specifically, Spanish-dominant children used English and Spanish when writing in both languages, but English-dominant children used both languages only when writing in Spanish. Codeswitching facility depended on several factors: the child's language dominance, bilingual development, the linguistic context, and the language proficiency of the interlocutors. Regarding *positive literacy transfer*, the students applied skills learned in one language to writing in the other language. It was discovered that for mature literacy processes (skills that are maintained once learned), both Spanish and English dominant children transferred patterns from their first language to their second language. As for immature processes (skills that are developmental and temporary), for both groups of students these skills appeared first in L1, then in both L1 and L2, and then in L2 only before disappearing. Again, transfer was contingent upon degree of biliteracy. Concerning *interliteracy*, it was found that developing bilingual writers inappropriately applied language specific elements, such as literacy and print conventions, of one language to the other. For both NES and NSS, these errors appeared in L1 writing first, then temporarily in both L1 and L2, and then again in L1 only.

Ha (2001) analyzed the writing ability of native English speakers and native Korean speakers (NKS) in grades 1-5 in a Korean/English 50/50 program. Although examined cross-sectionally, the author found that both NES and NKS showed progress in writing ability in both languages, although Korean writing didn't seem to experience the same leaps at each consecutive grade level that English did. For both groups of students at all grade levels, Korean writing ability was lower than English writing ability, and that gap was bigger at each consecutive grade level. Korean speakers tended to be more balanced bilinguals, showing higher writing ability in Korean than NES. Students did not show signs of L2 interference in L1 writing, and there did not seem to be a delay in writing ability in either language.

Reading Development

The majority of research on the development of reading ability among TWI students has used standardized academic achievement measures as indicators of reading ability. As a result, those studies were included in the previous section on academic achievement and are not repeated here.

As part of the large-scale study discussed above, Howard, Christian, and Genesee (2003) looked at the English and Spanish reading performance of 344 TWI students in 11 programs across the United States. Cloze measures of English reading comprehension were collected at the beginning of third grade and the end of fifth grade, while a cloze measure of Spanish reading comprehension was collected only at the beginning of third grade. In English, the native Spanish speakers made slightly more mean progress than the native English speakers, but this was likely due, at least in part, to the fact that their mean scores in third grade were lower than those of the native English speakers. At both points, the mean scores of the native Spanish speakers were lower than those of the native English speakers, although the gap narrowed over the three-year period. In Spanish, there was once again a native language effect, where the average scores of native

Spanish speakers in third grade were significantly higher than those of native English speakers. Comparing across languages at the beginning of third grade, the native English speakers had a slightly higher mean score on the English reading assessment than on the Spanish reading assessment, and the opposite was true for the native Spanish speakers. In other words, both groups had slightly higher mean scores in their native language than in their second language.

A study of 156 second, third, and fourth grade students in a Korean/English TWI program (Bae & Bachman, 1998) demonstrated that listening and reading skills in Korean were related for both native and non-native Korean speakers. Using a latent variable approach (structural equation modeling), the authors concluded that for both groups of students, the two language comprehension variables were factorially distinct, with a high correlation between listening and reading. Additionally, there were different amounts of variation in listening vs. reading across the two groups. There was more variation in listening ability among non-native Korean speakers because native Korean speakers were fluent and all scored at the top of the range. In contrast, all of the non-native Korean speakers had limited reading ability in Korean, and therefore, scored toward the bottom of the scale in reading, so there was more variation among native Korean speakers.

Conclusion

Several important findings can be drawn from the research on language and literacy development in TWI programs:

1. There seems to be a native language effect, such that native speakers generally perform higher than second language speakers in terms of both oral and written language proficiency.

2. Not surprisingly, there seem to be slightly different patterns for NES and language minority students, with NES always showing a clear dominance in and preference for English, and language-minority students demonstrating more balanced bilingualism. Sometimes the language-minority students tend to perform slightly higher in their native language, and other times slightly higher in English. In general, however, their performance on language and literacy measures across languages is much more similar than that of their NES peers.

3. There is some evidence for transfer of skills across languages, with some studies reporting similar writing processes and products across the two languages. This is not the case in the writing study conducted in a Korean/English program, however, and may point to differences in the amount of potential cross-linguistic transfer and/or interference that may occur depending on the similarities or differences in orthographies in the two languages of instruction.

4. Both the Korean reading study in this section and the reading studies presented on academic achievement point to inter-relationships between language and literacy skills within and across languages.

From a methodological standpoint, because many of these studies involved relatively small numbers of students in a single TWI program, generalizability is limited. Additional research that looks at language and literacy development of TWI students on a larger scale is needed for a more comprehensive understanding of the developmental trajectories of oral language, reading, and writing in two languages. Further research is also needed to learn more about the developmental

processes that children go through as they become bilingual and biliterate, and the instructional contexts that may impact that development, such as initial literacy instruction or the amount of instruction provided through the minority language. Finally, intervention studies, perhaps of longer duration than those reported here, are needed to learn more about effective instructional strategies for promoting oral and written language development in two languages.

CULTURAL CONTEXT AND SOCIAL IMPACT OF TWI

Two-way immersion programs in the U.S. operate in a society that is not always supportive of bilingualism and bilingual education, as evidenced by recent ballot initiatives such as Proposition 227 in California and Proposition 203 in Arizona. According to Freeman, the mainstream view of language minority students is that "...the native language and culture is seen as a problem to be overcome, and as a handicap to full participation opportunities. The solution to this problem is for the LEP student... to assimilate to monolingualism in standard English and to White middle-class norms of interaction and interpretation in order to participate and achieve in school" (1994, pp. 7-8). Two-way immersion programs, in contrast, encourage linguistic/cultural minorities to maintain their language and heritage and teach all students the value of cultural and linguistic diversity. Most of the literature reported in this section affirms the positive social impact of TWI education, but some authors issue cautions regarding potential areas of inequity in these multilingual, multicultural learning environments.

Several studies have reported on TWI students' positive attitudes toward their own language and ethnicity, that of other groups, and toward multilingualism and multiculturalism in general. A study of the Amigos program (Cazabon, Lambert, & Hall, 1993) found that students' choice of best friends did not seem to be along ethnic lines, although there did seem to be some influence of ethnicity on whom children sat with at lunch and whom they invited to parties. In general, however, there was not much self-segregation or exclusion based on ethnicity. Most students seemed to make decisions about who to work and socialize with "in an ethnic-blind and color-blind random fashion" (Cazabon, Lambert, & Hall, 1993, p. 22). Lindholm-Leary (2000) found similar results in students' attitudes toward multiculturalism, noting that students had favorable attitudes toward other ethnicities and language groups, felt that "speaking another language could help them understand and get along better with other people" (p. 31) and enjoyed meeting people who speak a different language. Likewise, Rolstad (1997) found that Latinos and Filipinos in a Korean/English TWI program had generally more favorable attitudes toward themselves and others than Latino and Filipino students in a comparable English mainstream program. The opposite was true for Koreans. Korean students in the English mainstream program had more positive feelings toward themselves and other groups than the students in the Korean TWI program, which was surprising given the emphasis on Korean culture in the Korean program.

In a discussion paper, Valdés (1997) brought up three concerns that arise when two very different groups with very different agendas (bilingual education/minority students and foreign language education/majority students) come together to implement a TWI program. Her first concern was that the inclusion of NES students leads to watered-down Spanish, especially in the

primary grades, which will have a negative impact on the Spanish language development and overall academic achievement of the NSS. Secondly, she said that students may continue to demonstrate self-segregating behavior either inside or outside of school, in line with broader societal norms, and that this may be damaging to the minority students who may feel excluded. Finally, Valdés stated that the increasing numbers of majority students becoming bilingual could take away the bilingual advantage of minority students. In other words, if employers from the majority culture are faced with the choice of hiring a bilingual person who is like them vs. a bilingual person who is different from them, they will choose the bilingual person who is more like them.

Program and Classroom Contexts

Many schools, such as Oyster School in Washington, D.C. (Freeman, 1994, 1998) and La Escuela Fratney in Milwaukee, Wisconsin (Ahlgren, 1993) were specifically established to combat the societal and educational discrimination of minorities. Oyster, for example, which was started in 1971 as a grass-roots community effort, was said to strive for additive bilingualism and to encourage all of its students to see each other as equals (Freeman, 1994, 1998). This school demonstrated its commitment to this ideal by encouraging the development of minority students' native language and culture, using a multicultural curriculum, assessing students with multiple, and often "alternative," methods, and expecting a respect for diversity within the community. Fratney (Ahlgren, 1993) also used a multicultural, anti-bias curriculum, and incorporated themes "stressing social responsibility and action" (pp. 28-29) where learning to value others' cultures and languages was explicitly taught.

At the classroom level, teachers can also incorporate multicultural perspectives and validate the students' background knowledge and experiences. For example, one study (Arce, 2000) described a first grade TWI classroom where the teacher implemented a student-centered curriculum and aimed to empower the students, build a sense of community, and use the students' life experiences in the learning process. Through critical reflection, the teacher developed a classroom atmosphere, as well as specific activities, that focused on making meaning through interactions and critical thinking.

Takahashi-Breines's (2002) description of a third grade TWI classroom teacher in a successful program in New Mexico echoed these same themes. She also illustrated how this New Mexican teacher further enhanced her students' learning environment through the connections she made to their prior knowledge, through an environment that makes explicit reference to bringing the values and expectations of their home and community into the classroom, and by creating a sense of intimacy and solidarity between herself and her students.

In another example of a student-centered classroom, Buxton (1999a, 1999b) reported the findings from the "Science Theater/Teatro de Ciencias" project in a second/third grade two-way class in a small Western town, where science was taught in both English and Spanish on alternating days. This instructional approach not only provided opportunities for students to think, analyze, and talk about science concepts, but also allowed them to relate science to their personal

lives and to society as a whole. The activities were related to students' experiences and previous knowledge, and also to issues that had social implications.

Hadi-Tabassum (2000) described how certain two-way classrooms exemplified the principles of multicultural science (see Pomeroy, 1994), integrating content with the students' cultural and linguistic backgrounds. The instructional approach that was used not only provided a student-centered curriculum, and class work done in linguistically heterogeneous teams, these classes emphasized multiple epistemologies and ways of being "scientifically literate" (Hadi-Tabassum, 2000, p. 25). At the same time, activities drew upon students' interests and background knowledge about the world. Alternative assessment methods, such as the use of portfolios, allowed students to demonstrate both content and linguistic knowledge, as well as their metalinguistic awareness through the use of both languages. This empowering model increased the ability of minority students to relate to science and to express themselves in the "language of science," thus increasing their academic success.

African American Participation in TWI Programs

A small number of studies have addressed how African American students fare in TWI programs. In a case study of an established TWI program in the Northeast with a diverse student population, Carrigo (2000) characterized the school as doing a relatively good job of promoting positive attitudes toward Latinos and the Spanish language, but providing less support for African American students, who made up a sizable population at the school. She found that African American students tended to be over-represented in low-ability tracks during Spanish language arts instruction, and that the students who were the most resistant to Spanish language use in the classroom were African American. The author observed that the school's curriculum was not culturally responsive or inclusive of African American students and the knowledge that they bring from home.

Parchia (2000) studied African American enrollment and participation in two historically successful East Coast 50/50 TWI schools. She found that parents' primary motivation for enrolling and keeping their children in TWI schools was finding a school that gave their children the best chance for future educational and job successes. These parents were said to be engaged in "black flight," taking their children out of segregated, ineffectual neighborhood schools. Students acknowledged the multicultural intention of their schools, although they thought that the TWI programs hadn't taught them much about their own heritage. African American parents were also concerned that the schools emphasized Latino cultural and academic concerns more than their own, but said that they were willing to make trade-offs—less instruction in English to gain Spanish, and less instruction about African American heritage to attend a multicultural, integrated school. Unlike non-TWI and non-integrated schools, "respondents reported that interracial conflicts and same-group separation/segregation were virtually non-existent among students and parents" (p. 193).

In investigating a 90/10 Midwestern TWI program's effectiveness for low-SES, African American students, Krause (1999) collected graduation rates and reading scores for all of the five cohorts of students who had graduated from fifth grade from the program. The program was

generally 21-30% African American, and included African heritage components in the curriculum. The author found that African Americans were less likely to graduate from fifth grade (as opposed to transferring to another program in the district) and less likely to be reading on grade level than their White or Hispanic peers. Being African American and having more frequent absences during the year were the best predictors for leaving the program, and being African American, qualifying for free/reduced lunch, and being retained were the best predictors to be reading below grade level by fifth grade. The author suggested further research to determine whether the true predictor is race or actually the dialect of English brought to the program (requiring African American Vernacular English speakers to become trilingual without support in their native dialect). This suggestion was drawn from her conclusion that the African American students "lost" 50% of the time to Spanish instruction that they could have had being exposed to standard English.

Prompted by the controversial book, *The Bell Curve*, Nicoladis, Taylor, Lambert, and Cazabon (1998) put forth the hypothesis that if intelligence were genetic and associated with race, then African American students in the Amigos program would be expected to have lower scores than White Amigos students on both English and Spanish achievement tests. If it were a sociocultural issue, however, then one would only expect them to perform lower in English because the playing field would be leveled in Spanish, a new language to both groups. The authors used accumulated achievement data from students in the Amigos program from 1989-97 to increase sample sizes of each racial/ethnic group at each grade level (for grades 1-4). All students were administered three tests: the *Ravens* for non-verbal intelligence, the *CAT* for English reading and math achievement, and the *SABE* for Spanish reading and math achievement. On average, the African American students scored lower on the Ravens, so the scores were presented in two ways: as raw comparisons and as controlled comparisons, controlling for differences in non-verbal intelligence. Majority students always outperformed African American students on English reading and English math, even when controlling for non-verbal intelligence. Majority students also outperformed African American students in Spanish reading in the raw comparison, but there was no significant difference between groups in grades 1, 3, or 4 when controlling for non-verbal intelligence. Similar results were found for Spanish math, except that in third grade there was no significant difference even before controlling for non-verbal intelligence, and when controlled for, African American students actually scored higher. The authors concluded that these results indicate the predominance of environmental factors over genetic ones in the achievement of African American students relative to majority students.

In terms of self-perception and perception by others, in Cazabon's (2000) study, African American students scored similar to White students in the Amigos program in language use (e.g., using English predominately outside of school), but more similarly to Latino students in integrative and instrumental motivation (seeing the importance of knowing students from other backgrounds and being bilingual) (see "Student Attitudes" section below for more details). On a Student Judgments Survey, teachers rated African American and Latino students lower than White students in terms of their scholastic competence, but rated all three groups equally in sociability and behavior.

Conclusion

As stated earlier, one of the primary goals of TWI is to foster cross-cultural awareness. To that end, all programs need to be concerned with cross-cultural issues. As is clear from the research presented in this section, some programs began with a multicultural focus as the primary motivating force. Teachers also have the power to emphasize cross-cultural issues in the classroom, whether or not their school does so. Based on the articles reviewed here, programs and/or teachers that emphasize cross-cultural aspects of TWI have a clear multicultural focus, draw on students' personal experiences in developing curriculum, use multiple forms of assessment, and emphasize social responsibility. Moreover, several studies indicate that TWI programs are effective in promoting positive interactions among students of varying native languages and racial/ethnic backgrounds, and that students in TWI programs develop favorable attitudes about themselves and others.

At the same time, there seem to be areas for concern. The limited research on African American participation in TWI programs indicates that programs are not always responsive to these students' needs, and there are conflicting findings in terms of African American student outcomes. Moreover, as indicated in the discussion paper by Valdés (1997), because of the dominance of the English language and native English speakers in U.S. society, TWI programs need to work very hard to ensure equity. The issues raised in this paper, such as language use in the classroom and self-grouping patterns of students, need to be investigated empirically, along with continued research on African American participation in TWI programs and the social/cultural contexts of TWI when languages other than Spanish are used for instruction.

Integration of Language Minority and Language Majority Students

The integration of language minority and language majority (native English-speaking) students for bilingual instruction is a central feature of two-way immersion programs. Glenn (1990) asserts that two-way immersion programs are an important way to provide native language development for minority language speakers, while integrating them into the larger school environment. He states that schools may be *desegregated*, but are only *integrated* if all groups are considered equal socially and academically. That is, where bilingualism and biliteracy are explicit and highly valued goals, where English and minority language (or bilingual) teachers work together in planning and developing curriculum, and where both languages are used for content instruction. While this ideal is a goal of TWI programs, the authors whose work is discussed in this section describe situations in which the reality falls short of the ideal, especially in terms of classroom discourse and cooperative learning activities.

De Jong (1996a, 1996b) has analyzed how different integration approaches can succeed at eliminating the marginalization language minority students suffer in certain bilingual programs. She studied five schools in Massachusetts that integrated language minority and language majority students for content instruction (in either transitional bilingual education or TWI classes), and where the languages of instruction were English plus either Spanish, Russian, or Haitian-Creole.

Even when students in the two language groups were paired for instruction, de Jong observed that this pairing was not enough in itself to promote language learning. Too frequently, students did not actively participate in activities requiring their second language. De Jong asserts that teachers need to consider specific strategies to prevent status differences from being reinforced in the classroom, and ensure that all students get to be both language learners and language models. These strategies included incorporating specific activities to ensure that students from the different groups get to know each other socially and work with each other on academic tasks, intervening when students divide up work based on native language (e.g., having NES do the writing on a project in English), explicitly teaching collaborative learning skills, and raising the status of bilinguals who can act as translators.

A teacher in a southern California TWI charter school incorporated many of these techniques into her first grade, with a classroom and schedule were designed to create student interaction (Foster, 1998). The teacher, who was trained in cooperative learning strategies, encouraged interaction across the language groups, and indeed, students often chose cross-L1 partners, especially for oral/written presentations, when engaged in an activity they were "comfortable" with, or one presented to the entire class (as opposed to the homogenous-L1 language arts instruction time). In interviews, students indicated that friendship and competence were more important than L1 in their choice of partners, and that the linguistic factor was or was not considered depending on the type of task necessary.

Hausman-Kelly (2001) observed kindergartners in a newly created, ethnically diverse 50/50 program in the Northeast. Through seating arrangements, pair assignments, encouraging students to help each other, and having "centers" (small group activities), teachers encouraged cross-language interactions among the students. Students interacted across language boundaries at least half of the time, and explicitly discussed issues of friendship, culture, and language; their interactions were also generally cooperative rather than led by a single individual. Of roughly 100 observed interactions between the students, half involved mixed language groups, but only 38% contained some Spanish. Likewise, 36% of conversations among NSS used some English while only 14% of NES conversations involved some Spanish. Barriers to cross-cultural integration include a lack of extra-curricular interaction, a lack of explicit instruction on how to interact across language groups, an unequal balance of the languages in the school, insufficient cooperative learning activities, and more students with at least some proficiency in English (as opposed to Spanish) in the classroom.

In a study of native English speakers in a fourth grade TWI class, Brauer (1998) noted that the more successful Spanish learners tended to think and plan first before asking for help from NSS. They relied on their own cognitive and metacognitive strategies and confirmed their conclusions, while the less successful students tended to ask for help from their NSS peers right away. She notes (speaking specifically about NSS in Spanish classes) that the role of the native speaker in the TWI classroom may involve translating, clarifying, peer editing, and language scaffolding as modeled by the teacher.

Panfil's (1995) case study of a 50/50 school in Virginia also found that having native speakers of each language in the classroom facilitates second language learning. She found that native speakers helped second language learners with vocabulary, syntax, and usage and also

helped to keep the instructional level of the classroom high. She noted that giving help not only contributes to L2 learning for the recipient, but also allows the native speaker giving the help to develop metacognitive and metalinguistic skills.

In a qualitative case study of two "bilingual" (NSS) and two "monolingual" (NES) Latino first-graders in a Texas 50/50 program, Aguilar (2000) found that TWI students value learning a second language and that the learning processes vary by individual according to their unique abilities and personalities. The growth in complexity and accuracy of students' responses and writing in class indicated that classroom practices such as storytelling, dramatizations, continuous teacher and peer modeling, and consistent collaboration strengthened L1, and in turn L2. Despite parents' concerns that they were not doing enough for their children, the parents' participation in and commitment to the education of their children, and the linguistic input and cultural experiences they provided their children also strengthened L1 and facilitated L2 learning.

Studies regarding the language use of students and teachers in TWI classrooms bear out the concerns that merely integrating L1 and L2 students is not enough to promote the *use* of both languages. Carrigo (2000) studied teacher and student language use in integrated and non-integrated Spanish classes in a case study of an urban TWI school in the Northeast. This established Spanish/English program had a diverse student population (Latino, White, and African American), and had difficulty preserving Spanish time in the upper elementary grades, in part because the NES students were allowed to enter the program in the upper elementary grades. In addition to noting that teachers used a lot of English during Spanish instructional time, Carrigo found that when students were grouped by native language, teachers directed more comments in Spanish to the NSS group and more comments in English to the NES group, and also directed fewer comments to the NSS group in general. Like the teachers, the students used a lot of English during Spanish time. During Spanish instructional time, their use of Spanish changed depending on whether or not the situation was integrated. In non-integrated (L1) groupings, both NES and NSS used more Spanish relative to English than in integrated groupings, especially when initiating conversations with teachers and making comments. However, in classes that used integrated groups, students read aloud in Spanish and responded to teacher-initiated conversations in Spanish more often than students in L1-grouped classes.

In comparing TWI and mainstream first grade classrooms in a Northeast school, Ajuria (1994) noted that the mainstream classroom was more "traditional," with teacher-fronted instruction, desks in rows, and fewer reading materials for student use, while the bilingual classrooms (English and Spanish) were more flexible and collaborative. In terms of interaction, she found that the students in the TWI classrooms were praised more frequently, had higher metalinguistic awareness, and had more opportunities for voluntary participation than students in the mainstream class. In the TWI program, NSS students volunteered to participate more often than NES in Spanish, and NES volunteered more in English. Rates of voluntary participation rose significantly for both groups in Spanish throughout the year. Neither language group was criticized by the teacher for behavioral reasons any more than the other language group (in either program); however, the Hispanic students were criticized for academic reasons slightly more often than NES in the TWI program. When compared to their academic performance, where native speakers outperformed second language learners and TWI students outperformed students in the mainstream class, some of these classroom factors become significant. For both classes and

language groups, there was a correlation between teacher praise for cognitive reasons and voluntary participation and between participation and test scores.

Also on the topic of student language use, Pierce's (2000) discourse analysis of student utterances in a third grade TWI classroom during math instruction revealed that students collaborated in asking for help, giving directions, and providing strategies, and that this collaboration took place only in English in the English classroom, but in both English and Spanish in the Spanish classroom. Further, the emphasis of collaboration was linguistic in nature in the Spanish classroom, while it focused on math content in the English room. Pierce concluded that students used English because it was easier and more efficient for getting work done and also because it made it easier for everyone to be involved in activities. Additionally, she found that native Spanish speakers couldn't always serve as language resources in the Spanish classroom (depending on their individual personalities and/or language skills), so there wasn't always a reversal of status roles as is the ideal in TWI programs.

In contrast, Lindholm-Leary's (2001) study found that both teachers and students in the primary and elementary classrooms she observed adhered to the separation of languages, and did not mix the two languages. Furthermore, students answered most of the time in the language directed to them by the teacher.

Conclusion

The integration of language-minority and language-majority students is a key feature of TWI. The studies reviewed here, most of which used qualitative methods, document some of the ways that teachers make an effort to foster collaboration across groups, such as having purposeful seating arrangements and student pairings, and using cooperative learning strategies and centers. As many of the studies in this section indicated, however, merely grouping students does not promote collaboration in and of itself. If students do not know how to work together and help each other, then productive collaboration will not occur. Teachers need to teach students these skills, and monitor group work in order to ensure that native speakers are not doing all of the cognitively and linguistically challenging tasks.

Several studies reported that students benefit from working together in integrated settings. The constant presence of native speakers in the classroom, regardless of the language of instruction, helps second language learners acquire vocabulary and syntax, while the native speakers themselves benefit by gaining greater metalinguistic awareness through their language brokering activities. Some studies have indicated differences in peer interaction during Spanish instructional time and English instructional time, both in terms of focus and language use. The focus of collaboration during English instructional time seems to relate more to content, while the focus during Spanish instructional time is more linguistic. In addition, collaboration during English time almost always occurs entirely in English, and collaboration during Spanish time also frequently involves the use of English. This imbalance is likely related to the greater facility that NSS students have with English, compared to their NES peers' facility with Spanish, as well as the relative status of each language. This issue will be explored further in the following section.

LANGUAGE STATUS

A number of studies about two-way immersion indicate that in spite of educators' best efforts to promote equality between English and the minority language, in many schools there are still very strong societal forces that favor English, and there are outside pressures on schools that diminish their capacity to give the two languages equal attention. For example, the high status of NES in general, especially when those students are from higher SES backgrounds than language-minority students, is one potential reason for the dominance of English in TWI programs. In addition, the current high stakes testing movement that frequently calls for the administration of English standardized achievement tests in the primary grades is an example of an external pressure that threatens the use of the minority language in TWI programs.

Language Status in the Classroom

At the classroom level, English is often inadvertently given more classroom time as both students and teachers tend to code-switch into English during Spanish time, but the reverse rarely occurs (this phenomenon is mentioned in several studies, including Carrigo, 2000; Griego-Jones, 1994; Howard & Christian, 1997). These studies also call attention to the linguistic outcome of this phenomenon; namely, that literacy attainment in Spanish is generally not as fully as literacy attainment in English. Further, although their fluency and ease of communication is generally high, NES tend to demonstrate greater limitations in grammatical constructions and vocabulary in Spanish than their NSS peers (Christian, 1996b).

Delgado-Larocco's (1998) findings in a 90/10 TWI kindergarten in northern California echoed the same concerns as the above studies. In its first year of implementation, the program served two distinct populations: middle/high-SES, White NES who had been to preschool and who had parents who were actively involved in the school, and low-SES Hispanic NSS with less involved parents and little or no prior schooling. The classroom experience, which was mostly teacher-fronted rather than collaborative, and the social life of the school, which was dominated by the native English speakers, did not promote L2 acquisition for the NES. The Spanish instruction, which rarely demanded more than one-word responses in Spanish, and the use of English for most social interactions for both NES and NSS, did not promote L1 development for NSS. All of these social and academic factors contributed to the higher status and development of English at the school.

In Carrigo's (2000) study, teachers noted that in their classes there was vocal resistance by NES to using Spanish, as well as pejorative comments about Spanish. One teacher thought that NSS picked that up and felt self-conscious and embarrassed about using Spanish, thus making them less likely to do so, although they had the skills.

To study the use of English and Spanish during Spanish lessons in a fifth grade TWI class at the Inter-American Magnet School in Chicago, Potowski (2002) focused on two native English speakers (one boy and one girl) and two native Spanish speakers (one boy and one girl) whose Spanish ability and academic achievement were comparable. She found that overall, the students used Spanish 56% of the time and English 44% of the time, but found that more Spanish was

spoken by girls (66% of utterances vs. 47% for boys), to the teacher (82% of utterances vs. 32% student to student) and when on-task (68% of utterances vs. 17% off-task). Native language did not predict language use. Both girls (one NES and one NSS) used Spanish more than the boys, and, in fact, one of the NSS used the most English of the four students. According to interviews, the two girls also felt more personally invested in speaking Spanish. Native Spanish speakers did have more success gaining the floor in Spanish. In general, English served as the social language of the class and Potowski found that English was given priority temporally and symbolically in the school.

Hadi-Tabassum (2002) investigated the ways in which the program ideals of equal use of English and Spanish and strict separation of the two languages played out in a fifth grade classroom in a 50/50 program. She found that the two languages were not used or valued equally, and that this created a tension between the ideal and the reality. She also found that this tension was sometimes dealt with metalinguistically, as students and their teacher occasionally engaged in dialogue about why one language or the other was or was not used in certain contexts. However, as the students themselves noted, these metalinguistic conversations about language use were always conducted in English, thereby reinforcing the unequal status of the two languages, even during discussions about that unequal status.

Language Status at the Program Level

In a case study of Leigh Elementary in Phoenix, Arizona, a school with an ethnically diverse population, a large LEP population, and a high percentage of students qualifying for free/reduced lunch, Amrein and Peña (2000) found three types of asymmetry that favored English over Spanish: 1) *instructional asymmetry*—Spanish teachers were bilingual and could translate for NES who didn't understand, whereas NSS were forced to use all English in English classes because those teachers were not bilingual; 2) *resource asymmetry*—the Spanish class had books, educational materials, and environmental print in both Spanish and English, whereas in English classes everything was in English, and the library likewise had very few Spanish materials; and 3) *student asymmetry*—students tended to self-segregate when possible and only interacted with children from their own language background. The authors concluded that the larger sociopolitical context (e.g., English-only and anti-bilingual education initiatives such as those in Arizona) exerts a tremendous influence on TWI programs and makes them difficult to really implement equitably.

Alanís (2000) found that students in a 50/50 TWI program in Texas were developing proficiency in English, but neither NSS nor NES was making progress in Spanish, especially in the upper-elementary grades. She attributes this to several factors. First, the program's initial goal was not biliteracy, but oral proficiency in Spanish and literacy in English. Implementation of the 50/50 program was weak. By fifth grade, teachers were using more English than Spanish, and they lacked resources in Spanish in the content areas. Further, students saw English as the language of power, both in the school (where morning announcements and routines were always in English) and in the community at large.

Weak implementation was also cited by Stipek, Ryan, and Alarcón (2001) in their report of a new TWI program. In spite of intentions to create a 50/50 program, teachers realized that they

were using more English than Spanish. They attributed this to students' language use and expectations, as both NES and NSS preferred to speak English.

In the context of bilingual programs that continue to struggle to encourage Spanish even among native Spanish speakers (cf. Edelsky, 1996), Smith (2000, 2001) studied the use (or lack thereof) of Spanish in "authentic" settings by students in a predominately Hispanic TWI program in Tucson. Although students were taken to a local (Barrio) market and given opportunities to interact with native Spanish speakers from their home community, Smith found several barriers to the exploitation of local linguistic resources by the TWI program. Older adults, used to the idea of the loss of Spanish in the community, or believing that Spanish was inappropriate in an educational setting, often spoke to students in English, and teachers did not often encourage them to speak in Spanish. Also, many potential linguistic models in the community lacked familiarity with classrooms and language learning, or because of limited literacy abilities were unable to model both bilingualism and biliteracy for the students. The author concluded that the incorporation of local language resources can be useful for encouraging greater use of the minority language among students, but only if community members and teachers are adequately trained, and if students are explicitly taught about the local varieties of Spanish and about language shift and loss.

An ethnographic study in a middle school TWI program with a 77% Hispanic population (mostly of Mexican origin) found that although both English and Spanish were used for instruction in the program, attitudinal factors discouraged the development of biliteracy. McCollum (1994, 1999) wrote that native Spanish-speaking students in this program were shifting to English because their vernacular was devalued by the teachers. Students were constantly being corrected for using "non-standard" Spanish, while native English speakers were praised for any attempt at Spanish. Furthermore, although students were tested at the end of the year in both English and Spanish, the English test was taken more seriously, causing schedule changes and taking up instructional time, and had actual consequences for the students' progress; in contrast, the Spanish test was "given almost as an after thought" (1999, p. 125). When the few native English speakers in the program did poorly on the English test, Spanish was no longer used for instruction, but merely for clarification. In addition, peer pressure to misbehave often resulted in students' using English during Spanish time as a form of rebellion, and the use of English allowed bilingual students more interactions with their peers who spoke only English. Thus, the "hidden curriculum" in this program was to teach students that English was the language of power, and that the use of English was a better alternative for native Spanish speakers than their devalued vernacular.

In an ethnographic analysis of a 90/10 French/English TWI program in suburban Philadelphia, Gayman (2000) found a similar imbalance of the majority and minority language to Spanish/English programs. In unstructured activities and free time, NES students in the observed kindergarten class used their native language almost exclusively, and native French speakers used both English and French, leading to the author's conclusion that English was the language of choice in social interactions. Further, L2 proficiency did not correlate with choice of language: even students who were comfortable and proficient in both languages chose to play more often with their L1 peers. She also found that students were more likely to play and interact with students from the same language group. Of all the analyzed incidents, a high percentage involved students playing alone (25% for NES and 14% for NSS), which also is an impediment to language

learning. In an analysis of a particular linguistic event, the author found that the amount and kind of French used was not adequate for language learning. Due to the structure of the activity and the larger linguistic balance issues discussed above, the event itself reinforced power struggles among the students. She concluded that cross-cultural interactions were not sufficient to meet the social goals of TWI programs, and yet the school provided no instruction or motivation for cross-cultural relations. In spite of the school's official position to promote cross-cultural understanding, larger sociocultural divisions between the French and American families were not able to be overcome.

Conclusion

Taken together, the research on language status provides a clear indication of the challenges TWI programs face as they work toward the ideal of equal status of the two languages of instruction and the two native language groups of students. In study after study, the dominance of English was clearly documented. Many potential reasons were cited for this clear dominance, such as the high status of English and NES, the more fully developed bilingualism on the part of the language-minority students, the lack of available pedagogical materials in the minority language, and the dominance of English in the school-wide environment and/or the larger community. It is clear that TWI programs have to work very hard to promote the status of the minority language and native speakers of that language.

As was the case with the research on integration, the majority of research reported in this section was conducted qualitatively, through classroom observations and interviews with key stakeholders. Both topics lend themselves to qualitative investigation, as it is informative to document the practices and opinions of students, teachers, and administrators as a way of understanding each phenomenon. At the same time, research in these areas could be further enriched by quantitative research with larger numbers of students and programs, which could lend greater generalizability to findings.

STUDENT ATTITUDES

Given that the students are centrally involved in TWI programs, it is important to tap into their attitudes and beliefs to find out more about the effectiveness of the model and the impact that it has on students. The studies reported here indicate that on average, TWI students have positive attitudes toward their programs, bilingualism and biculturalism, and other cultural groups.

Lindholm and Aclan (1993) studied the self-perception and academic performance of students in three Spanish-dominant TWI programs in California. Students' self-perception of psychosocial variables declined from third to fifth grade, confirming previous research of this phenomenon. Although there were no significant differences between native English speakers and native Spanish speakers on psychosocial variables, native English speakers rated themselves higher on academic performance than native Spanish speakers did. The four psychosocial variables (academic competence, physical appearance, self worth, and motivation) showed some degree of correlation at all grade levels, except that motivation and academic competence were not correlated at fifth grade. Students from both language groups showed progress academically,

scoring at or above grade level by fifth grade in reading in their L1 and in math. Students' ratings of academic competence, however, did not correlate with their actual performance. Student motivation was highly correlated with academic achievement in fifth grade, but in general the psychosocial variables were not significant predictors of academic achievement.[2] Prior academic performance and grade level were the best predictors of academic achievement.

Using a questionnaire scored on a Likert scale, TWI students were found to have very positive attitudes overall with regard to their program, teachers, parents, classroom environment, learning, and positive learning behaviors (Lindholm-Leary, 2001). Students in 90/10 programs with a high percentage of students qualifying for free/reduced lunch and high ethnic density (90HI) scored more positively than students in 90/10 programs with a low percentage of students qualifying for free/reduced lunch and low ethnic density (90LO) on language attitudes and classroom environment. Free lunch participants in 90HI programs showed more negative academic attitudes and less satisfaction. African American students who qualified for free lunch were least satisfied, least likely to enjoy or continue in the program, and least positive about home environment, while African American students who did not qualify for free lunch were comparable to Hispanic and European American students on these issues. No difference was found in the self-ratings of Hispanic and European American students on scholastic competence or global self-worth.

Van Dorp (2000) investigated the self-concept of NES and NSS fifth graders in a 40/60 TWI program in Florida versus NES and NSS in the district's corresponding mainstream programs. She found that NSS students in TWI programs displayed higher global self-concept than those in the mainstream. No differences were found for NES in the two programs, nor did esteem correlate with test scores, school achievement, or SES.

In a pilot study of students' attitudes and self-assessments in the Amigos program in Massachusetts, Lambert and Cazabon (1994) gave a 25-question survey to students in grades 4, 5, and 6, all of whom had been enrolled in the program at least four years. In speaking, understanding, reading, and writing, NSS students felt fairly balanced in English and Spanish, whereas NES students felt more English dominant in general, and balanced only in reading. NSS also considered themselves better translators than NES did. All students tended to prefer to use English in public, even with Spanish speakers. Most students wanted to continue learning Spanish. NES students felt that they were ahead of their peers in monolingual programs in English, while NSS tended to feel that they were a little behind—more so the students who spoke "more Spanish at home" than those who spoke "less Spanish at home." In grades 4 and 5, "less Spanish at home" students scored higher on English and Spanish reading than "more Spanish at home" students, but in sixth grade the trend flipped and "more Spanish at home" students did better, showing that the students' perceptions played out accurately in grades 4 and 5 but not in grade 6. Overall, most students preferred ethnically mixed classes and having friends from all groups. They would not prefer to go to an English monolingual school, and they were generally satisfied with the program. In a follow-up paper, Cazabon, Nicoladis, and Lambert (1998) found that NES and NSS students had generally favorable attitudes toward bilingualism and toward the opposite language group, and saw themselves as "a little better" in their first language than in their second language.

[2] This finding is echoed by Ajuria (1994).

Using both longitudinal and cross-sectional surveys of student opinion, Cazabon (2000) studied the self-perception and motivation of students in grades 4-8 in the Amigos program. She found that all groups of students (Latinos, Whites, and African Americans) spoke mostly English outside of school but Latinos heard and used Spanish more than African Americans or Whites in their communities. In terms of perceived competence, Latinos felt stronger in Spanish where African Americans and Whites felt more balanced between Spanish and English. All students reported being asked to translate things for their families, more so as they got older. African American and Latino students scored higher than Whites in terms of integrative and instrumental motivation, showing more understanding of the importance of knowing different kinds of people and learning two languages for their social and intellectual growth. All three groups claimed to know "fairly well" how NSS and "European Americans" think, but only "somewhat well how African Americans think" (p. 106). All of the students responded favorably to having a mixed class and mixed group of friends, as well as to the program structure in general and how well they were learning in it.

Fifth grade students in 50/50 TWI programs in Texas reported positive feelings toward their program and their peers, as well as self-perceived aptitude in both Spanish and English (Alanís, 1998). Out of 15 NSS and 11 NES students participating in a focus group based on Lambert and Cazabon's (1994) questionnaire, the majority of students (88%) reported speaking Spanish at least some of the time at home. With their friends, 54% spoke both English and Spanish, 42% spoke English only, and 73% reported having no tendency to prefer either English- or Spanish-speaking friends. Two-thirds of the students felt balanced in their understanding of both English and Spanish, while for speaking, reading, and writing, the results were that roughly one-third felt stronger in English, one-third stronger in Spanish, and one-third equal. The students were nearly unanimous in thinking they were not behind in English compared to their non-TWI peers, and that they would not prefer to be in an all-English program, although only 73% wanted to continue learning Spanish. None of the students felt confused when their teacher switched from one language to the other. The majority of students also felt that too much time was spent learning English (81%) and not enough learning Spanish (100%).

At a TWI school in the Northeast (Hausman-Kelly, 2001), 44% of kindergarten students said they normally speak in English to their friends, 8% Spanish, and 48% both. Ninety-two percent of the students said they like learning in two languages, and 68% would still like to learn in both languages if given a choice of monolingual or bilingual education (of the others, 8% chose Spanish only [one English-dominant (ED) and one Spanish-dominant (SD)] and 24% chose English only [three ED, two SD, and one bilingual]). Their reasons for these preferences ranged from issues of identity to friendship to competence. Although specifically asked whether it is better to speak English or Spanish, 56% of the students spontaneously responded "both," while 24% chose English and 20% chose Spanish (evenly divided within each between ED and SD students). When asked "Who do you think is the smartest in your class?," 91% of the EDs chose an ED student (the remainder choosing a bilingual student), 100% of the SDs chose an SD student, and 80% of the bilinguals chose an ED student. Ninety-two percent of the students thought they could be friends with a person who spoke a different language, although few students had been to the house of a child who spoke a different language.

Rolstad (1997) compared academic achievement and ethnic attitudes of fourth and fifth grade native Korean speaking (NKS) students and NSS in a 90/10 Korean/English two-way immersion class, NSS in a Spanish/English two-way immersion class, and NKS and NSS in an English mainstream class. All three programs were housed in one school, which may be characterized as highly multicultural, low-income, and with high mobility. The NSS in the Korean TWI program, who entered the program proficient in English, showed high academic achievement and ethnic identification (on a Bipolar Ethnic Attitudes Survey), showing no detriment to having been in the "third language" program except the lack of development of their first language. As far as Latinos' attitudes toward their own ethnic group, those in the Spanish TWI program had the highest positive score, followed by those in the Korean program, then those in the English program. Latinos' rank of ethnic groups (Latinos, Blacks, Filipinos, Koreans, and Whites) varied by program. Latinos in the Spanish TWI class rated themselves above other groups, those in the Korean program rated Whites highest but only slightly higher than themselves, and those in the English mainstream program rated themselves lowest (tied with Blacks). Koreans and Filipinos in both the Korean TWI and English program rated themselves highest over other groups. Latinos and Filipinos in TWI programs had generally more favorable attitudes toward themselves and others than students in the English mainstream program, but the opposite was true of Koreans. It should be noted that these findings were based on a very small sample of students.

Lindholm-Leary and Borsato (2001) studied the attitudes and academic achievement of high school students who previously attended two-way elementary programs in three schools in California, plus a comparison group of Hispanic, native Spanish-speaking high school students. The information was gathered through questionnaires, in which subjects rated their agreement with statements concerning schooling, college ambition, identity and motivation, and attitude toward bilingualism and the two-way program they attended. The results showed that most former two-way students were motivated to remain in school and not drop out, and even to continue on to college. They also appreciated the education they received in the two-way programs, continued to use Spanish, and were proud to be bilingual. Among the former TWI students, there was relatively little difference between Hispanics and Whites or between native English and native Spanish speakers on most issues, although more Hispanic TWI participants "strongly agreed" that they wanted a college degree than Whites or non-TWI Hispanics. These students also felt more strongly about the value of the two-way program. In relation to the comparison group, there were no statistically significant differences; however, the results indicated that students in the two-way program were slightly more motivated and prepared to go to college and were more likely to take higher-level math courses.

Conclusion

The research on student attitudes in TWI programs indicates that in general, students have favorable attitudes toward their programs, bilingualism and biculturalism, and other cultural groups. In addition, TWI students tend to have positive self-perceptions as indicated by their generally high self-ratings of academic competence, motivation, and language abilities. These findings came across repeatedly in multiple studies conducted at various sites around the country. With the exception of the research conducted by Lindholm-Leary (2001) and Lindholm-Leary and

Borsato (2001), the studies included in this section were each conducted at a single site, thus limiting sample size and generalizability. However, the fact that the findings across studies are consistent, including the two larger-scale studies, lends strength to these conclusions.

TEACHER EXPERIENCES AND PROFESSIONAL DEVELOPMENT

Many TWI program practitioners state that a well-qualified and dedicated staff is among the most important factors in a successful TWI program (Sugarman & Howard, 2001). Studies that focus on teachers' professional experiences in TWI programs reveal that TWI teachers are highly aware of and reflective about the specific challenges of teaching in TWI programs as well as the factors that make a program successful.

Howard and Loeb's (1998) study is the only national survey of TWI teachers published to date. Based on questionnaires administered to 181 teachers in 12 TWI programs, along with interviews with 8 teachers (one each from 8 of the 12 programs), the survey found that the vast majority (86%) were female, only 30% had taught in TWI programs for more than 5 years, and they mirrored the linguistic breakdown of student population in those schools: 38% NSS, 45% NES, and 16% native bilinguals. The teachers were well-qualified, with 41% holding and 28% pursuing graduate degrees, and more than half holding bilingual certificates or credentials.

Participants in Howard and Loeb's study perceived the benefits of TWI programs to include opportunities for fairness, and in particular, validation of Spanish language and culture, as well as a greater likelihood of parental involvement of native Spanish speakers. They also noted the professional benefits of autonomy, challenge, the creativity involved in making new curriculum and assessments, team teaching, and the opportunity to use Spanish. The challenges of working in TWI programs included a more labor-intensive environment because everything is done in two languages, the need to explain the second language acquisition process to parents, linguistic challenges like teaching content through a second language and distinguishing second language learning from special needs, tensions between the TWI program and general education program within a school, scheduling, working with a teaching partner, and disagreements among staff about program features. Suggestions for TWI program improvement included recruiting and retaining qualified teachers, providing more pre-service and in-service professional development, hiring a bilingual coordinator and/or parent liaison at the school or district level to advocate for the program and handle administrative tasks, and promoting positive cross-cultural attitudes among all staff in the school—making sure that the staff is cohesive and on-board with the TWI program. Finally, recommendations for what new teachers should know included the structure and goals of TWI, the background of the particular program, subject matter competence and awareness of pedagogical strategies, cross-cultural and linguistic knowledge, and how to work in an integrated setting and elevate the status of language minority students.

Carrigo (2000) reported similar findings from interviews with four upper-elementary teachers in an urban, northeast TWI program. All four were English dominant (two NSS, one NES, one native Portuguese speaker), and all were educated mostly in the U.S. in English. The teachers said that the challenges of teaching in TWI programs include having to do everything in two

languages, constantly being aware that they are teaching second language learners, and trying to integrate other curricular innovations that are district-wide and only in English (like writing curriculum, expeditionary learning, etc.) in a bilingual environment. The teachers talked about the difficulty of maintaining the Spanish language environment for students, and also raised concerns about students comprehending content, noting that they used English to help English-dominant students understand. Three of the teachers tended to code-switch from Spanish to English, the fourth (who teaches a homogeneous group of NSS for language arts) was adamant about not code-switching, but would do it to help newly arrived NSS. The teachers felt pressure from NES parents and students to speak in English, and felt a lack of support from school administration for being strict about using only Spanish during Spanish time. Teachers noted several tensions in the program, including standardized testing in English (and the pressure that puts on them and students), paperwork, meetings, and other demands that detract from teaching time, the need for training in bilingualism and bilingual education, and the effect of a diffuse curriculum with no clear priorities. Finally, they made the following suggestions: more adults in the classroom to lower student/teacher ratio, more training and preparation, more time for reflection and collaboration, support for new teachers, and consideration of program redesign and scheduling.

Lindholm-Leary's (2001) study reinforced the same ideas. Teachers with credentials, training, and experience felt more efficient than teachers without these qualifications, and teacher satisfaction was associated with perception of support (from parents and staff), and by the belief that the school had a good program, met the needs of both groups of students, and had good leaders.

Jackson (2001) studied the relationship between teacher beliefs and program implementation in one TWI school in a large, midwestern, urban district, and found that teachers would rely on their own experiences and beliefs rather than research or program design. The 12 teachers interviewed held beliefs that were consistent with Lindholm's Criteria for Effective Two-Way Immersion (cited as Crawford, 1991; cf. Lindholm, 1990). However, their practice did not always follow suit. Teachers noted both conflicting research on second language acquisition and prioritizing the mastery of academic content over learning a second language as reasons why they would often deviate from the strict separation of languages for instruction.

Lewis (2000) noted that in a newly implemented Texas TWI program, while Spanish teachers had fewer years of teaching experience overall, English teachers reported less experience with English language learners, and neither group had taught in an immersion program before. In the first year of implementation, the English teachers had a smoother transition to instructing NSS and NES students, while the Spanish teachers noted significant interpersonal tensions between the two groups of students. Teachers also noted that they were overwhelmed and intimidated by the amount of parental participation in the classroom, especially by native English-speaking parents.

A comparison of the third grade English TWI, Spanish TWI and mainstream teachers in a newly-implemented, midwestern TWI program exemplifies some of the patterns that emerge in the literature on two-way teaching (Sera, 2000). The English TWI teacher was very experienced and her classroom was highly interactive and student-centered. She felt positive about bilingualism and the program she taught in, although she had some reservations in its early stages of implementation. The Spanish TWI teacher was not a native-speaker of Spanish, and felt ill-

prepared by her teacher education program and not confident with her own Spanish abilities. Her teaching involved more use of an overhead projector and worksheets than that of the English TWI teacher. The mainstream teacher, who was also very experienced, ran a much more disciplined, teacher-fronted classroom, with a more "traditional" teaching and assessment style than the TWI teachers did.

Calderón's study (1995, 1996) focused on teacher development through peer ethnographies in two 50/50 two-way schools (Rivera and Rusk Elementary Schools) in El Paso, Texas. Each class was team-taught by a monolingual English speaker and a bilingual Spanish/English speaker, who alternated in teaching and facilitating group work, and who had relatively broad autonomy in their curriculum and class organization. In this study, teachers were observed in their classrooms and in their professional development activities. The teachers reported that team-teaching was a positive experience, enhancing their personal and professional growth. As part of their professional development, teachers observed each other through peer ethnographies and then analyzed and discussed the data in the Teachers Learning Community (TLC) sessions held one Wednesday a month. These ethnographies included information about curriculum, teaching practices, assessment and grading systems, and parental engagement strategies, and were a positive experience as they created a cycle of observation, analysis, reflection, readjustments, and continuous learning. Calderón (1999) reported that the peer ethnographies helped the teachers discuss issues such as the disparity in status of English and Spanish in the schools. She reported that a school that discontinued its TLC program was less successful in reconciling differences among the teachers and promoting cooperation, whereas the ongoing TLCs provided a more collaborating environment among the teachers. She concluded that collaboration, not only among teachers, but also among administrators and parents, is fundamental for the continued development and success of two-way programs.

Studies also revealed that some TWI teachers hold a personal stake in these programs. For example, the authors of a study of teachers in a Navajo/English TWI program in Arizona (Goodluck, Lockard, & Yazzie, 2000) noted that because of past suppression of the Navajo language, teachers saw the importance of their being language (and cultural) models, and in aiding the revitalization of Navajo in the community by incorporating experiential learning and parent/community involvement in the formal Navajo schooling of the students. Although working in Spanish/English programs has a different sociopolitical context, these teachers also have a great awareness of the social and linguistic ramifications of their particular schools. Participants in Freeman's (1994) study also expressed personal feelings of discrimination as linguistic minorities, and Freeman noted teachers' negative feeling toward students "abandoning the native language and cultural identity" (1994, p. 7). Likewise, the second grade teacher in Schauber's study "heralds the importance of bilingual education" and "believes that developing academic biliteracy and a positive self-image is crucial to [the students'] educational and personal success" (1995, p. 486).

Conclusion

The research on teacher experiences and professional development provides a fairly clear portrait of the perceived benefits of working in a TWI program, the motivations that TWI teachers share, and the challenges they face. Benefits include autonomy, the creativity of making new curricula

and assessments, team teaching, and the opportunity to use Spanish. Motivations include elevating the status of minority languages and the native speakers of those languages, and promoting greater participation among the parents of language-minority students. The challenges discussed by TWI teachers were numerous, and include the labor-intensive nature of the programs due to the need to do everything in two languages, the challenge of making content comprehensible to second language learners, scheduling, working with a team teacher, and interacting with parents on a regular basis, many of whom are perceived as being quite demanding. The research indicates that teachers appreciate ongoing professional development to help them with these challenges, such as the Teacher Learning Community (TLC) program that was presented in this section. Once again, the majority of studies in this section used qualitative research methods in a single program site. As was also the case in other sections, the one larger study reported here supported many of the findings of the smaller studies, lending overall strength to the common findings across studies.

PARENT ATTITUDES AND INVOLVEMENT

As is the case with any educational program, parent involvement in TWI is crucial to its success. Because of the integrated nature of TWI programs, they provide an interesting opportunity to look at the attitudes, goals, and concerns of two different groups of parents—parents of language-minority children and parents of language-majority children. The research reported here investigated these issues through the use of interviews, surveys, and observations.

Craig (1996) presented a case study of parents' attitudes towards bilingualism and their reasons for enrolling their children in an urban, East Coast TWI program. English-speaking and Spanish-speaking parents, who filled out a questionnaire in their native language, showed similar positive attitudes toward most aspects of bilingualism: a positive effect on cross-cultural attitudes and understanding, fair treatment in American society, more job opportunities, as well as the importance of English fluency. Spanish-speaking parents rated the importance of language maintenance higher than English-speaking parents, whose mean score was still well in the favorable range. In open-ended questions, the English-speaking parents mentioned cultural diversity as well as second language acquisition and future job opportunities as the primary benefits of two-way programs. A few English-speaking parents also mentioned the importance of maintaining heritage language and culture. For Spanish-speaking parents the major reasons for choosing a two-way program were maintaining language and cultural heritage and instilling ethnic pride in their children. They also cited enhanced future job prospects, and the importance of English language proficiency and appreciation of the U.S. culture. The results of the survey show positive attitudes toward bilingualism and cultural diversity, and that communities with different interests can be served by TWI programs.

Parchia's (2000) parent surveys of African American parents in two East Coast TWI schools reveal similar motivations to the English parents in Craig's study. The African American parents' primary concern was in finding a school that was racially integrated and would offer their children opportunities for future educational and financial success. Where they differ from other accounts of English-speaking parents' concerns is that they did not enroll their children in TWI programs because they were bilingual programs, but because they were known as good schools.

These parents did see exposure to Spanish as a benefit for their children's future employment possibilities.

Less than a third of parents of kindergartners in a northeast TWI program reported inter-cultural play outside of school, although 87% said that their children had made at least two friends from the opposite language group at school (Hausman-Kelly, 2001). Only a third of parents had cross-linguistic relationships before their involvement in the school, but as of the time of the survey, 55% had at least two friends who spoke another language. Both English and Spanish dominant parents cited instrumental and integrative motivations for enrolling their students in the TWI program, although only Spanish dominant and bilingual parents indicated maintenance of the home language as a motivation. More than 90% of parents reported satisfaction with the program academically and socially.

Among parents involved in the early stages of a Texas TWI program (Lewis, 2000), some NES parents were concerned that the NSS students would slow down the academic progress of their children. As in the other studies, NSS parents wanted their students to be integrated into the "mainstream" of American culture. Lewis also found that parental involvement in the program was seen as contingent on ongoing, meaningful communication among the staff and parents.

Based on a multiculturalism questionnaire given to parents of first through third graders in the Amigos program, as well as parents of NES mainstream students at the same grade levels, Cazabon, Lambert, and Hall (1993) found no difference in attitudes toward multiculturalism among the two groups. This would indicate that parents of TWI students were not more predisposed toward multiculturalism than mainstream parents; it should be noted, however, that this was based on a very small sample of parents.

In Lindholm-Leary's (2001) study of parental support and involvement, the findings showed that the lower the education level of the parents, the less support they perceived from the district. In general, parents of students in the 90/10 program with a higher poverty rate perceived less support from staff than parents from 90/10 programs with a lower poverty rate. Although all parents considered parent involvement to be important, those NES and bilingual parents with more education considered involvement to be more relevant. Concerning the attitudes toward bilingualism and the reason for enrolling their children in a kindergarten TWI program, parents differed slightly in their views. For all Hispanics, their motivation was mostly integrative (keeping heritage language and culture, being able to communicate with native Spanish speakers, etc.), whereas White parents mainly had instrumental motivation and attitudes toward the program (e.g., possibility of a better career, more job opportunities). All of the parents were satisfied with the program and would recommend it; Hispanic parents, however, were more satisfied than White parents, and parents in general were more satisfied at kindergarten and the upper grades (6-8) than at the intermediate grades (3-5).

Blanchette (1994) found that parents of students in a well-established 50/50 program in New York City had more positive feelings toward bilingualism and language learning than parents in the school's corresponding English-only (EO) program. She found that the two groups of parents had fairly comparable demographics with two exceptions: ethnicity (of the 75% of each group who did not identify as White, most of the TWI parents were Hispanic, while the EO parents

were split between African Americans and Hispanics) and language (more TWI parents were bilingual while more EO parents were monolingual in English, as were *their* parents). Which program their child was enrolled in had a stronger correlation with attitudes than any demographic criteria. TWI parents were more likely to see bilingualism as an advantage and feel positively toward the use of two languages while EO parents were more likely to support using only English in school and making English the national language of the U.S. Blanchette concluded that any positive feelings toward languages other than English were not linked to *action* among EO parents as they were among TWI parents, and that if EO parents felt any value toward learning a second language, they felt it was not worth the "risk" to their child's English and academic content development.

Another survey (Saucedo, 1997) conducted at an 80/20 school in Chicago found that nearly all of the parents (97%) had favorable attitudes toward their children learning a second language in school, and thought that being fluent in English and Spanish was important; 84% had materials in the child's second language at home. Of the 61 parents (whose native languages were not specified) who returned questionnaires, 97% were satisfied with their child's second language and academic development, and 95% were satisfied with their child's first language development. Most parents thought children from the two language groups could learn from each other (94%) and that cross-cultural attitudes are enhanced in TWI (98%); further, 95% of the parents thought the presence of English learners had enhanced their child's progress, and 89% thought the same of Spanish learners. Most (97%) of the parents supported parental involvement in the school, although only 53% had volunteered in their child's class.

Sera (2000) compared survey results of TWI and mainstream parents in a midwestern school. Predictably, TWI parents had more positive attitudes toward the Spanish language and bilingualism, and reported their children reading, writing, and speaking in a second language more than parents of mainstream students. There was no statistically significant difference in the level of school participation between the two groups of parents.

Continuing with the theme of volunteering, Zelazo (1995) examined parental involvement of 14 Spanish-speaking families and 13 English-speaking families in a TWI school. The randomly selected parents were interviewed and also observed in parent-teacher interactions. The authors found that:

- Parents' comfort with the staff and school personnel was essential for their involvement (this includes the use of the parents' native language by the staff);
- The involvement of the parents in different activities was related to the language used in those activities. For example, as meetings of the official parents' organizations were held in English, Spanish-speaking parents did not participate in them;
- Parent education and socioeconomic status were also related to school involvement. The higher education and social status the parents had, the more involved they were at the school.

In some cases, inflexible jobs, lack of transportation, and baby-sitting issues prevented some parents from spending time at the school. These are all issues that schools can and should act on

to encourage parental involvement, especially from language minorities. Schauber (1995) also noted that a school in Massachusetts did a poor job of communicating with native Spanish-speaking Hispanic parents, and consequently they were less involved at the school level than White parents. In contrast, Carrigo (2000) found that in a different Massachusetts program, teachers characterized parents as generally being involved and saw their involvement as an asset. They did note that some parents were resistant to Spanish, and were frustrated with their child's difficulty with Spanish homework and their inability to help.

Peña (1998) presented a case study of a K-8 public school in the Southwest in its shift from a transitional bilingual to a TWI program. The school was in a low-income, largely Hispanic, urban community. In response to low student performance, school administrators decided to adopt a TWI program to better serve the needs of the Mexican students. Although teachers/administrators and parents had similar philosophies toward schooling, there were conflicts between these two groups. The former were pressured to maintain the principles stated in the grant ("increased test scores," "bilingualism and biliteracy," and "social acceptance") and were driven by the idea that good educational practice would lead to academic improvement and upward mobility. The parents, in contrast, felt uncomfortable with and detached from the planning process, and felt that their ideals relating to "family values," such as learning, nurturing, and overcoming obstacles, were being ignored and devalued by the teachers and administration. In addition, the parents resented the emphasis of teachers and administrators on upward mobility, as it seemed to be an indictment of their child-rearing practices and culture. The author suggested that the difficulties may also have stemmed from teachers' and administrators' nervousness about a new program and desire for autonomy in decision-making. With both groups entrenched in their positions, the consequence was frustration and animosity between them. This case study demonstrated the need to implement dual-language programs with the support and cooperation of both school and parents.

Conclusion

In general, the studies reported in this section have found positive attitudes toward TWI programs on the part of the parents. NES parents tend to see the utilitarian advantages of participation in a TWI program (e.g., future job prospects) while NSS parents stress the desirability of maintaining the cultural and linguistic heritage. Both groups see the value of their children becoming bilingual and being educated in a culturally diverse setting. Two studies look at factors that affect parental participation, and both urge current and prospective TWI programs to be inclusive and to take steps to facilitate parental involvement, such as using both languages for meetings and taking cultural norms into consideration.

CONCLUSION

In many respects, the literature summarized in this review indicates that much is going well in two-way immersion education:

- There is general agreement on the definition, goals, and critical features of TWI programs, as these issues have been clearly and repeatedly articulated in various documents, and many portraits of successful programs refer to these elements.
- A number of successful programs have been profiled in the literature, which provides growing evidence for the feasibility of the model, as well as a roadmap for those who are interested in starting programs.
- There is evidence that TWI teachers are reasonably well-prepared in terms of education, experience, and credentialing, and that useful professional development models have been designed to further support their teaching in these challenging educational environments.
- TWI programs provide integrated educational environments where both languages and both groups of students are valued, and there are examples of many programs and teachers that have been successful at tapping into the background experiences of their students and making the curriculum more in line with students' experiences.
- Both students and their parents seem to have positive attitudes toward TWI education, and students also seem to have developed positive attitudes about bilingualism and multiculturalism through their participation in these programs.
- Student academic outcomes are generally favorable in that both language minority students and language majority students tend to do as well or better on standardized achievement tests than their peers who are educated in alternative educational settings, such as general education, ESL, or transitional bilingual programs. Moreover, both groups of students demonstrate progress toward the goals of bilingualism and biliteracy development.

A huge, cross-cutting issue that comes out of many of the studies reported here is equity, and the tension that arises between the ideal of two-way immersion and the reality of implementation in the United States, a monolingual English society. While practitioners, parents, and policymakers may embrace the ideals of equal status of the two languages and two language groups, similar achievement patterns for language minority and language majority students, and fully developed bilingualism and biliteracy for all students, many forces work against the full realization of these ideals. These forces include a lack of bilingual teachers and support staff; limited pedagogical materials in the minority languages, especially in the upper grades and for languages other than Spanish; the lower status of speakers of those languages in society in general; mandatory standardized achievement testing in English in the primary grades; and current political initiatives such as English-only and anti-bilingual education legislation. Much of the literature presented here documents the ways in which TWI programs struggle to work within the reality and approach the ideal, and the ways in which the reality impacts student outcomes, classroom discourse, instructional strategies, and attitudes of students and parents.

There are many areas that are ripe for research in the field of two-way immersion education. In terms of equity, it would be useful to investigate programs that have succeeded in achieving greater equity to learn more about how they have succeeded. At the program level, there is a need to learn more about differences in program models and how they impact student outcomes. Specifically, there are two features that need to be investigated more carefully—the amount of instruction in the minority language in the primary grades, and the approach to initial literacy instruction. At the student level, there is a need for more longitudinal research that tracks the development of bilingualism, biliteracy, and academic achievement over time and provides benchmarks of expected performance at key intervals, such as fifth grade or eighth grade.

In that same vein, more research is needed to find out about the long-term effects of TWI education—for example, whether or not TWI students have higher high-school graduation rates and college attendance rates than other students, and the extent to which they maintain and use the minority language in their careers. It would also be useful to look at the performance of varying groups of students in TWI programs, especially under-represented students such as African Americans. More research is also needed in instruction and assessment to learn more about what teachers need to know to work effectively in TWI classrooms, and how instructional strategies and assessments need to be modified to be effective and appropriate in TWI contexts. Finally, as is evident by the limited amount of literature on programs that use minority languages other than Spanish, a great deal needs to be learned about how to design and implement these TWI programs, especially when literacy involves a language with a different orthography from English. Clearly, much remains to be learned about two-way immersion education, and there is every indication that the need for this information will continue to grow as new programs begin and existing programs expand to the secondary level.

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