

Evaluating Dual Language Education Programs in Taiwan: Structure, Instruction, and Learning Outcomes

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Abstract

Despite the increasing popularity of dual language education programs in Taiwan, limited research assesses their effectiveness. This study evaluated eight English Immersion Programs (EIPs) in Taiwan, representing a dual language education model, using the *Guiding Principles for Dual Language Education (GPDLE)* framework. Interviews with the management team and a questionnaire for Native English Teachers (NETs) assessed the alignment of program structure and instruction with the *GPDLE*. A quasi-experimental design, including pre-tests and post-tests, examined the English listening and reading outcomes of 74 fourth to sixth-grade students in two randomly-selected EIPs over a year. The findings reveal that 83% of the EIPs fully adhered to the program structure outlined in the *GPDLE*, while only 33% of teacher instruction exhibited full alignment, with an additional 57% demonstrating partial alignment. Notably, significant improvements in reading were observed among fourth-grade students, and both reading and listening skills showed substantial enhancements in the fifth and sixth-grade students. The study recommends adopting a financially sustainable, user-paid model for an after-school English immersion program, supporting Taiwan's 2030 Bilingual National Initiative.

Keywords: English immersion program, dual language education, program structure, instruction, student learning outcomes

1. Introduction

Bilingual education, as defined by Garcia (2011), is an instructional approach that utilizes two languages as mediums for learning and instruction. The primary aim is not only to strengthen the student's first language (L1) but also to facilitate the effective learning of a second language (L2) or a foreign language (FL), ultimately achieving biliteracy and bilingualism. The overarching objectives include fostering an appreciation for diverse cultures and enhancing cross-cultural communication skills. Garcia (2011) outlines three central goals for bilingual education: grade-level academic achievement, bilingualism and biliteracy, and sociocultural competence, as illustrated in Figure 1. Experts in bilingual education, such as Genesee et al. (2006) and Lindholm-Leary and Genesee (2010), emphasize the necessity of adopting rigorous bilingual education theories and frameworks for successful programs. Teachers and administrative teams affirm that integrating these three core goals enhances the rigor of curriculum development, leading to significant learning outcomes (de Jong, 2011; Genesee et al., 2006; Lindholm-Leary & Genesee, 2010). This underscores the importance of Garcia's (2011) proposed goals as a fundamental theoretical framework for establishing and operating successful bilingual education programs.

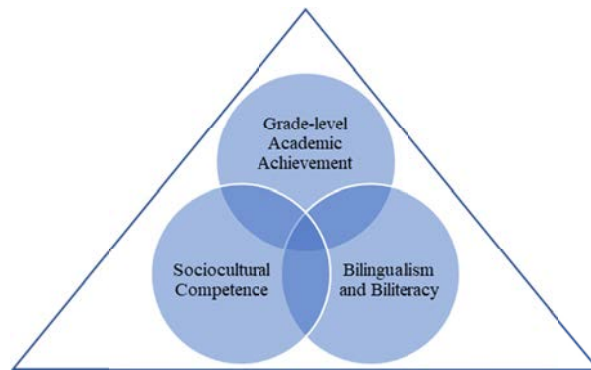


Figure 1. Three goals for bilingual education (Garcia, 2011)

However, the goals and strategies of bilingual education programs may vary (Christian, 2016). Some models prioritize language acquisition, while others (e.g., dual language education programs) aim for academic success in both languages (Howard et al., 2003). The classification of dual language education programs in the US includes one-way immersion, two-way immersion, and foreign/world language immersion, each catering to diverse language learning needs (Howard et al., 2018). Dual language education programs are crucial in achieving grade-level academic success, bilingualism, biliteracy, and sociocultural competence as they improve academic outcomes, enhance cognitive development, and increase social and cultural capital (Christian, 2011, 2016; Howard et al., 2018). Sustained and consistent dual language education is vital for promoting students' language proficiency and academic achievement in the long run (Howard et al., 2018; Steele et al., 2017; Umansky & Reardon, 2014). Despite the success of these programs, challenges persist in coordinating the curriculum and instruction across two languages (Howard et al., 2018; Murphy, 2016).

Practically, the success of implementing a dual education program is intricately linked with the management, typically embodied by the school principal (Herman et al., 2016). Effective leaders must possess a clear grasp of the curriculum and its objectives (Boscardin, 2005). Drago-Severson (2007) emphasizes the need for leaders to adapt organizational structures and implementation strategies based on objectives. This adaptation involves nurturing team synergy through professional development to actualize the overarching curriculum. Given the potential for leaders to change positions or undergo rotations, even the most well-designed curriculum is at risk of collapse if solely dependent on the efforts of leaders (Castellano, Stringfield, & Stone, 2002). Consequently, relying solely on leaders proves inadequate; the presence of an efficient support team with specialized roles becomes pivotal for success (Brooks et al., 2007). Nevertheless, Grivet et al. (2021) highlight a scarcity of literature delving into topics such as the management perspective on structures within dual language education programs.

Taiwan has witnessed a growing interest in English Immersion Programs (EIPs), a dual language education model, implemented by some private kindergartens or primary schools, with varying degrees of immersion and instruction by native or bilingual teachers (Chen, 2006). With instruction provided by either native English-speaking teachers or bilingual Taiwanese teachers, these programs are further divided into early total immersion typically from kindergarten or first grade, and partial immersion where instruction in both languages with varying emphasis on each language is provided. In pursuit of its goal to become a bilingual country by 2030, the Ministry of Education launched experimental EIPs for public primary and middle schools in 2018 (National Development Council, 2021).

Despite progress, concerns linger about the effectiveness of these programs and the readiness of Taiwanese teachers for content-based English instruction (The Language Training and Testing Center, 2021). In response, the Ministry of Education released a White Paper 2.0 advocating for content-based instruction in English in public primary and secondary schools (Ministry of Education, Taiwan, 2020). Notably, Fan (2020) proposes a dual language education approach with a gradual transition, considering teacher support and student composition, as a potential effective instructional model tailored to local needs. Given the limited research on the effectiveness of dual language education programs in Taiwan, this study aimed to evaluate the EIPs in eight public primary schools operating for over eight years, assessing their program structure, instruction, and effects on student learning outcomes over one year.

1.1 Relevant Scholarship

1.1.1 Success Factors of Effective Dual Language Education Programs

Effective dual language education programs share key characteristics that contribute to their success. Montecel and Danini (2002) identified these as a strong emphasis on bilingualism and biliteracy, high-quality instruction, a supportive school environment, and community engagement. Howard et al. (2018) emphasized the importance of a cohesive school-wide shared vision and goals focused on bilingualism, biliteracy, and sociocultural competence. Additionally, Genesee et al. (2006) found that a dual language education program based on sound theory and enriched instructional practices was more likely to yield successful outcomes. To ensure the sustainability of dual language immersion programs, Alanís and Rodríguez (2008) identified key factors, including strong leadership, teacher professional development, parental involvement, and ongoing assessment and evaluation. Herman et al. (2016) found that effective leadership interventions, such as professional development, coaching and mentoring, and restructuring of leadership roles, contribute to program success. Scholars also claim that incorporating students' home language in instruction is effective in promoting positive effects on students' language and academic development (August et al., 2014; August & Shanahan, 2006; Calderón et al., 2011; García et al., 2017; Genesee et al., 2006). Finally, Feinauer and Howard (2014) emphasized the importance of culturally responsive learning environments that value and validate students' linguistic and cultural backgrounds in developing dual language education programs.

1.1.2 Empirical Studies on Dual Language Education Programs

Empirical studies have demonstrated the numerous benefits of dual language education programs. For instance, researchers have highlighted the advantages of dual language instruction, including improved academic outcomes, bilingualism and biliteracy, and cross-cultural competence (Hamayan et al., 2013; Lindholm-Leary, 2012). Lindholm-Leary's (2016) study found that dual language education programs have a positive impact on students' language and academic development. Similarly, Steele et al. (2017) suggested that dual language immersion programs had a positive impact on academic achievement. Lindholm-Leary (2011) found that students in Chinese two-way immersion programs showed high levels of language proficiency in both English and Chinese, positive attitudes towards language learning, and high levels of motivation, engagement, and cultural awareness. Moreover, researchers found that increasing the amount of English or partner language in the instructional day leads to higher levels of proficiency and reading achievement in the respective language (August & Shanahan, 2006). However, research indicates that, for dual language education programs to have a significant impact on student outcomes, they must be implemented for at least 6 years to achieve native-like proficiency and grade-level achievement (Carroll & Bailey, 2015; Genesee et al., 2006; Umansky & Reardon, 2014).

Chen (2016) probed into partial English immersion programs in Taiwan and found that, while the programs had a positive impact on students' interest and motivation in learning English, some students might develop negative attitudes towards their native language and culture, highlighting the importance of parental involvement in promoting positive attitudes towards both languages and cultures. Feinauer and Howard (2014) explored the potential of two-way immersion programs in promoting cross-cultural competence and identity development. Lindholm-Leary (2016) found that students in dual language education programs (Spanish and Mandarin) had positive attitudes towards bilingualism, perceived themselves as becoming more bilingual over time, and experienced greater cultural awareness and identity. Gathercole (2016) identified various factors, such as age of acquisition, language exposure and use, language context, and individual cognitive abilities that can influence the development and maintenance of bilingual proficiency. Lastly, Gomez, et al.'s (2005) study focused on a dual language education model that used a 50-50 approach and showed that this model could be successful in promoting bilingualism and biliteracy and could lead to positive academic outcomes for students, including improved reading and writing skills in both languages.

1.1.3 Empirical Studies Using *Guiding Principles for Dual Language Education*

Empirical research using Howard et al.'s (2018) *Guiding Principles for Dual Language Education (GPDLE)* framework to evaluate the effectiveness of dual language education programs remains limited. Sun (2017) evaluated the teaching of four dual language education curricula (Spanish and English) in California, USA, based on the *GPDLE* framework. The teachers expressed the importance of developing strong foundational language skills, but faced challenges in creating teaching syllabi. Carzoli (2018) conducted a comparative analysis of four schools that offered a dual language immersion curriculum, utilizing the *GPDLE* Curriculum strand. The study revealed that all four schools not only met the *GPDLE* curriculum requirements but also delivered a rigorous program. Grivet et al. (2021) used the *GPDLE* strands to examine dual language education curricula (French and English) in Louisiana, USA, and found that academically superior schools had a clear division of labor in the

administrative team and received support from both internal teachers and the community, as well as connected with similar programs domestically and internationally.

The literature review identified crucial elements of successful dual language education programs and their positive impacts on student outcomes. It also reveals empirical studies that utilized the *GPDLE* framework. However, the literature lacks the evaluations of long-standing dual language education programs in Taiwan and the identification of factors contributing to their sustainability.

1.2 Study Purpose and Research Questions

This research aimed to evaluate the program structure and instructional practices of English Immersion Programs (EIPs) implemented in eight public primary schools in Taiwan, focusing on their alignment with the *GPDLE* developed by Howard et al. (2018). Additionally, the study investigated the impact of the EIPs on students' English listening and reading skills. The research questions were as follows:

RQ1: To what extent do the program structures of the eight EIPs in Taiwan align with the *GPDLE* Program Structure strand?

RQ2: How well do instructional practices in the eight EIPs in Taiwan align with the *GPDLE* Instruction strand?

RQ3: What is the observed impact of the EIPs on the English listening and reading skills of students in the studied primary schools?

2. Method

The study utilized purposive sampling to select eight public primary schools in Taiwan that offered EIPs to address the research questions. A mixed-methods approach was employed, incorporating qualitative interviews (n=5) with members of the program management team to assess the alignment of their program structure with the *GPDLE* Program Structure strand (Howard et al., 2018). Leadership perspectives were prioritized for a focused examination of organizational dimensions, aligning with Grivet et al.'s (2021) emphasis on the scarcity of literature on management perspectives within dual language education programs. For RQ2, a quantitative approach used a questionnaire based on the *GPDLE* Instruction strand, administered to all Native English Teachers (NETs) in the eight schools. The decision to focus on the NETs was due to their primary responsibility for delivering instructional content in the EIPs. Taiwanese English teachers were primarily engaged in classroom management support and did not directly deliver content. For RQ3, a quasi-experimental design with pre-tests and post-tests measured English listening and reading outcomes of two randomly-selected students over one year. The Test of English as a Foreign Language (TOEFL) Primary tests, recognized for assessing English communication skills in an international context, were chosen for alignment with the EIP learning objectives. Assessments were conducted in two representative schools due to budget constraints and resource considerations, ensuring a randomized approach for unbiased representation and maximizing research validity and reliability.

2.1 Research Context and Participants

The EIPs were initiated in 2013 in eight public primary schools in Taiwan by a non-profit organization. These programs aimed to develop bilingualism, biliteracy, and cross-cultural competence in students through a nearly 50:50 split of Chinese and English instruction, starting from Grade one. Notably, the EIPs were implemented after the mainstream Chinese-medium courses, with a gradual decrease in after-school instructional time in English from 50% to 30% for Grades Five and Six. As of 2022, these programs enrolled 878 students and employed 19 NETs and 42 Taiwanese English teachers.

2.1.1 The Management Team

The effective implementation of the EIPs was facilitated by a diverse management team led by a Director, overseeing program coordination with a visionary perspective on English immersion education. Comprising three full-time Program Leaders with administrative roles and hands-on teaching responsibilities, they contributed to curriculum development and ensured alignment with program goals. A part-time Supervisor, selected for administrative proficiency, actively engaged in teaching courses, providing valuable insights and support for program objectives. The collaborative efforts of this team, characterized by diverse roles and active teaching involvement, formed the cornerstone of the EIPs, fostering a conducive environment for successful bilingual education. Table 1 presents the roles of the management team and the selection criteria.

Table 1. Management team roles and selection criteria

Team Member	Role	Selection Criteria
Director	Overarching program coordination	- Vision for bilingual education - Extensive experience in education leadership
Program Leaders	Specific aspects of program execution	- Expertise in curriculum development and management - Demonstrated leadership in bilingual education
Supervisor	Insightful support and administration	- Administrative proficiency and experience - Ability to contribute to program goals and vision

2.1.2 Native English Teachers (NETs)

Nineteen qualified NETs, including 15 males and 4 females, with ages ranging from 21 to 50, taught in the eight public primary schools. Their English teaching experience varied from 6 to over 10 years. The majority, 42%, were from the UK, 32% from the US, with 84% holding a bachelor's degree. More than half had served in the EIPs for 0-5 years (53%).

2.1.3 Fourth to Sixth Graders in Two Randomly-Chosen Schools

To assess student learning outcomes, 74 students in grades four to six from two randomly selected schools underwent TOEFL Primary Reading and Listening Step 1 and 2 Tests. Of these, 50% (n=37) were in fourth grade, 36% (n=27) were in fifth grade, and 14% (n=10) were in sixth grade. The sample comprised of 34 male students (46%) and 40 female students (54%), with 70 students (95%) having been enrolled in the English immersion program for more than three years (continuous enrollment).

2.2 Research Procedures

Consent was obtained from the management team and the parents/guardians of the students before conducting the study. One-on-one, semi-structured interviews were conducted with the management team (n=5) and were recorded. Transcripts were sent to interviewees for member checking to increase the validity and reliability of the interview data (Horton & Martin, 2013). An anonymous questionnaire survey in electronic format was used to gather information on the instruction of 19 NETs in the EIPs, but only 17 valid responses were obtained, resulting in a response rate of 89.5%. TOEFL Primary Reading and Listening Tests were administered to 74 students in two randomly selected schools over one year, with pre-tests and post-tests conducted, as illustrated in Figure 2.

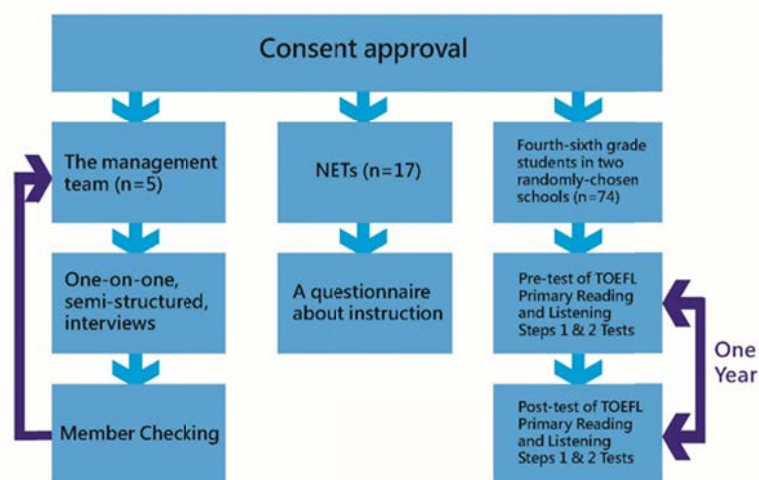


Figure 2. The research procedure

2.3 Instruments and Data Analyses

2.3.1 Interviews with the Management Team and Data Analyses

The *GPDLE* Program Structure strand, recognized for its comprehensive approach to dual language education, guided the evaluation of EIPs' program structure. Adopting 15 key points from this strand, one-on-one interviews

were conducted with the five-member EIPs' management team. The interviews, centered around the Program Structure strand, were transcribed and analyzed using Braun and Clarke's (2006) Deductive Thematic Analysis. Themes and subthemes related to the *GPDLE* Program Structure strand were identified. Evaluation was based on four progress indicators aligned with *GPDLE*'s practice levels: minimal, partial, full, and exemplary. The management team members were coded as M1-M5.

2.3.2 Questionnaire with the NETs and Data Analyses

The study utilized a survey instrument to assess the alignment of the NETs' instruction in the EIPs with the *GPDLE* Instruction strand. The questionnaire, comprising 21 questions, aligned with the 21 key points of the *GPDLE* Instruction strand, each rated on a 4-point Likert scale. Survey responses were scored from 3 to 0, and definitions of language learning pedagogy terms were provided for clarity. Data analyses included reporting the number and percentage of respondents for each question, along with mean and standard deviation scores. Four progress indicators, reflecting alignment levels from minimal to exemplary practice, were employed for evaluation, consistent with Howard et al. (2018). The survey demonstrated reliability with a Cronbach's alpha coefficient of 0.817.

2.3.3 Pre-tests and Post-tests for TOEFL Primary Listening and Reading Step 1 and 2 Tests

The study conducted TOEFL Primary Reading and Listening Tests for 74 students in two randomly selected schools over a one-year period, incorporating pre-tests and post-tests. These standardized English proficiency tests align with the EIP learning objectives, assessing English communication skills as an international language. Step 1 Tests were administered to fourth-grade students, and Step 2 Tests were given to fifth-grade and sixth-grade students. The tests demonstrated acceptable reliability coefficients (.83-.89). T-tests were employed to analyze within-group pre-test and post-test results and to compare scores between Step 1 and Step 2 Tests.

3. Results and Discussions

3.1 Program Structure of the EIPs as Evaluated by the *GPDLE* (RQ1)

3.1.1 Vision and Advocacy on Students' Bilingualism and Biliteracy

Bilingualism encompasses proficiency in listening, speaking, reading, and writing in both native and foreign languages, while bilingual literacy pertains to competence in literary, textual, or cultural aspects of both languages. The EIPs in this study were introduced to students starting from the first grade. In the lower grades, students received instruction in Mandarin Chinese and Math during regular hours, followed by participation in the EIPs for Language Arts and English enrichment courses, including Music, Art, and Physical Education. This schedule amounted to 14 courses per week (see Figure 3).

Grades one and two	Grades three and four	Grades five and six
Language Arts (9 periods, per week) -Phonics/Spelling/Vocabulary (4 periods, per week) -Listening/Speaking (4 periods, per week) -Reading/Writing (1 period, per week)	Language Arts (6 periods, per week) -Reading/Writing (2 periods, per week) -Listening/Speaking (2 periods, per week) -Grammar (2 periods, per week)	Language Arts (4 periods, per week) -Writing (2 period, per week) -Grammar (2 periods, per week)
English Enrichment Courses (5 periods, per week) -Art (2 periods, per week) -Music (2 periods, per week) -Physical Education (1 period, per week)	English Enrichment Courses (6 periods, per week) -Science (2 periods, per week) -Social Studies (3 periods, per week) -Physical Education (1 period, per week)	English Enrichment Courses (7 periods, per week) -Science (2 periods, per week) -Social Studies (4 periods, per week) -Physical Education (1 period, per week)

Figure 3. Curriculum framework across grades of the EIPs

The thematic analyses unveiled a robust alignment in the cohesive school-wide framework between mainstream Chinese-medium education and the EIPs. This alignment was evident in strategies advocating bilingualism and biliteracy among various stakeholders, including management, teachers, parents, and students. By the second grade, the majority of students demonstrated proficiency in communicating in English during daily classes, achieving "bilingualism" in both Mandarin Chinese and English by grades two to three. Notably, grades three

and four saw students receiving Science and Social Studies instruction in both mainstream Chinese-medium education and EIPs, facilitating the attainment of biliteracy in both languages (refer to Table 2). As a result, the EIPs were found to be in “full alignment” with the *GPDLE* Program Structure strand, effectively supporting students’ development of bilingualism and biliteracy.

Table 2. Coding and interview excerpt for program vision on bilingualism and biliteracy

Subtheme	Excerpt
Bilingualism and biliteracy	<i>“We have very clear goals for each courses both in Chinese and English immersion programs...Many students in the EIPs are able to develop bilingualism and biliteracy in both languages simultaneously.” (M1)</i>

3.1.2 Students’ Appropriate Grade-Level Academic Expectations and Development of Sociocultural Competence

Thematic analyses reveal that both mainstream Chinese-medium education and the EIPs had established grade-level academic expectations across all grades. Over the past eight years, the management team and the curriculum committee, which included the NETs in the EIPs, consistently evaluated and enhanced curricula. Consequently, the EIPs were in “full alignment” with the *GPDLE* Program Structure strand’s program design for appropriate grade-level academic expectations. Moreover, sociocultural competence, emphasizing cross-cultural sensitivity and a global perspective, was fostered through age-appropriate Social Studies content starting from the fourth grade. This approach aimed to develop students’ communicative, critical thinking, and cross-cultural skills, fostering global citizenship and sociocultural perspectives on global issues (see Table 3).

Table 3. Coding and interview excerpt for students’ development of sociocultural competence

Subtheme	Excerpt
Sociocultural competence	<i>“Among grade-level academic expectations, especially in the Social Studies, developing students’ social and cultural literacy is one of our key foci...students may be involved in topics or activities such as hands-on learning, discussions, projects, and simulations, etc., related to multiculturalism and international education, aiming to cultivate students’ cross-cultural communication skills and global perspectives.” (M2)</i>

In summary, the EIPs attained an 83% “full alignment” in Principle 1, encompassing grade-level academic achievement, bilingualism, biliteracy, and sociocultural competence. The alignment was complete in the first five key points, with “partial alignment” in key point 6. The management acknowledged the challenge of coordinating curricula, instruction, and assessment across Mandarin Chinese and English, citing limited resources and information. This aligns with prior research indicating that, while dual language education programs excel in academic achievement and bilingualism, coordinating curricula and instruction across languages poses challenges (Howard et al., 2018; Murphy, 2016).

3.1.3 Equal Access to the Program

Thematic analyses reveal that the EIPs nurtured inclusive environments, welcoming students from diverse backgrounds irrespective of their prior English proficiency. Operating within public primary schools, the management team actively advocated for linguistic, cultural, and socioeconomic equality. This commitment ensured equitable access to teaching resources for all students and instructors, maintaining a curriculum marked by consistency and high quality (see Table 4). Consequently, the EIPs were determined to be in “full alignment” with the program design for equal access under the *GPDLE* Program Structure strand.

In terms of financial sustainability, interview insights shed light on potential models for sustaining the EIPs. The management team, integral to these discussions, provided valuable perspectives on funding challenges and explored alternative models for the programs’ continued success. Over the years, they strategically implemented a “user-paid model” with affordable monthly fees, distinguishing it from many private language schools or elementary institutions. Interviewees highlighted the delicate balance achieved between ensuring affordability for parents and securing sustainable program funding.

Table 4. Coding and interview excerpt for equal access to the program

Subtheme	Excerpts
Equal access to the program	<i>“Every year, we enroll first-grade students... Everyone, regardless of their socio-economic or linguistic background, is welcome to apply for our programs.” (M5)</i>
	<i>“The management team have experienced NETs to customize and design teaching resources, like lecturing PowerPoints for all the courses..All NETs have access to the resources.” (M3)</i>

3.1.4 Strong and Effective Leadership

Thematic analyses revealed that the EIPs were overseen by the Director, three full-time Program Leaders, and one part-time Supervisor. The Director initiated and expanded the after-school English immersion programs eight years ago, playing a pivotal role in advocacy, school-wide support, curriculum development, staff management, and strategic leadership. If the Director is unavailable, Program Leaders, responsible for budget, resources, student assessment, and teaching operations, would assume leadership. The part-time Supervisor managed administration, operations, and instruction. All team members, with an English teaching background, actively engaged in teaching and demonstrated “full alignment” with the *GPDLE* Program Structure strand. This exhibits the significance of effective leadership, consistent with previous research highlighting its crucial role in the success of dual language education programs (Alanís & Rodríguez, 2008; Herman et al., 2016) and the importance of a clear division of labor in academically superior schools (Grivet et al., 2021).

3.1.5 Ongoing Program Planning, Implementation, and Evaluation

Effective planning processes are crucial for achieving program goals, such as promoting bilingualism, biliteracy, and sociocultural competence, and improving student achievement. Flexibility is essential, but decisions about modifications should be based on clear rationales, student outcomes, research, and best practices. Thematic analyses revealed that the EIPs’ curricula aligned with age-appropriate learning objectives and annual reviews to meet community needs. However, there’s a minimal alignment in implementing the curricula beyond primary school, potentially impacting long-term effectiveness, language proficiency, and academic achievement, as noted by Howard et al. (2018), Steele et al. (2017), and Umansky and Reardon (2014).

Table 5. Coding and interview excerpts for ongoing program planning, implementation, and evaluation

Subtheme	Excerpts
Ongoing program planning, implementation, and evaluation	<i>“The curriculum has academic expectations and competency indicators for each grade level, as well as clear teaching schedules and standards...Taiwanese teachers are also responsible for reporting whether the curriculum is being followed according to the schedule. The management team holds curriculum meetings annually to review the suitability of one to two subject curricula and how they can be modified.” (M2)</i>
	<i>“Every semester, the supervisor visits each school to observe classes and conduct teaching evaluations. If any issues are found, she will immediately communicate with the teaching staff and address the problems discovered during the classroom observations. She convenes curriculum meetings, inviting foreign teachers or group leaders to discuss and determine the direction for curriculum revision.” (M4)</i>

3.2 Instruction of the EIPs as Evaluated by the *GPDLE* (RQ2)

3.2.1 Use of Research-Based Teaching Methods

The descriptive statistics in Table 6 summarize responses from the 17 NETs on the implementation of Principle 1 within *GPDLE* Instruction. Principle 1 emphasizes using research-based dual language education methods for model fidelity. Over 90% of teachers demonstrated “full alignment” in aligning literacy instruction with program guidelines and faithfully implementing the curriculum (Item 1). Regarding consistent language separation and fostering high expectations for English use with provided scaffolds (Item 2), opinions varied, with 70.6% indicating “partial alignment.” In standards-based instruction (Item 3) and English language arts instruction (Item 4), the majority showed “full alignment.” A significant portion indicated “full alignment” in consistently promoting sociocultural competence (Item 5). Responses on alignment with the dual language education model in support services and specials (Item 6) had mixed results. However, all teachers (100%) indicated “full alignment” in applying diverse instructional techniques to support all students (Item 7). Mean scores reinforced overall alignment with Principle 1, with slight variations in agreement levels among specific components.

Table 6. Descriptive statistics for NETs' responses to principle 1 for GPDLE instruction (n=17)

Principle 1: Employ teaching methods grounded in research-based dual language education principles to maintain model fidelity.	Strongly Agree # (%)	Agree # (%)	Disagree # (%)	Strongly Disagree # (%)	Mean (S.D.)
Align literacy instruction with program guidelines and implement the curriculum faithfully	9(52.9%)	8(47%)	0	0	2.5(0.5)
Maintain consistent language separation, fostering high expectations for English use with provided scaffolds	8(47.1%)	4(23.5%)	5(29.4%)	0	2.2(0.9)
Deliver standards-based instruction in math, science, or social studies, aligning with the program model through various strategies for language and concept development	6(35.3%)	9(52.9%)	2(11.8%)	0	2.2(0.6)
Provide English language arts instruction aligned with program standards during instructional time	11(64.7%)	6(35.3%)	0	0	2.6(0.6)
Consistently promote sociocultural competence in instructional time	10(58.8%)	7(41.2%)	0	0	2.6(0.5)
Align support services and specials with dual language model in instruction	4(23.5%)	7(41.2%)	5(29.4%)	1(5.9%)	1.8(0.9)
Consistently apply diverse instructional techniques, including cooperative learning and flexible grouping, to support all students in my instruction	11(64.7%)	6(35.3%)	0	0	2.7(0.5)

Note. Strongly agree=3, Agree= 2, Disagree=1, Strongly Disagree=0.

3.2.2 Implementation of Strategies for Achieving the Three Core Goals of Dual Language Education

Table 7 summarizes responses from the 17 NETs on Principle 2 within *GPDLE* Instruction, focusing on instructional strategies supporting the core goals of dual language education. The teachers showed strong alignment, particularly in integrating English and content consistently across lessons (Item 8: 70.6% strongly agreeing, 29.4% agreeing) and employing diverse strategies to enhance students' grasp of academic English and concepts (Item 9: 64.7% agreed, 35.3% disagreed). Limited agreement was observed in integrating instructional connections between the Mandarin Chinese and English Immersion lessons (Item 10: 47.1% "partial alignment"). Cultivating metalinguistic and metacognitive skills (Item 11: 82.4% "full alignment") and fostering cross-linguistic connections through targeted strategies (Item 12: 76.5% "full alignment") demonstrated strong alignment. Discussing English language varieties and power differentials (Item 13: 88.2% agreed), promoting equitable student participation (Item 14: 70.6% strongly agreed), and fostering sociocultural competence (Item 15: 64.7% agreed) were also aligned. Overall, teachers showed a strong commitment to aligning instructional strategies with the core goals of dual language education, with some variations in specific components.

Table 7. Descriptive statistics for NETs' responses to principle 2 for *GPDLE* instruction (n=17)

Principle 2: Strategies support the three core goals of dual language education	Strongly Agree # (%)	Agree # (%)	Disagree # (%)	Strongly Disagree # (%)	Mean (S.D.)
Integrate English and content consistently across lessons, with a growing emphasis on content-based language arts instruction, possibly incorporating thematic elements	12(70.6%)	5(29.4%)	0	0	2.7(0.5)
Consistently employ diverse instructional strategies to enhance students' grasp of academic English and concepts, actively monitoring their understanding through various methods	6(35.3%)	11(64.7%)	0	0	2.4(0.5)
Integrate instructional connections between the Chinese program and IE lessons, incorporating discussions or complementary resources in both languages	1(5.9%)	7(41.2%)	5(29.4%)	4(23.5%)	1.3(0.9)
Systematically cultivate metalinguistic and metacognitive skills in my lessons	5(29.4%)	9(52.9%)	3(17.6%)	0	2.1(0.7)
Consistently foster cross-linguistic connections through targeted strategies like cognate awareness, bridging, and translanguaging	5(29.4%)	8(47.1%)	2(11.8%)	2(11.8%)	1.9(0.9)
Frequent discussions on English language varieties, analyzing power differentials at local and national levels, and considering language choices in various situations	8(47.1%)	7(41.2%)	2(11.8%)	0	2.4(0.7)

Consistently applying diverse strategies for equitable student participation during instructional time	12(70.6%)	5(29.4%)	0	0	2.7(0.6)
Employ diverse strategies for fostering sociocultural competence in all students during instructional time	4(23.5%)	7(41.2%)	6(35.3%)	0	1.9(0.8)

Note. Strongly agree=3, Agree= 2, Disagree=1, Strongly Disagree=0.

3.2.3 Student-Centered Instruction

Table 8 summarizes responses from the 17 NETs on Principle 3 within *GPDLE* Instruction, focusing on student-centered instruction. Teachers demonstrated a strong commitment to student-centered approaches. Using diverse active learning strategies for diverse learners (Item 16) received 76.5% agreement, with 41.2% strongly agreeing. Engaging students in meaningful activities for sustained English language use and academic vocabulary growth (Item 17) garnered strong agreement, with 88.2% of teachers agreeing. Grouping students with diverse backgrounds and proficiency levels to encourage linguistic turn-taking (Item 18) saw 88.2% agreement. Similarly, employing differentiated strategies to foster student independence and encouraging pursuit of individual interests (Item 19) received 88.2% agreement, with 52.9% strongly agreeing. These results highlight teachers' dedication to creating student-centered learning environments, emphasizing active learning and personalized approaches catering to diverse student needs.

Table 8. Descriptive statistics for NETs' responses to principle 3 for *GPDLE* instruction (n=17)

Principle 3: Student-centered instruction	Strongly Agree # (%)	Agree # (%)	Disagree # (%)	Strongly Disagree # (%)	Mean (S.D.)
Employ diverse active learning strategies for diverse learners	7(41.2%)	6(35.3%)	2(11.8%)	2(11.8%)	2.1(1)
Engage students regularly in meaningful activities, fostering sustained English language use and academic vocabulary growth	5(29.4%)	10(58.8%)	2(11.8%)	0	2.2(0.6)
Group students with diverse backgrounds and proficiency levels to encourage linguistic turn-taking and reciprocal learning among peers	8(47.1%)	7(41.2%)	2(11.8%)	0	2.4(0.7)
Employ differentiated strategies to foster student independence, encouraging pursuit of individual interests with supportive classroom management	9(52.9%)	6(35.3%)	1(5.9%)	1(5.9%)	2.4(0.8)

Note. Strongly agree=3, Agree= 2, Disagree=1, Strongly Disagree=0.

3.2.4 The Integration of Technology in Instruction

Table 9 summarizes responses from the 17 NETs on Principle 4 within *GPDLE* Instruction, focusing on the effective integration of technology. Results indicate strong endorsement of technology integration. For the statement on frequent and appropriate use of technology tools to engage all learners (Item 20), a significant majority (70.6%) strongly agreed, with 29.4% in agreement. Regarding students using technology to showcase understanding and enhance English language skills (Item 21), 35.3% agreed, with 5.9% strongly agreeing. However, 47.1% disagreed with this statement. Overall, teachers exhibited a positive disposition toward incorporating technology in instructional strategies.

Table 9. Descriptive statistics for NETs' responses to principle 4 for *GPDLE* instruction (n=17)

Principle 4: Effective integration of technology to enhance students' learning process	Strongly Agree # (%)	Agree # (%)	Disagree # (%)	Strongly Disagree # (%)	Mean (S.D.)
Frequent and appropriate use of technology tools to engage all learners	12(70.6%)	5(29.4%)	0	0	2.7(0.6)
Students often use technology to showcase their understanding and enhance English language skills.	1(5.9%)	5(29.4%)	8(47.1%)	3(17.6%)	1.2(0.8)

Note. Strongly agree=3, Agree= 2, Disagree=1, Strongly Disagree=0.

In the EIPs, "full alignment" was achieved in key points of Principles 1, 2, and 4, with "partial alignment" in

others. For Principle 3, there was “partial alignment” across all key points. Challenges for the NETs included understanding Taiwan’s 12-year education program, incorporating student technology use, and addressing various instructional aspects. These findings highlight the inherent complexity in dual language education, as teachers balanced multiple goals. Professional development for teachers in dual language education programs is crucial, as recognized by Howard et al. (2018) and Hamayan, Genesee, and Cloud (2013). Overall, the instruction achieved 33% “full alignment” and 57% “partial alignment” with the *GPDLE* Instruction strand (4 principles, 21 key points).

3.3 Student Learning Outcomes in Listening and Reading (RQ3)

The TOEFL Primary Tests’ scoring system, as outlined in the Handbook (Educational Testing Service, 2019), converts the number of correct answers into a scale score ranging from 100 to 115, increasing by one point at a time. Step 1 scale scores range from 101 to 109, and Step 2 scores range from 104 to 115. Table 10 presents the within-group pre-test and post-test results for TOEFL Primary English Reading and Listening Step 1 and Step 2 Tests over one year.

Table 10. Within-group pre-test and post-test results for TOEFL primary steps 1 & 2 tests

TOEFL Primary	Mean		SD		<i>t</i>	<i>p</i>
	Pre-test	Post-test	Pre-test	Post-test		
<i>Step 1 English Reading (N=37)</i>	106.757	107.324	2.521	2.001	-2.147	.039*
<i>Step 1 English Listening (N=37)</i>	108.027	108.135	1.343	1.206	-.511	.612
<i>Step 2 English Reading (N=37)</i>	108.867	109.487	2.335	2.694	-2.625	.013*
<i>Step 2 English Listening (N=37)</i>	110.703	111.568	2.284	2.076	-3.120	.004*

Note. Significance of $p < .05$ is indicated by an asterisk (*).

The results for fourth-grade students indicated a significant improvement in reading ($t = -2.147, p = .039$), while listening scores did not show a statistically significant improvement ($t = -.511, p > .05$). In contrast, for fifth- and sixth-grade students, both listening ($t = -2.625, p = .013$) and reading ($t = -3.120, p = .004$) pre-test and post-test results exhibited a significant improvement. These findings align with the idea that an increased amount of English or partner language in the instructional day correlates with higher proficiency and reading achievement in that language (August & Shanahan, 2006). Additionally, the results are consistent with Gomez, Freeman, and Freeman’s (2005) findings, suggesting that the 50:50 educational model could effectively promote bilingualism and biliteracy, leading to positive academic outcomes, including improved reading skills in both languages. The study further supports prior research indicating that the benefits of dual language education may take up to six years to manifest (Carroll & Bailey, 2015; Genesee et al., 2006; Umansky & Reardon, 2014). The concept of the “bilingual advantage,” proposing improvements in cognitive and linguistic abilities for better academic performance, acknowledges that the timeline for these benefits can vary based on factors such as age, language proficiency, and the intensity and duration of bilingual education.

4. Conclusion

This study recommends implementing viable after-school English immersion programs to support Taiwan’s National Bilingualism Movement of 2030, based on the effectiveness observed in the eight-year EIPs in Taiwan. The key recommendations are as follows:

- 1) Partial after-school English immersion: The study highlighted the success of a partial, after-school English Immersion Program, particularly beneficial for the fifth and sixth-grade students. It emphasized the critical role of sustained exposure from Grade one for optimal dual language education benefits.
- 2) User-paid model: A user-paid model with an affordable fee structure for parents was recommended to ensure the widespread expansion and sustainability of the EIPs. This approach provided a stable financial foundation for ongoing operations, reducing the risk of program suspension due to financial constraints. Consideration should be given to targeted subsidies for disadvantaged students to promote equitable access.
- 3) Targeted training for Native English Teachers (NETs): Addressing challenges identified by the NETs in the questionnaire required targeted training and professional development opportunities. Encouraging collaboration, communication, and a culture of innovation in teaching and learning were also recommended.

While acknowledging study limitations, including restricted generalizability and a modest sample size, future research should explore various factors influencing the effectiveness of EIPs, assess the development of different

English skills, and address implementation challenges. Additionally, future studies could incorporate side-by-side assessments of both languages for a more comprehensive evaluation of EIPs' effectiveness.

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Authors contributions

Cheng-Ji Lai conceived and designed the study, collected and analyzed the data, drafted the manuscript, and revised it for intellectual content. Cheng-Ji Lai approved the final version of the manuscript.

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