

A Management Perspective on Academic Achievement: The Impact of Bilingual Education Policies in Chinese Primary Schools

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Abstract

This study investigates the impact of bilingual education policies on academic achievement in Chinese primary schools, addressing the growing need for effective educational strategies in increasingly diverse classrooms. Despite the recognition of bilingual education's potential, challenges persist in its implementation, particularly concerning student performance and program effectiveness. The primary objectives of this research to evaluate the correlation between bilingual education policy implementation and student academic outcomes, identify effective management strategies, and compare performance across different demographic and regional contexts. Utilizing a mixed-methods approach, the study combined quantitative analysis of standardized test scores, GPAs, and language proficiency assessments with qualitative insights from interviews and focus groups with educators, students, and parents. The findings revealed that students in bilingual education programs significantly outperformed their monolingual peers, with mean scores indicating substantial academic benefits. Key management strategies identified included continuous professional development, collaborative teaching, active community engagement, and data-driven decision-making. Comparative analysis highlighted performance disparities based on school demographics, showing that urban schools had better outcomes than rural schools, influenced by regional policies supporting bilingual education.

Keywords: Bilingual Education, Chinese Educational Policies, Academic Achievement, Language Proficiency, Educational Strategies

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1. Introduction

A. Overview of Bilingual Education in China

Bilingual education in China has gained significant momentum in recent years due to the country's rapid economic growth and increasing global integration. This educational model typically involves using Mandarin Chinese alongside a foreign language, predominantly English, as mediums of instruction. The origins of bilingual education in China can be traced back to the late 20th century, particularly after the 1978 open-door policy, which facilitated modernization and international engagement. Traditionally, English instruction focused on grammar and vocabulary

rather than practical communication skills, leading to dissatisfaction among learners who struggled to apply their knowledge in real-life situations. In response to these challenges, the Chinese government began reforming its language education policies, drawing inspiration from successful bilingual models in countries like Canada and the United States (Gao and Ren 2019). The Ministry of Education (MOE) has been instrumental in promoting bilingual education, issuing guidelines in 2005 to enhance English teaching in universities and emphasizing the importance of practical communication skills. More recently, a 2021 amendment to the education law mandated the implementation of bilingual education in ethnic autonomous regions, incorporating indigenous languages alongside Mandarin to address the educational needs of minority groups. Despite the increasing focus on bilingual education, its implementation varies widely across different regions and educational contexts in China. Research suggests that while many learners have positive attitudes toward bilingual education, challenges persist regarding teacher training, resource availability, and curriculum development. Studies indicate that the effectiveness of these programs is often limited by a lack of standardized practices and inadequate support for educators (Hu 2008). There is a pressing need for comprehensive research to examine the experiences of both learners and teachers within these programs and their overall impact on academic achievement. The COVID-19 pandemic has further complicated bilingual education in China, as the shift to online learning exposed disparities in access to resources and technology, particularly in rural areas with inadequate educational infrastructure. This situation raises concerns about the equitable implementation of bilingual education and its potential to exacerbate existing educational inequalities (Gao 2022).

B. Importance of Academic Achievement in the Context of Globalization

In an interconnected world, academic achievement is a critical focus for educational systems globally. As countries strive for economic growth and technological advancement, producing a skilled workforce is essential. Academic success serves as a key indicator of an individual's potential contributions to society, prompting educational institutions to prioritize effective teaching strategies. Globalization has emphasized multilingualism and cross-cultural competencies, making bilingual education vital for equipping students with the skills needed to navigate a complex global environment. Proficiency in multiple languages enhances communication and fosters cultural awareness, both of which are essential for effective collaboration in diverse settings (Pérez Gracia, Serrano Rodríguez and Carpio 2020). Additionally, research suggests that academic achievement in bilingual education correlates with improved cognitive outcomes, including enhanced problem-solving skills and critical thinking abilities compared to monolingual peers (Baker 2011). In China, the drive for academic excellence aligns with the country's aspirations to become a global leader in technology, science, and business. The Chinese government acknowledges that a strong educational foundation is crucial for achieving these goals. Consequently, bilingual education is viewed as a strategic approach to boost academic performance and prepare students for future global challenges (Gao 2022). However, challenges persist in the pursuit of academic success through bilingual education. The effectiveness of bilingual programs is influenced by factors such as socioeconomic status, access to quality resources, and the overall educational environment.

Students from disadvantaged backgrounds may encounter barriers that hinder their academic success, even within bilingual programs (Romero 2023). Addressing these disparities is essential for ensuring that all students benefit from bilingual education. In summary, the intersection of bilingual education and academic achievement in China is complex. As the country navigates the challenges of globalization, understanding the impact of bilingual education policies on academic outcomes is crucial for developing effective educational strategies. By fostering a supportive environment for bilingual education, China can enhance student performance and better prepare for success in an interconnected world. Bilingual education in China has gained traction due to rapid economic development and increased global integration. This model typically involves using Mandarin alongside a foreign language, most commonly English. The rise of bilingual education can be traced back to the late 20th century, particularly after the 1978 open-door policy, which marked a shift toward modernization. Historically, English was taught primarily through grammar and vocabulary, leading to dissatisfaction among learners who struggled with practical communication. In response, the Chinese government began reforming language education policies, influenced by successful bilingual models from countries like Canada and the U.S. (Gao and Ren 2019). The Ministry of Education (MOE) has played a key role in promoting bilingual education. In 2005, the MOE issued guidelines to improve English teaching in universities, emphasizing practical communication skills. More recently, a 2021 amendment mandated bilingual education in ethnic autonomous regions, incorporating indigenous languages alongside Mandarin to support minority groups (Gao and Ren 2019). Despite the growing emphasis on bilingual education, implementation varies significantly across regions. While many learners have positive attitudes toward bilingual education, challenges remain regarding teacher training, resource availability, and curriculum development. Studies indicate that the effectiveness of these programs is often hindered by a lack of standardized practices and insufficient support for educators. Thus, comprehensive research is needed to examine the experiences of learners and teachers and the overall impact on academic achievement. The COVID-19 pandemic has further complicated bilingual education by highlighting disparities in resource access, particularly in rural areas with inadequate infrastructure. This situation raises concerns about equitable implementation and the potential exacerbation of existing educational inequalities (Sun, Marks et al. 2023).

C. Importance of Academic Achievement in the Context of Globalization

In an increasingly interconnected world, academic achievement has become a critical focus for educational systems globally. As countries compete for economic growth and technological advancement, the ability to produce a skilled and knowledgeable workforce is paramount. Academic success is often viewed as a key indicator of an individual's potential to contribute to society and the economy, making it essential for educational institutions to prioritize effective teaching and learning strategies. Globalization has transformed the landscape of education, leading to a greater emphasis on multilingualism and cross-cultural competencies. In this context, bilingual education plays a crucial role in equipping students with the necessary skills to navigate an increasingly complex global environment. Proficiency in multiple languages not only enhances

communication abilities but also fosters cultural awareness and sensitivity, which are essential for effective collaboration in diverse settings (Tomyuk, Dyachkova et al. 2019).

Moreover, academic achievement in bilingual education settings has been linked to improved cognitive outcomes. Research suggests that bilingual individuals often demonstrate enhanced problem-solving skills, creativity, and critical thinking abilities compared to their monolingual peers. These cognitive advantages are particularly relevant in a globalized economy, where innovation and adaptability are highly valued (Baker 2011).

In China, the push for academic excellence is further fueled by the country's aspirations to become a global leader in various fields, including technology, science, and business. The Chinese government has recognized that fostering a strong educational foundation is essential for achieving these goals. Consequently, bilingual education is seen as a strategic approach to enhance students' academic performance and prepare them for future challenges in a globalized world (Gao and Ren 2019).

However, the pursuit of academic achievement through bilingual education is not without its challenges. The effectiveness of bilingual programs can be influenced by various factors, including socioeconomic status, access to quality resources, and the overall educational environment. For instance, students from disadvantaged backgrounds may face additional barriers that hinder their academic success, despite being enrolled in bilingual programs (Romero 2023).

The research problem addressed in the study focuses on the effectiveness of bilingual education policies in China and their implications for academic achievement. Despite the growing emphasis on bilingual education to enhance language skills and cognitive abilities, there is a significant gap in understanding their practical implementation and impact on student outcomes. Key issues include the uneven implementation of bilingual programs across different regions, inadequate teacher training and support, a lack of documented relationships between bilingual education and academic achievement in non-language subjects, and limited research on effective management strategies for optimizing these programs. The study aims to explore these dimensions to provide insights that can improve the management of bilingual education policies and enhance academic success in Chinese primary schools.

The study aims to develop and recommend effective management strategies for implementing bilingual education policies in Chinese primary schools to enhance academic achievement and address regional disparities in educational quality. It has two main objectives: first, to analyze the impact of bilingual education policies on students' academic performance by assessing academic outcomes, conducting longitudinal analyses, considering contextual factors, exploring comparative case studies, and gathering student perspectives. Second, the study seeks to explore managerial strategies that optimize these policies, focusing on leadership styles, professional development for teachers, resource allocation, community engagement, monitoring and evaluation practices, and aligning school management with broader educational policies.

2. Literature Review and Related Studies

The theory of bilingualism encompasses various models that elucidate how individuals acquire and utilize two languages. Among these, the additive bilingualism model is particularly significant, positing that the acquisition of a second language can enhance, rather than diminish, proficiency in the first language and overall cognitive development. This model stands in contrast to the subtractive bilingualism model, which suggests that learning a second language may lead to a decline in the first language's proficiency. Research has shown that additive bilingualism is linked to positive academic outcomes, as it fosters a deeper understanding of language structures and cultural nuances (Abutalebi, Guidi et al. 2015). For instance, studies have indicated that bilingual children often outperform their monolingual peers in various cognitive tasks, suggesting that bilingualism can enhance cognitive flexibility and executive functions (Ali 2023). In the context of Chinese primary schools, understanding the dynamics of bilingualism is crucial for developing effective educational policies that support both language acquisition and academic achievement. The integration of these theoretical perspectives into the study of bilingual education policies in China provides a comprehensive framework for understanding how these policies can be designed and implemented to maximize academic success. For example, policies that promote collaborative learning environments, provide adequate teacher training, and involve families and communities in the educational process are likely to yield better academic outcomes (Yan 2024). Furthermore, recognizing the cognitive benefits of bilingualism can help justify the allocation of resources towards bilingual education initiatives, as these programs not only support language development but also enhance overall cognitive skills (Bak, Nissan et al. 2014). Moreover, the importance of sociocultural factors in bilingual education cannot be overstated. Research indicates that the cognitive advantages associated with bilingualism are often influenced by demographic factors such as age, gender, and socioeconomic status (Chiedu and Jirandeh 2024). By acknowledging these factors, educators and policymakers can create more effective bilingual education programs that cater to the diverse needs of students. For instance, studies have shown that balanced bilingualism—where students have equal proficiency in both languages—correlates with enhanced cognitive functions, thereby supporting the additive bilingualism model (Thomas-Sunesson, Hakuta and Bialystok 2018). This understanding underscores the necessity for tailored educational strategies that recognize the unique linguistic and cultural backgrounds of students, ultimately fostering an environment conducive to both language and cognitive development.

A. Bilingual Education Policies in China

Bilingual education in China has evolved significantly since the late 20th century, particularly following the economic reforms initiated in 1978. The open-door policy led to increased globalization and a recognition of the importance of English as a second language. Initially, English was taught primarily as a subject, with a focus on grammar and vocabulary rather than practical communication skills. This approach resulted in widespread dissatisfaction among learners, who found it challenging to apply their knowledge in real-life contexts (Sun 2024). The influence of international bilingual education models, such as immersion programs in Canada and dual-language education in the United States, prompted China to adapt its bilingual education strategies. In 2005, the Ministry of Education (MOE) called for reforms in English language

teaching at the university level, emphasizing the need for improved communication skills among students ((MOE) 2005). By 2021, the MOE amended the education law to mandate the use of indigenous languages in bilingual education programs within ethnic autonomous regions, reflecting a commitment to preserving minority languages while promoting bilingualism (Gao and Ren 2019).

B. Current Policy Frameworks

The current framework for bilingual education in China is characterized by a dual focus on promoting Mandarin Chinese and foreign languages, primarily English. The MOE has established guidelines that encourage the development of bilingual programs across various educational levels, particularly in regions with significant ethnic minority populations. These policies aim to enhance students' language proficiency and intercultural communication skills, aligning with China's broader goals of internationalization and economic development (Zhang 2017). Recent policies emphasize the importance of integrating bilingual education into the national curriculum. For instance, the "National Medium- and Long-Term Educational Reform and Development Plan (2010-2020)" outlines strategies for improving language education, including the promotion of bilingual teaching methods and the training of qualified bilingual educators ((MOE) 2005). Furthermore, the "Belt and Road Initiative," launched in 2013, has also influenced language education policies, as it seeks to enhance China's global connectivity and necessitates a workforce proficient in multiple languages (Zhang, Xiao and Zaripbekovna 2024).

C. Academic Achievement Metrics

Academic achievement is a multifaceted construct that encompasses the extent to which students meet their educational goals, often quantified through metrics such as grades, standardized test scores, and overall performance in academic subjects. These metrics serve as indicators of a student's knowledge, skills, and competencies, facilitating comparisons across diverse educational contexts and populations (Graham and Yeh 2023). Standardized assessments, designed to measure students' knowledge and skills consistently, often include various formats such as multiple-choice questions, essays, and performance tasks, which collectively evaluate a range of competencies (Ashton and Hirano 2021). Additionally, grade point average (GPA) serves as a cumulative measure of academic performance, calculated based on course grades over time, thus providing a straightforward metric for assessing overall achievement (Vanegas 2019). Classroom assessments, including formative and summative evaluations such as quizzes and projects, contribute to a more holistic understanding of a student's academic capabilities (Ware, Kirkovski and Lum 2020). Longitudinal studies tracking academic performance over time further enable researchers to analyze trends and the impact of educational interventions on student achievement (García-Centeno, de Pablos Escobar et al. 2020). Recent research has increasingly focused on the relationship between bilingual education and academic achievement, revealing that bilingual programs can positively influence students' academic outcomes. For instance, bilingual education is associated with enhanced cognitive skills, including improved executive function and problem-solving abilities.(Ndyali and Shan 2019) found that bilingual students often outperform their

monolingual peers in tasks requiring cognitive flexibility and attentional control. Furthermore, studies indicate that bilingual education can lead to higher proficiency levels in both the native and second languages. (Ball, Curran et al. 2022) demonstrated that students in bilingual programs showed significant gains in both English and their heritage language, which positively correlated with their overall academic performance. A meta-analysis by Thomas and Collier Parra et al. (Thomas and Collier 2002) revealed that bilingual education students had higher standardized test scores in reading and math, particularly within diverse and economically disadvantaged populations. Additionally, bilingual education fosters social and emotional development, with students in such programs often exhibiting greater cultural awareness and empathy, enhancing their overall educational experience (Cheung, Kan et al. 2019). However, the effectiveness of bilingual education programs can vary significantly based on several implementation factors, including teacher training, curriculum design, and community involvement. Genesee Arteagoitia & Yen (Arteagoitia and Yen 2020) emphasizes the importance of well-structured bilingual programs that provide adequate support for both students and educators to maximize academic outcomes. For instance, research by (Ashton and Hirano 2021) highlights that increased exposure to bilingual programs enhances metalinguistic development and cognitive abilities, although participants sometimes struggle to articulate the benefits beyond language proficiency. Moreover, the role of educational policy and teacher identity is crucial in shaping the effectiveness of bilingual education, as noted by Huang (Anjarini, Nirmala and Kepirianto 2020), who discusses the interplay of language policy and teacher preparedness in influencing student outcomes. Collectively, these studies underscore the multifaceted benefits of bilingual education, suggesting that it plays a critical role in enhancing academic achievement while promoting cognitive, social, and emotional development among students.

D. Related Studies

The literature on bilingual education in China indicates a growing recognition of its potential to enhance academic achievement. (Huang 2019) conducted a comprehensive review that synthesized various studies, revealing a positive correlation between bilingual education and improved language skills among students. This review highlights the necessity of addressing implementation challenges, such as teacher preparedness and resource allocation, to fully realize the benefits of bilingual instruction. (Ramírez-Verdugo 2024) underscores the critical role of teacher training in the efficacy of bilingual education programs. The study identifies existing gaps in teacher preparation, advocating for targeted professional development initiatives that equip educators with the necessary skills for effective bilingual instruction. By enhancing teacher competencies, the potential for improved student outcomes in bilingual settings becomes more achievable, suggesting that comprehensive training is essential for the success of these programs. In addition, (Lindholm-Leary and Howard 2008) provides a broader theoretical framework for understanding bilingual education models, including immersion and dual-language programs. This overview not only assesses their effectiveness in promoting cognitive development and academic achievement but also emphasizes the implications for educational practice and policy. Such insights are particularly relevant for Chinese educators and policymakers seeking to enhance

bilingual education practices within their context. The role of educational leadership is further addressed by (Zhang 2023), who explores how effective leadership can facilitate the successful implementation of bilingual education policies in primary schools. The case study identifies specific leadership styles and strategies that positively influence teacher motivation and student engagement, linking these factors to improved academic performance. This underscores the importance of strategic management in fostering an environment conducive to bilingual education. Moreover, (Gao and Ren 2019) focus specifically on the impact of bilingual education policies on minority students in China. Their findings indicate that while these policies can enhance academic achievement, they also need to be tailored to address the unique cultural and educational needs of minority populations. Effective school management practices are crucial in ensuring equitable access to quality bilingual education for all students. Research by Zhang and Tsung (Zhang and Tsung 2019) further emphasizes the challenges of implementing bilingual education in rural areas of China, where resources are often scarce. Their analysis reveals that effective management strategies can help overcome obstacles related to teacher training and curriculum development. By identifying and implementing these strategies, schools can foster better academic outcomes for students in bilingual programs, highlighting the significance of local context in management practices. (Zhang, Lau and Su 2023) explore the influence of parental involvement on student achievement in bilingual education settings. Their study shows that active parental engagement significantly boosts student outcomes, suggesting that schools should cultivate strong partnerships with families. This finding has important implications for school management, as fostering parental involvement can enhance the overall effectiveness of bilingual education initiatives. (Cárdenas Curiel, Ojha et al. 2024) provides a critical policy analysis that examines the frameworks governing bilingual education in China. Their research assesses the effectiveness of current policies and identifies challenges for school management. They offer recommendations for aligning school practices with policy goals, emphasizing that coherent management approaches are vital for enhancing academic achievement in bilingual education. (Graham and Yeh 2023) investigates the challenges faced by school administrators in implementing bilingual education policies. The study reveals a range of obstacles, including insufficient training, resource limitations, and varying levels of community support. It highlights the need for strategic management solutions that address these challenges, ultimately aiming to improve educational outcomes in bilingual settings. These studies illustrate the multifaceted nature of bilingual education in China, emphasizing the critical role of management practices in enhancing academic achievement. They highlight the need for targeted teacher training, effective leadership, parental involvement, and coherent policy alignment to ensure the successful implementation of bilingual education initiatives.

3. Research Methodology

The research methodology outlines the systematic approach to investigating the impact of bilingual education policies on academic achievement in Chinese primary schools. This section will detail the research design, data collection methods, sampling strategy, and data analysis techniques employed in the study.

A. Research Design

This study utilized a mixed-methods research design, combining quantitative and qualitative approaches to provide a comprehensive understanding of the research questions. The quantitative component involved a quasi-experimental design, allowing for the comparison of academic outcomes between students in bilingual education programs and those in monolingual environments. The qualitative component consisted of case studies and interviews to gain deeper insights into the experiences of students, teachers, and administrators regarding bilingual education policies. Quasi-Experimental design involved selecting schools that have implemented bilingual education policies and comparing academic achievement metrics (e.g., standardized test scores, GPA) against schools that have not adopted such policies. This approach enables the identification of causal relationships while controlling for confounding variables. Case Studies and Interviews focused on selected schools known for effective bilingual education implementation. In-depth interviews with educators, students, and parents provides qualitative data to complement the quantitative findings, exploring perceptions, challenges, and successes associated with bilingual education.

B. Data Collection

Data collection involved Quantitative and Qualitative Data Collection to ensure a rich dataset that captures both quantitative and qualitative dimensions of the study. In quantitative data collection the academic performance metrics test scores and GPAs are collected from school records for both bilingual and monolingual students. This data obtained from the participating schools, ensuring that all ethical considerations regarding student privacy are addressed. Moreover, demographic Information such as age, gender, socio-economic status, and language background are collected to control for potential confounding variables in the analysis. In another hand, qualitative data collection, includes Semi-structured interviews, focus groups, and document analysis. In semi-structured interviews samples of teachers, students, and parents are interviewed. Focus group discussions is held with students to facilitate dialogue and gather diverse perspectives on their experiences in bilingual education settings. In document analysis, relevant policy documents, curriculum guides, and administrative reports were analyzed to contextualize the findings and understand the implementation of bilingual policies.

C. Sampling Strategy

A stratified random sampling strategy is employed to ensure that the sample is representative of the diverse contexts within which bilingual education operates in China. Schools are categorized based on geographic location (urban versus rural), type (public versus private), and the extent of bilingual program implementation. From each category, schools are randomly selected to participate in the study, ensuring a balanced representation of different educational contexts. Within each selected school, participants are chosen through purposive sampling, which included educators who have experience teaching in bilingual programs, students enrolled in bilingual programs alongside their peers in monolingual settings, and parents of students from both educational contexts to gain their perspectives on bilingual education. This comprehensive

approach aims to provide a thorough understanding of the impacts of bilingual education policies across varying environments.

D. Data Analysis

Data analysis involved both quantitative and qualitative techniques to triangulate findings and provide a comprehensive view of the research questions. For the quantitative analysis, statistical R software is utilized to examine the data. Descriptive statistics summarize demographic information and academic achievement metrics, while inferential ANOVA statistics compared the academic performance of students in bilingual versus monolingual programs, controlling for demographic variables. In terms of qualitative data analysis, information gathered from interviews and focus groups are transcribed and analyzed using thematic analysis, which involves identifying key themes and patterns related to participants' experiences in bilingual education settings. An open coding approach is initially categorized responses, followed by axial coding to connect themes and deepen the understanding of the findings. Finally, the qualitative findings are triangulated with quantitative results to validate conclusions and provide a more nuanced understanding of the impact of bilingual education policies, ensuring a rich and comprehensive interpretation of the data.

4. Results and Discussion

This section presents the results and discussion of the study on the impact of bilingual education policies on academic achievement, management strategies, and a comparative analysis of outcomes based on school demographics and regional policies.

A. Impact of Bilingual Education Policies on Academic Achievement

This section presents a detailed analysis of the impact of bilingual education policies on academic achievement, highlighting quantitative results derived from standardized test scores, GPAs, and language proficiency assessments.

Quantitative Results

To evaluate the effectiveness of bilingual education policies, we collected and analyzed data from students enrolled in bilingual programs compared to their peers in monolingual programs as illustrated in Table 1. The analysis focused on three main academic performance metrics: standardized test scores, Grade Point Averages (GPAs), and language proficiency assessments.

Table 1: Academic Performance Metrics by Education Type

Metric	Bilingual Education (Mean Score)	Monolingual Education (Mean Score)	p-value	Effect Size (Cohen's d)
Standardized Test Scores	85.6	78.4	<0.001	1.05

Grade Point Average (GPA)	3.7	3.2	<0.001	0.90
Language Proficiency Assessment	88.3	75.1	<0.001	1.20

The analysis of standardized test scores reveals that students in bilingual education programs achieved a mean score of 85.6, which is significantly higher than the mean score of 78.4 for students in monolingual programs. This difference is statistically significant, as indicated by a p-value of less than 0.001, suggesting that bilingual education positively influences academic performance in standardized assessments. The effect size, calculated as Cohen's $d = 1.05$, indicates a large effect, demonstrating that the difference in performance is not only statistically significant but also meaningful in practical terms. In addition to standardized test scores, the average GPA for students in bilingual programs was found to be 3.7, compared to 3.2 for their monolingual counterparts. This difference is also statistically significant ($p < 0.001$), reinforcing the notion that bilingual education contributes to improved overall academic performance. The effect size for GPA, with Cohen's $d = 0.90$, suggests a medium to large effect, indicating a substantial advantage for students in bilingual settings. Furthermore, language proficiency assessments revealed that bilingual students scored an average of 88.3, while their monolingual peers scored 75.1. The significant p-value of less than 0.001 confirms that bilingual education enhances language skills, which are crucial for academic success. Additionally, the effect size of Cohen's $d = 1.20$ illustrates a large effect, highlighting the strong impact of bilingual programs on language acquisition. Collectively, these findings underscore the effectiveness of bilingual education in promoting both academic achievement and language proficiency among students.

Correlation Analysis

To further explore the relationship between policy implementation and academic achievement, a correlation analysis was conducted. The following table summarizes the correlation coefficients between the implementation of bilingual education policies and academic performance metrics, Table 2.

Table 2: Correlation Between Bilingual Education Policy Implementation and Academic Performance

Academic Metric	Correlation Coefficient (r)	Significance (p-value)
Standardized Test Scores	0.65	<0.001
Grade Point Average (GPA)	0.58	<0.001
Language Proficiency Assessment	0.72	<0.001

The correlation coefficients reveal strong positive relationships between the implementation of bilingual education policies and academic performance across all metrics. This suggests that as the effectiveness of bilingual programs increases, so does student performance in various academic areas. Specifically, the correlation with language proficiency assessment is particularly noteworthy, with a coefficient of $r = 0.72$. This strong correlation implies that effective bilingual programs significantly enhance students' language skills, which in turn supports overall academic achievement. Moreover, the consistent statistical significance observed across all metrics, with p-values less than 0.001, underscores the robustness of these findings. This combination of strong correlations and statistical significance reinforces the notion that bilingual education policies have a meaningful impact on enhancing student outcomes.

B. Management Strategies and Best Practices

This section details the management strategies and best practices identified in the study, focusing on qualitative insights gathered from interviews with educators, administrators, and parents involved in bilingual education programs. The findings highlight effective management approaches that contribute to the success of these programs.

Qualitative Insights from Interviews

Through semi-structured interviews and focus groups, several key themes emerged regarding effective management strategies in bilingual education contexts. The analysis revealed how these strategies facilitate academic success, enhance teacher effectiveness, and improve student engagement, Table 3.

Table 3: Effective Management Strategies Identified in Interviews

Strategy	Description	Participant Feedback Highlights
Professional Development	Ongoing training for educators on bilingual methodologies and practices.	"Regular workshops have transformed our teaching methods."
Collaborative Teaching	Co-teaching models that leverage the strengths of multiple educators.	"Working together allows us to address diverse learning needs."
Community Engagement	Involvement of families and community members in school activities.	"Parent participation has increased student motivation significantly."
Data-Driven Decision Making	Utilizing academic performance data to inform instructional practices.	"Analyzing test scores helps us tailor our teaching strategies."

Strategy	Description	Participant Feedback Highlights
Culturally Relevant Curriculum	Designing curricula that reflect students' cultural and linguistic backgrounds.	"When students see their culture in lessons, they feel more connected."

The discussion highlights several key strategies for effective management in bilingual education, emphasizing the importance of continuous professional development for teachers. Targeted training sessions significantly enhance educators' ability to implement best practices and boost their confidence in teaching bilingual students, creating a more effective learning environment. Co-teaching models also emerge as a vital practice, allowing for collaboration among teachers, which facilitates differentiated instruction and enhances student engagement. Additionally, engaging families and the broader community is identified as crucial for increasing student motivation and fostering a supportive school environment. The importance of data-driven decision-making is underscored, with educators noting that analyzing student performance data helps identify trends and tailor instructional practices, positively impacting learning outcomes. Finally, the integration of culturally relevant curricula is highlighted as an effective strategy that fosters a sense of belonging among students and enhances their engagement, ultimately contributing to their academic success and well-being. These interconnected strategies collectively reinforce the need for a comprehensive approach to support diverse learners in bilingual education settings.

C. Comparative Analysis

The comparative analysis section investigates the differences in academic outcomes based on school demographics, particularly focusing on urban versus rural settings and regional policies related to bilingual education. It aims to understand how these factors affect the effectiveness of bilingual programs and their impact on student achievement. By categorizing study participants into various demographics, the analysis offers insights into how different contexts influence academic performance in bilingual versus monolingual programs. A key area of focus is the distinction between urban and rural schools, examining how location affects access to resources, teacher training, and community support for bilingual education. The analysis also considers ethnic minority schools, evaluating the effectiveness of bilingual programs in these contexts and the influence of regional education policies. Additionally, it explores how specific regional policies shape the delivery and effectiveness of bilingual education, highlighting the role of local governance in facilitating or hindering student outcomes. Overall, the analysis aims to provide a comprehensive understanding of the complex factors influencing bilingual education and student performance.

Table 4: Academic Performance by School Demographics

Demographic Category	Bilingual Program (Mean Score)	Monolingual Program (Mean Score)	p-value	Effect Size (Cohen's d)
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Urban Schools	87.2	79.5	<0.001	1.05
Rural Schools	82.4	75.3	<0.01	0.85
Ethnic Minority Schools	80.6	72.1	<0.001	1.10

In urban schools, students in bilingual programs achieved a mean score of 87.2, significantly higher than the 79.5 mean score of their monolingual peers, with a p-value of less than 0.001 and a large effect size (Cohen's $d = 1.05$). This success is attributed to the greater resources available in urban settings, including better-trained teachers and instructional materials. In contrast, rural bilingual students scored an average of 82.4, while their monolingual counterparts scored 75.3, reflecting a statistically significant difference ($p < 0.01$) and a medium effect size (Cohen's $d = 0.85$). However, the performance gap in rural areas is narrower, suggesting unique challenges such as limited resources and professional development. In ethnic minority schools, bilingual programs produced a mean score of 80.6, outperforming monolingual students who scored 72.1, with a significant p-value of less than 0.001 and an effect size of Cohen's $d = 1.10$. This highlights the effectiveness of bilingual education in these contexts, emphasizing the importance of culturally relevant curricula and community involvement in enhancing student engagement and achievement. Overall, the analysis reveals how demographic factors influence the effectiveness of bilingual education across different school settings.

D. Regional Policies Impact

Table 5, illustrates how regional policies influence the implementation and outcomes of bilingual education. Different regions may have varying levels of support for bilingual education, affecting resource allocation and program quality.

Table 5: Regional Policy Impact on Bilingual Education Outcomes

Region	Bilingual Program Policy Support	Mean Score (Bilingual)	Mean Score (Monolingual)	p-value
Region A (High)	Strong support	86.5	78.2	<0.001
Region B (Moderate)	Moderate support	82.0	76.0	<0.01
Region C (Low)	Limited support	78.0	74.5	>0.05

In Region A, strong policy support for bilingual education led to notable academic achievements, with students in bilingual programs attaining a mean score of 86.5, compared to 78.2 for their monolingual peers. This difference is statistically significant, with a p-value of less than 0.001, highlighting the significant positive impact of supportive policies on academic outcomes. The results from this region underscore how effective policy frameworks can enhance student

performance in bilingual settings. Conversely, Region B exhibited moderate policy support, resulting in mean scores of 82.0 for bilingual students and 76.0 for monolingual students, which remains statistically significant ($p < 0.01$). While the data indicates a beneficial effect of bilingual education, it is less pronounced than the outcomes observed in Region A. This suggests that while some policy support can improve academic performance, it may not be as effective without robust backing. In Region C, where there is limited support for bilingual education, the mean scores for bilingual students were 78.0, while monolingual students scored 74.5. The difference in scores was not statistically significant ($p > 0.05$), indicating that without adequate policy support, bilingual programs struggle to achieve better outcomes. This lack of significant improvement highlights the critical role that supportive policies play in the success of bilingual education initiatives, suggesting that greater attention is needed in regions with minimal support to enhance student achievement.

5. Conclusion

This study on the impact of bilingual education policies highlights significant insights into academic achievement, effective management strategies, and the influence of demographic and regional factors. Key findings indicate that students in bilingual programs outperform their monolingual peers in standardized test scores, GPAs, and language proficiency assessments, demonstrating the effectiveness of these programs in fostering language skills and academic success. Effective management strategies identified include continuous professional development for educators, collaborative teaching models, active community engagement, data-driven decision-making, and culturally relevant curricula. The comparative analysis revealed disparities in academic outcomes based on school demographics, with urban schools performing better than rural ones, and highlighted the importance of supportive regional policies, especially in ethnic minority schools. However, the study has limitations, including a potentially unrepresentative sample, a quasi-experimental design that limits causal conclusions, and the subjective nature of qualitative data. Future research should focus on longitudinal studies to assess long-term impacts, explore effective components of teacher training, investigate the role of technology in bilingual education, and examine how socioeconomic and community factors influence program effectiveness. Overall, the study underscores the importance of bilingual education and offers directions for further investigation to enhance its efficacy.

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