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Effect of ESOL Co-Teacher Certification on Student Achievement in High School Core Content Areas in a Georgia Suburban School District

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Effect of ESOL Co-Teacher Certification on Student Achievement in High School Core Content Areas in a Georgia Suburban School District

Abstract

This quantitative study investigated the relationship between ESOL co-teacher content certification and student achievement in secondary classrooms. The sample consisted of English Learners (ELs; $N = 185$) in a suburban district in Georgia. The study focused on three core content subjects: Algebra, Biology, and Economics. Content certification was verified through a state agency, and student achievement was assessed using Georgia Milestones test scores. A range of statistical tests, including descriptive and multilevel regression analyses, were employed to analyze the data. The results indicated that Milestones grade conversion scores were higher when teachers had dual certification ($M = 65.63$, $SD = 10.7$) versus single certification ($M = 62.38$, $SD = 8.03$). Further, multilevel regression analyses accounting for the nested structure of the data showed that teacher certification was a significant predictor of higher student scores, with dual certification predicting higher scores. This relationship did not show significant variations at the teacher level or by subject area. These findings suggest revising ESOL co-teacher scheduling in the studied context to promote equitable education for ELs.

Keywords

English learners, co-teaching, content certification, high school, student achievement

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English Learners (ELs) constitute a significant and growing demographic in U.S. K–12 education. In 2020, 10.3 percent of students in U.S. public schools, totaling approximately five million, were identified as ELs, an increase from 9.2 percent or 4.5 million students in 2010 (Irwin, 2023). In Georgia alone, ELs represented 11% of the student population during the 2022–23 academic year. The suburban district examined in this study reflects this diversity with 8% of the student population (3,360 students from 108 countries) served through ESOL programming (Governor’s Office of School Achievement [GOSA], 2023).

Empirical data from the National Assessment of Educational Progress (NAEP) and the Georgia Milestones Assessment System reveal concerning gaps between ELs and non-ELs, which we refer to as opportunity gaps throughout this paper to highlight the inequities of systems rather than something that might be construed as the fault of the students (Leo & Wilcox, 2023). While the studied district performs in consistent achievement measures with the Georgia state averages on Milestones testing, the disparity of scores arises when the EL sub-population is cross-examined with non-ELs. Per the 2022 NAEP results, only a small percentage of Georgia’s 8th-grade ELs achieved basic proficiency in math and reading, with 39- and 36-point gaps in reading and math, respectively (National Center for Education Statistics [NCES], 2023). Likewise, on the Georgia Milestones in 2023, only 8% and 2% of ELs scored proficient on the Algebra and American Literature and Composition assessments, respectively (GOSA, 2023).

To address the educational disparities ELs face, Georgia public schools have implemented English for Speakers of Other Languages (ESOL) programs, aiming to enhance ELs’ linguistic development and academic achievement. Central to these programs is the co-teaching model, a collaborative instructional approach involving both an ESOL teacher and a content-certified teacher. This model, endorsed by the Georgia Department of Education (GaDOE, 2023), fosters an inclusive learning environment where ELs can access content in a linguistically supportive framework.

In practice, co-teaching in ESOL settings can take various forms. One common approach is team teaching, where the ESOL and content-certified teacher jointly deliver instruction, blending language learning with subject matter content. Alternatively, in a supportive teaching model, the ESOL teacher primarily assists students in language acquisition while the content teacher focuses on the core subject matter. Another effective strategy is parallel teaching, where the class is divided, and each teacher leads a smaller group, allowing for more differentiated and focused instruction tailored to the needs of ELs. Moreover, co-teaching in ESOL settings often includes elements of collaborative planning and assessment. Both teachers bring their expertise to the table, creating lesson plans that integrate

language objectives with content goals and designing assessments that are fair and comprehensive for ELs. This integrated approach ensures that language learning is not isolated from content knowledge, but rather, both are developed concurrently (Dove & Honigsfeld, 2018, 2020).

The effectiveness of this model, however, raises critical questions. Specifically, this study investigates whether ESOL teachers lacking formal training in the core content areas for which they are scheduled can be as effective as their content-certified counterparts in enhancing student achievement. The exploration of this issue is crucial, as it has significant implications for teacher training, effective scheduling, resource allocation, and overall instructional strategy in ESOL programs. Therefore, the primary aim of this research is to examine the impact of ESOL co-teacher¹ content certification on student achievement, as measured by the Georgia Milestones. Specifically, the study sought to answer three research questions:

1. What is the distribution of student achievement scores in co-taught courses featuring content-certified vs. non-content-certified ESOL teachers?
2. What is the relationship between ESOL teacher content certification and Milestones scores for ELs?
3. To what extent does the relationship between content certification and Milestones scores for ELs vary across different subject areas?

By exploring these aspects, this study contributes to the ongoing discourse on effective strategies for EL education, informing educational policies and practices that could enhance both language proficiency and academic outcomes for ELs. Moreover, it seeks to provide insights into the role of teacher qualifications in addressing the opportunity gaps ELs face, thereby fostering a more equitable and inclusive educational landscape.

Conceptual Framework

The conceptual framework of this study synthesizes distributed cognition, team cognition, and Shulman's (1986) foundational theory of teacher knowledge to examine the efficacy of content certification among ESOL co-teachers. Each of these theoretical components directly informs the study's research questions.

¹ When referring to the instructional model, we use "co-teaching." When referring to the educators involved in this model, we use "co-teacher."

Distributed cognition posits that knowledge disseminates through material and social interactions (Hutchins, 2020), enabling team teachers to strengthen content understanding among themselves and their students. This theory informs the hypothesis underpinning the first research question that ESOL co-teachers with content certification will be more effective in enhancing student achievement, as their specialized knowledge can be more effectively shared and applied within the co-taught classroom environment.

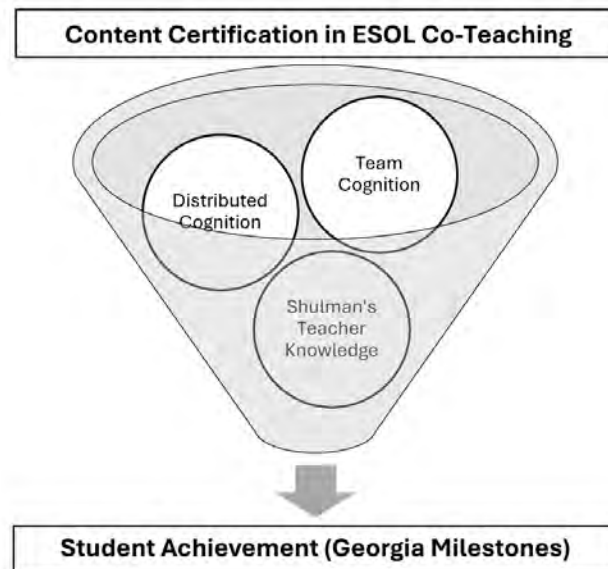
Team cognition extends this idea, arguing that heterogeneous but complementary skills among teachers could collectively drive success in educational settings (Damsa, 2022; Salas & Fiore, 2004). This component corroborates the second research question by suggesting that the relationship between ESOL teacher content certification and Milestones scores for ELs may vary depending on how well the co-teachers' skills complement each other, thus influencing student outcomes.

Conversely, Shulman's theory of teacher knowledge emphasizes the integral role of pedagogical content knowledge in effective teaching and, by extension, in boosting student achievement. This theory is critical in framing the third research question, which explores the extent to which the relationship between content certification and Milestones scores for ELs varies across different subject areas. Shulman's theory suggests that content-specific pedagogical knowledge is key to achieving higher student outcomes, particularly in subject areas that require deep content understanding.

As shown in Figure 1 below, these frameworks together investigate whether content certification in ESOL co-teachers affects educational outcomes for ELs in the co-taught context. By aligning the theoretical components with the research questions, the study aims to explore the nuanced ways in which teacher qualifications and team dynamics contribute to student success.

Figure 1

Conceptual Framework for ESOL Co-Teaching and Student Achievement



Teacher Certification and Student Achievement

The correlation between teacher certification and student achievement has been extensively studied, with a focus on various aspects of teacher qualifications and their impact on high school student performance. Clotfelter et al. (2010) utilized data from statewide end-of-course tests in North Carolina, uncovering that teacher credentials, particularly in terms of licensure and certification, significantly affect student achievement. Their study also highlighted the disparities in teacher credential distribution across different racial and socioeconomic student groups, linking this uneven distribution to the opportunity gaps observed in high schools. However, the study's reliance on quantitative data leaves unexplored the qualitative aspects of how these credentials influence day-to-day teaching practices and student engagement.

This finding is complemented by Goldhaber and Brewer's (2000) seminal work, which delves into how students of teachers with varying certification statuses, including probationary, emergency, and private school certifications, perform relative to those taught by teachers with standard certifications. In mathematics, Goldhaber and Brewer discovered that students of teachers with standard certifications achieved higher test scores than those taught by teachers with lesser or no subject-specific certification. Interestingly, they noted that students taught by teachers with emergency credentials did not fare worse than

those with teachers holding standard certifications, challenging prevailing assumptions about the necessity of standard certification for effective teaching. However, their study does not account for the long-term impacts of having non-standard certified teachers across multiple years, leaving a gap in understanding the cumulative effects of such educational experiences.

Hawk et al.'s (1985) more focused investigation into mathematics teacher certification contrasted with these broader studies. Hawk and colleagues specifically examined the relationship between mathematics teacher certification and teaching effectiveness, reporting a positive correlation. Their study provided empirical evidence supporting the assumption that certified teachers are more effective, particularly in teaching mathematics. This focus on mathematics teaching effectiveness resonates with the findings of Goldhaber and Brewer, who also emphasized the subject-specific impact of certification in mathematics. However, Hawk et al. (1985) compare different types of certifications as Goldhaber and Brewer did, which limited the scope of their findings to a more generalized conclusion about the benefits of certification in mathematics.

Recently adding to this body of research, Ezaki et al. (2024) explored the interconnectedness of teachers' knowledge across different content areas. Their study found that teacher certification types, particularly in mathematics, were positively associated with deeper and more interconnected content knowledge, which is critical for effective mathematics instruction. The study underscores the importance of certification and specific training in fostering a comprehensive understanding of mathematical concepts. Their findings suggest that beyond the mere possession of certification, the specific content and focus of the certification—such as a specialization in mathematics—play a crucial role in equipping teachers with the necessary knowledge to enhance student outcomes. Ezaki et al.'s findings also highlight a potential gap in the way teacher preparation programs are currently structured, which possibly limits their effectiveness in developing versatile educators capable of teaching interconnected content areas.

Additionally, Gomez-Najarro et al. (2023) critically examined dual certification programs, which have become a principal means of preparing teachers for inclusive practice. Their analysis of institutional discourse revealed that while some programs position dual certification as a transformational strategy to promote educational equity, the majority frame it as a practical means to earn two licenses, often without emphasizing inclusive teaching practices. This raises concerns about whether these programs are effectively preparing teachers to bridge opportunity gaps. This critique also highlights the complex relationship between certification and actual teaching effectiveness, especially in fostering inclusive educational environments, and it showcases the need for more research into how dual

certification programs can better integrate inclusive practices into their curriculum, and whether current certifications are adequate for meeting the diverse needs of students in inclusive classrooms.

The convergence of these studies underscores the nuanced yet significant role of teacher certification in shaping student outcomes. However, while the positive impacts of certification on student achievement are well-documented, the limitations of existing research, such as the lack of long-term studies and the narrow focus on quantitative outcomes, highlight the need for further exploration. Moreover, these studies suggest that the mere possession of certification may not be sufficient; the content and focus of the certification, as well as the training provided, play crucial roles in equipping teachers with the necessary knowledge to enhance student outcomes. This emphasis on content knowledge and certification resonates with the dynamics observed in co-teaching environments, particularly in the context of ESOL. As schools continue to adopt inclusive practices, the need for robust certification programs that equip teachers with both content expertise and the ability to effectively collaborate in diverse classrooms becomes increasingly critical for closing opportunity gaps.

Trends and Gaps in the Research

The landscape of co-teaching research, particularly concerning special education and ESOL, reveals a complex interplay of factors influencing its effectiveness. Much of the existing research focuses on the benefits of co-teaching without sufficiently addressing the challenges and limitations, leaving a gap in understanding the full spectrum of co-teaching dynamics. Based on interviews with high school co-teachers, Keefe and Moore's (2004) seminal work emphasized the necessity for special education teachers at the secondary level to understand high school content areas. Keefe and Moore identified key elements contributing to successful co-teaching, such as preparation dynamics, role clarity, resource allocation, collaborative planning, and professional cohesion. They also noted that co-teaching success was highly dependent on the compatibility of co-teachers and the support provided by the school administration, indicating that systemic factors can significantly influence the effectiveness of co-teaching practices.

Mastropieri et al. (2005) further expanded this understanding through case studies in content area co-teaching. Their findings highlighted three primary factors impacting co-teaching effectiveness: academic content knowledge, high-stakes testing pressures, and co-teacher compatibility. These factors underscore the challenges of implementing co-teaching in secondary classrooms, where the demands of content knowledge and standardized testing can strain co-teaching relationships and effectiveness. Mastropieri et al. also noted that the variability in

co-teacher compatibility and the inconsistent implementation of co-teaching models across schools can lead to mixed outcomes, which intimates a need for more standardized support systems for co-teaching.

More recently, Wagner et al. (2024) contribute to this discourse by systematically reviewing students' perceptions of co-teaching, revealing that while students often view co-teaching positively, their perceptions are significantly influenced by the contextual variables surrounding the teaching environment. Wagner et al.'s study emphasizes the need for considering students' voices in evaluating co-teaching practices, particularly in understanding how different contexts—such as classroom composition and teacher collaboration—affect student outcomes. However, the study's focus on perceptions rather than measurable outcomes limits its ability to draw definitive conclusions about the efficacy of co-teaching.

Adding to this, Rytivaara et al. (2024) conducted a systematic review of K–12 co-teaching literature and concluded that the relationship between teacher learning and co-teaching in professional development programs remains inadequately explored. Their analysis of various co-teaching programs highlighted significant variation in the concepts, methods, and practices used, underscoring the inefficiency in the current understanding of how co-teaching or teacher learning should be implemented. Their study also points to the critical need for more research on how professional development programs can better support teachers in learning to co-teach effectively, particularly in diverse classroom settings.

In exploring the effects of co-teaching on student achievement, Murawski and Swanson's (2001) meta-analysis stands out. They reviewed 89 research articles on co-teaching, though only three met their criteria for statistical analysis regarding special education students. Their findings indicate a moderate effect size of 0.40 for co-teaching on student outcomes in special education. However, the limited sample size necessitates caution in generalizing these results. Moreover, the study does not consider the specific contexts in which co-teaching was implemented, leaving questions about the consistency and reliability of co-teaching as a strategy for improving student outcomes across different educational settings.

Walsh (2012) approached this topic by analyzing standardized test scores from Maryland's elementary schools over six years and found a 22% increase in special education students' proficiency in reading and math. Walsh attributed this significant improvement to the consistent implementation of effective co-teaching practices. Beyond academic performance, co-teaching in special education has been linked to improved attendance, social satisfaction, and increased teacher-student interactions (Magiera & Zigmond, 2005; Tremblay, 2013; Walsh, 2012).

While these studies demonstrate the potential benefits of co-teaching, they also highlight the variability in implementation and the challenges of sustaining co-teaching practices over time.

Research on co-teaching in the context of ESOL lags that of special education, yet it presents unique challenges and opportunities, particularly when considering the distinct instructional needs of ELs. Unlike students with learning disabilities, ELs require specific language acquisition support within content classrooms, creating a demand for specialized co-teaching approaches (Bauler & Kang, 2020). The few existing studies are delineated below and collectively show a landscape where co-teaching strategies, while beneficial, are often hindered by systemic, administrative, and logistical barriers yet offer promising results in enhancing ELs' academic outcomes when effectively implemented.

Studies have emphasized the increasing value of co-teaching in ESOL settings. Most recently, DeVoss (2023) explored the utility and effectiveness of the co-teaching model for ELs, noting the emergence of co-teaching as a response to educational equity mandates and advocating for more extensive research in ESOL settings. Likewise, Bauler and Kang (2020) investigated the implementation of mandated collaboration between ESOL and content teachers in New York State, revealing resilient co-teaching practices despite challenges such as limited co-planning time and curricular constraints. These teams demonstrated significant improvements in ELs' proficiency levels, though their success was contingent upon the strength of interpersonal relationships and individual motivations, highlighting a lack of systemic support for co-teaching and co-planning (Bauler & Kang, 2020). While these findings are encouraging, they also point to the limitations of relying on individual teacher efforts to sustain co-teaching practices. Without systemic changes, such as increased co-planning time and administrative support, the scalability and sustainability of successful co-teaching models in ESOL contexts remain questionable.

Russell (2019) provided insights into the practical challenges and development of routines in co-teaching relationships in ESOL and mainstream classrooms. Russell's study underscored the importance of factors such as limited time, lack of support, and challenges in adapting to new co-teaching models. Despite these challenges, some co-teaching pairs were able to develop effective routines and capitalize on each teacher's strengths, demonstrating the potential for successful collaboration in co-taught ESOL settings (Russell, 2019). Russell also noted that the success of co-teaching relationships was highly variable, depending largely on the specific teachers involved and their ability to adapt to the demands of co-teaching.

This study seeks to fill a critical literature gap by exploring the relationship between ESOL co-teacher content certification and student achievement, a topic that has received limited attention in previous research. The district participating in this study has actively promoted co-teaching for ELs through extensive professional development and initiatives. These district-led initiatives include targeted professional learning sessions on collaborative planning, effective co-teaching strategies, and content-specific instructional practices. Additionally, the district has implemented an intentional collaborative team scheduling as a priority for ESOL co-teachers, pairing them with experienced content-certified teachers to foster skill development and provide ongoing support. These initiatives align the study's purpose with both academic research and local educational needs. By addressing the limitations of previous research and focusing on the specific context of ESOL co-teaching, this study aims to elucidate the association between ESOL co-teacher content certification and ELs' academic achievement

Method

This quantitative study focused on the interplay between the academic performance of ELs and the content certification status of ESOL teachers in co-taught high school classrooms. Guided by three research questions, it examined the distribution of ELs' academic scores in relation to the content certification of ESOL co-teachers, the relationship between such certification and student performance, and how this relationship varied across different subjects.

Research Design

Adopting a correlational research design, this study analyzed student achievement data from the Georgia Milestones assessment in three core subjects: Algebra, Biology, and Economics. Permissions were secured from a suburban school district in the southeastern United States to access teacher certification and student performance data. The study differentiated between classes led by dually certified (both in ESOL and the content subject) and singly certified ESOL co-teachers.

The researchers first communicated with the school district to identify the secondary courses co-taught with an ESOL collaborator. Under the direction of the district's Director of Assessment, the researchers used a public domain, the Georgia Professional Standards Commission website, to determine whether collaborators were certified in the content area. The researchers reviewed teachers' schedules and content certification in all content areas; however, some subject areas were excluded because of insufficient data or because all teachers in the content area were certified (i.e. English language arts) thus prohibiting comparisons. In each

content area, class selection was based on the availability of co-taught classes, the certification status of ESOL educators, and the permissions granted. The resulting sample included 10 co-taught high school classrooms: three Algebra classes, five Biology courses, and two Economics classes receiving naturally occurring interventions.

Each content area included classes of a) ESOL students in a co-taught content class whose teachers were both certified in the content area, and b) ESOL students in a co-taught content class where the co-teacher was not certified in the content area. Group (a) was termed the Dual Certification Group, whereas Group (b) was termed the Single Certification Group. To measure ESOL student achievement in co-taught classrooms, researchers gathered disaggregated data for English learners on the Georgia Milestones, a standardized assessment for all students enrolled in the selected content courses. Although the Milestones data were disaggregated by ELs, all other demographic and identifiable information was removed by the participating ESOL co-teachers prior to sharing the data with the researchers to protect the confidentiality of the students. The researchers also requested access to participating students' demographic information and ACCESS scores, a standardized measure of English language proficiency; however, they were not granted access to this information due to FERPA regulations.

Although the researchers did not have access to detailed student demographic information, the students' socio-economic status distribution was expected to be balanced among the various classroom settings. Additional considerations included the sequential high-school layout of the curriculum, which lead researchers to assume that students were similar in age if they were taking the same course.

Data Analysis and Procedure

Data collection and analysis procedures were systematically carried out, starting with the categorization of classrooms into Dual and Single Certification Groups based on the ESOL co-teachers' certification status, as determined by publicly available data found on the Georgia Professional Standards Commission's (GaPSC) online certification status tool (GaPSC, 2022). Teachers constituting the Dual Certification Group held both an ESOL certification and a content certification in the core content area studied here; the Single Certification Group contained teachers certified in ESOL but not in their scheduled core content. Subsequent statistical analyses sought to illuminate the impact of this variable on EL student achievement.

The data analysis process was multifaceted. The first research question was examined using descriptive statistics. The authors compared the location and spread of student scores between the two types of teacher certification by calculating summary statistics such as the mean, standard deviation, variance, range, minimum and maximum values. Further, the authors examined the frequency distribution of student performance levels by teacher certification.

Research Question 2

To investigate the second research question, the authors employed multilevel regression analysis to predict student Milestones scores based on teacher content certification. They used the *Mplus* 8.1 statistical software to estimate multilevel or hierarchical regression models, which account for the clustered nature of the data (Raudenbush & Byrk, 1986, 1988).

Recent studies emphasize the utility of multilevel models in situations with small sample sizes. Multilevel models can provide more accurate estimates than separate models for each group by leveraging information across groups. Further, research evidenced the applicability of multilevel models with two or three level-two units and showed that sample size in multilevel modeling is nuanced and context-dependent and should rely on the complexity of the regression model (Gelman & Hill, 2007).

Multilevel regression models estimate the relationships between predictor(s), which can be at various levels of the data, and a single outcome measured at the lowest level (Hox, 2010). In the current study, teacher content certification (0 = Single Certification, 1 = Dual Certification) was the predictor, whereas student Milestones conversion scores represented the outcome variable. Student Milestones scores were clustered under teachers (n clusters = 8, average cluster size = 23.125). The authors accounted for the nested structure of the data by estimating the relationship of interest at the individual and teacher levels.

Research Question 3

To examine the third research question, the authors investigated the relationship between teacher content certification and student scores across subject areas (n clusters = 3, average cluster size = 61.667). In addition to predicting intercept differences across groups, authors determined whether regression slopes varied significantly across groups. Like a moderation hypothesis, random slopes models specify that the relationship of interest differs between groups (Kelloway, 2014). The multilevel regression model did not include covariates due to the limited data available to researchers and restrictions imposed by the sample size.

Results

The initial phase of this study involved collecting and categorizing teaching schedules for all ESOL teachers in the target school district, specifically focusing on courses linked to the Milestones assessment. This process included inputting the names of ESOL co-teachers for Milestones courses into the GaPSC certification status website (GaPSC, 2022) to ascertain their content area certifications. Within the district, 12 Milestones courses were co-taught by ESOL teachers with dual certification in the content area, while eight were led by teachers holding only a single ESOL certification. However, a more detailed examination of the scheduling spread between the Single and Dual Certification Groups (Table 1) revealed certain limitations in the dataset. Five courses lacked comparative data from both groups and were eliminated from the analysis.

Table 1

Count of ESOL Co-Teachers per Core Content Milestones Course in the Dual Certification Group or the Single Certification Group

	Algebra	Geometry	U.S. History	Economics	Physical Science	Biology	American Lit	9th Lit
Dual Certification	1	2	1	1	0	2	3	2
Single Certification	2	0	0	1	2	3	0	0

Note. Zeros indicate that no secondary ESOL teachers in the district fit the specified certification group and course.

The distribution of teacher certifications resulted in a data imbalance, with 74% of the usable data originating from the Single Certification Group and 26% from the Dual Certification Group. Notwithstanding this limitation, the sample sizes for both the Single Certification Group ($n = 137$) and Dual Certification Group ($n = 48$) were sufficient for statistical analysis. The implications of this distribution and its potential effects on the study's outcomes will be further explored in the discussion of limitations and future research recommendations.

Research Question 1

The first research question examined the distribution of student achievement scores on the Georgia Milestones across classes with content-certified vs. non-content-certified ESOL teachers. Descriptive statistics were employed to

analyze the data for this focus of the study (Table 2). The analysis revealed a broader range of scores in the Dual Certification Group (48 points) compared to the Single Certification Group (43 points), despite the latter's larger sample size ($n = 137$ for Single Certification Group; $n = 48$ for Dual Certification Group). Both groups recorded a minimum Milestones score of 45, but the maximum scores diverged: 88 for the Single Certification Group and 93 for the Dual Certification Group. This finding suggests a higher performance ceiling in classes led by dually certified ESOL teachers.

Table 2

Descriptive Statistics of Student Achievement Scores on Georgia Milestones Across Classes in the Single Certification and Dual Certification Groups

	n	Range	Min	Max	M	SD	s^2
Single Certification	137	43	45	88	62.38	8.03	64.47
Dual Certification	48	48	45	93	65.63	10.7	114.5

Note. Mean is denoted by M ; sample population is denoted by n ; standard deviation is denoted by SD ; variance is denoted by s^2 .

An examination of score outliers within these groups yielded notable results. The Single Certification Group presented several high-score outliers (scores 82–88), which, while not traditionally considered exceptional, indicated a disparity compared to the Dual Certification Group, which contained no such outliers. The presence of these outliers in the Single Certification Group suggests a skew in the data, with their removal likely lowering the group's mean score ($M = 62.38$) further below that of the Dual Certification Group ($M = 65.63$).

Regarding achievement levels (*Developing*, *Proficient*, and *Distinguished Learners*), the Dual Certification Group outperformed the Single Certification Group (Table 3). The Dual Certification Group had higher percentages in all three achievement levels (29.7%, 8.33%, and 2.08%, respectively) than the Single Certification Group (14.6%, 5.11%, and 0%, respectively). These figures indicate a higher failure rate on standardized tests among ELs in classes where the ESOL teacher lacked content area certification.

Table 3

Frequency of Student Achievement Levels on Georgia Milestones Across Classes with ESOL Co-Teachers with a Single Certification vs. Dual Certification

Certification	Proficiency Level	Algebra		Biology		Economics		Total	
		<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Single Certification	Beginning	40	72.73	68	88.31	2	40	110	80.29
	Developing	10	18.18	8	10.39	2	40	20	14.6
	Proficient	5	9.09	1	1.3	1	20	7	5.11
	Distinguished	0	0	0	0	0	0	0	0
	<i>Total</i>	55	100	77	100	5	2.7	137	100
Dual Certification	Beginning	4	36.36	20	76.92	5	45.45	29	60.42
	Developing	4	36.36	4	15.38	6	54.55	14	29.17
	Proficient	3	27.27	1	3.85	0	0	4	8.33
	Distinguished	0	0	1	3.85	0	0	1	2.08
	<i>Total</i>	11	99.9	26	100	11	100	48	100

Note. Column labeled *f* denotes the count frequency, and the symbol % reveals the percent of each proficiency level per content area. Totals may not add up to 100 due to rounding.

Research Question 2

The second research question examined the relationship between ESOL co-teachers' content certification and ELs' academic achievement. Results from multilevel regression analysis showed that the relationship between teacher content certification and student scores was statistically significant at the individual level (estimate = 4.092, *SE* = .049, estimate/*SE* = 84.354, $p < .001$) but not at the teacher level (estimate = 2.509, *SE* = 2.792, estimate/*SE* = 0.899, $p = .369$). Similarly, the random slopes model yielded significant results at the individual level (estimate = 71.377, *SE* = 16.555, estimate/*SE* = 4.312, $p < .001$) but not at the teacher level (estimate = -1.188, *SE* = 2.864, estimate/*SE* = -0.415, $p = .678$), indicating that the strength of the relationship between teacher certification and student scores did not vary significantly across teachers. Further, the intraclass correlation (ICC) was close to zero (ICC = 0.095), indicating no association in scores among students with the same teacher. Dual-content certification predicted higher Milestones scores, but this relationship did not vary significantly by teacher.

Research Question 3

The third research question investigated the relationship between the content certification of an ESOL co-teacher in the content classroom and the achievement of ELs across subject areas. Due to an uneven distribution of teacher certifications across content areas, the multilevel regression analysis was conducted only in Algebra, Biology, and Economics. When examining the relationship between teacher content certification and student Milestones scores by subject area, multilevel regression results were significant at the individual level (estimate = 3.146, $SE = 1.209$, estimate/ $SE = 2.603$, $p = .009$) but not at the subject level (estimate = 6.134, $SE = 4.350$, estimate/ $SE = 1.410$, $p = 0.159$). The random slopes model yielded significant results at the individual level (estimate = 73.227, $SE = 12.119$, estimate/ $SE = 6.042$, $p < .001$) but not at the subject level (estimate = 0.996, $SE = 12.240$, estimate/ $SE = 0.081$, $p = 0.935$), indicating that the strength of the relationship between teacher certification and students scores did not vary significantly by subject area. The intraclass correlation was close to zero (ICC = 0.039), indicating no association among scores by subject area. Dual certification predicted higher student scores, but this relationship did not vary significantly across subject areas.

Discussion and Implications

This study ventures into largely uncharted territory, exploring the specific impact of ESOL co-teacher content certification on student achievement—a focus scarcely addressed in previous research. Due to the dearth of direct studies in the ESOL co-teaching domain, this investigation draws upon related insights from general and special education fields. Our findings are congruent with the broader educational research suggesting that certified teachers typically yield higher student achievement levels than their non-certified counterparts (Clotfelter et al., 2010; Ezaki et al., 2024; Goldhaber & Brewer, 2000; Hawk et al., 1985). This correlation is underpinned by Shulman's (1986) theory, which posits that a teacher's deep content knowledge catalyzes enhanced learning outcomes. Further, case studies in co-teaching contexts corroborate the necessity of content knowledge for effective co-teaching partnerships (Keefe & Moore, 2004; Mastropieri et al., 2005).

In Georgia, GaPSC certification is a teacher's content expertise benchmark. In this study, all participating teachers possessed clear and renewable certifications. However, a key distinction was observed between teachers solely certified in ESOL (Single Certification Group) and those holding dual certifications in ESOL and their respective content areas (Dual Certification Group). This distinction was statistically significant and indicative of heightened student achievement in the

Dual Certification Group, echoing the established theoretical and empirical frameworks.

The multifaceted analysis in the current study underscores the nuanced relationship between ESOL teacher certification and student achievement. The study's use of multilevel analytical methods enhances the robustness of the conclusions, offering a comprehensive examination of relationships from various perspectives. The approach highlights the importance of considering subject-specific contexts when evaluating the effectiveness of ESOL co-teacher certifications, informing both administrative decisions and educational policy developments.

The present study underscores the pivotal role of academic language acquisition in secondary education, particularly for ELs facing unmodified assessments like the Georgia Milestones (Gottlieb, 2006; Hendrix & Griffin, 2017). ESOL co-teachers, especially those with content mastery, are crucial in scaffolding content understanding through specialized vocabulary and Cognitive Academic Language Proficiency (CALP; Cummins, 1984). This dual expertise enables ESOL co-teachers to deliver comprehensible input, simultaneously fostering CALP and content knowledge (Cummins, 1984; Krashen, 1977).

While certification is a key indicator of content knowledge, it is not the sole factor in effective teaching. Regardless of their content certification status, ESOL co-teachers play a vital role in facilitating ELs' access to and mastery of content standards. However, our findings suggest that dual certification enhances teachers' ability to address linguistic and educational gaps. The study's results also indicate a significant association between dual certification and enhanced student achievement, shedding light on a potential influencer of the opportunity gap faced by ELs. Research indicates that ELs with advanced English language proficiency often outperform their non-EL peers on standardized tests (Ardasheva et al., 2012; Sugarman & Geary, 2018). Our findings suggest that effective linguistic and academic instruction, especially through strategically scheduled co-teaching, could be pivotal in bridging this gap.

The current study provided information on the distribution of the Georgia Milestone's scores in relation to ESOL teachers' certification (Research Question 1). Additionally, the study showed that teacher certification is a significant predictor of ELs' academic performance, and this relationship remains consistent across teachers (Research Question 2) or subject areas (Research Question 3). Although results from the current study are sample-specific, schools and districts should consider providing teachers with opportunities to obtain additional certifications in relevant subject areas. This could be done through targeted

professional development programs that emphasize content knowledge and instructional strategies tailored to individual teacher needs. Further, educational interventions could be more effective if they focus on enhancing individual student outcomes such as targeting student engagement, personalized learning, or differentiated instruction.

This research contributes a critical perspective to the ongoing discourse on educational equity for ELs. Highlighting the specific impacts of teacher certification in the co-teaching model underscores the potential of well-informed instructional strategies in addressing the unique challenges faced by this student population. As such, it calls for thoughtful consideration regarding ESOL educators' scheduling and professional development to enhance ELs' educational experiences and outcomes.

Limitations

This study, while yielding significant insights, encounters limitations that affect the generalizability of its findings. A notable limitation is the involvement of the first author as a participant, being a secondary ESOL teacher certified in mathematics and actively involved in co-teaching Algebra and Geometry courses. This dual role of the researcher as a participant introduces a potential for bias in data interpretation. To mitigate this, measures were taken, including seeking input from a quantitative expert, to ensure objectivity and credibility in data analysis.

Another constraint is the range of confounding variables not accounted for due to data limitations. Key factors such as students' language proficiency levels, socio-economic status (SES), academic backgrounds, and duration in ESOL programs were not examined, yet they may influence the results. Additionally, variables related to teachers' qualifications, experience, and instructional practices, including teaching style, co-teaching model, relationship dynamics within the co-teaching pair, years of teaching experience, and the quality of content and language instruction, were not explored but could significantly impact student outcomes. Nevertheless, the multilevel analyses assessed the teacher effect and took into account the nested structure of the data.

In terms of broader applicability, the study's findings must be viewed in the context of existing educational mandates and their implications. As highlighted by Quigney (2009), special educators and ESOL teachers must comply with the No Child Left Behind Act (now the Every Student Succeeds Act [ESSA]) regulations, mandating high qualifications and diverse certifications. These regulations impose on special education teachers the need to obtain certifications in multiple content areas, often exceeding the demands placed on their general education counterparts.

This rigorous requirement, while enhancing educational quality, may inadvertently contribute to teacher shortages in these fields. Quigney's (2009) descriptive analysis suggests that advocating for dual certification, as supported by this study, could potentially exacerbate challenges in teacher availability within the ESOL domain.

Therefore, while this study supports the efficacy of dual-certified ESOL co-teachers in enhancing student achievement, advocating for such certification standards must be balanced against the practical implications on the ESOL teacher workforce. The potential for increased demand and workload associated with dual certification could affect teacher recruitment and retention, an essential consideration for policymakers and educational leaders.

Recommendations for Future Research

Future research endeavors focusing on co-teacher content certification and its impact on ELs are poised to significantly benefit educators, policymakers, and the field of ESOL. Building upon the foundational work of this study, subsequent investigations should aim for a broader sample size. An expanded participant base would reinforce the robustness of the findings and enhance their applicability across diverse educational settings. In addition, future research should also consider the findings of Wagner et al. (2024), which highlight the importance of understanding how students' perceptions of co-teaching are shaped by contextual variables, including race, gender, and professional demands on teachers.

Additionally, further research should examine variations across demographic subgroups and estimate the impact of variables such as students' socio-economic status and length of time in the ESOL program. Another critical aspect that remained unexplored in this study is the relationship between students' language proficiency, as measured by ACCESS scores, and their performance on the Milestones assessments. Incorporating this dimension in future studies could yield a more nuanced understanding of how language proficiency intersects with academic achievement in the context of co-taught classrooms. Moreover, future research should consider delving into the professional backgrounds of participating teachers. This includes examining variables such as their years of experience, the extent and nature of their training, their teaching styles, and the specific co-teaching models employed in their classrooms. Understanding how teachers learn to co-teach through professional development programs is crucial, as it directly influences the effectiveness of the co-teaching models they implement (Rytivaara et al., 2024).

By addressing these aspects, future studies can potentially unravel the complex interplay of various factors that influence the efficacy of co-teaching arrangements. Understanding these nuances could greatly enhance the strategic deployment of ESOL co-teachers, ultimately leading to more effective instructional practices and improved outcomes for ELs. The exploration of these facets, which acted as confounding variables in the current study, promises to amplify the depth and scope of future research, offering more comprehensive insights and actionable recommendations for practitioners and policymakers in ESOL education.

Conclusion

Nearly five million English learners are enrolled in U.S. public schools, a presence that continues to steadily increase in the nation as well as in the local context (Governor's Office of School Achievement, 2018a; U.S. Department of Education, n.d.-c). Data exhibit that the dropout rate for this student population is double that of non-ELs, and adequate access to certified teachers serves as a contributing factor (Callahan, 2013). Thus, decision makers must advocate for this vulnerable student population to receive equitable education through linguistically and academically appropriate instruction.

Due to the sample size of this study, and, subsequently, the limited generalizability of the results, the implications for decision makers are limited to the local context. Nonetheless, the concern brought forth by these data alongside statewide statistics is the prominence of ELs failing the Georgia Milestones (Governor's Office of School Achievement, 2017; Sugarman & Geary, 2018). This study found statistical significance in the relationship between ESOL co-teacher content certification and student achievement on the Georgia Milestones. Results of this study offer decision makers of the participating school district data that support the hiring of dually certified ESOL teachers and scheduling their co-taught classes according to attained content certification. Furthermore, the general achievement gap demands the attention of policy makers to reassess the equity employed in the current practice of non-differentiated standardized tests and rigorous accountability measures.

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