ICPEL
Education Leadership Review of Doctoral Research

Fall 2024
Volume 12
ISSN 2832-4250

International Council
ICPEL
of Professors of Educational Leadership

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The **Education Leadership Review of Doctoral Research (ELRDR)** is an ICPEL publication of doctoral research in education leadership and a companion peer-reviewed journal to the Education Leadership Review (ELR). Lead authors are recent doctoral graduates with chair or committee member serving as coauthor/s. Research is limited to dissertations, capstones, and action research projects. The purpose of the ELRDR is to disseminate the results of doctoral research in education leadership and school administration.

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Education Leadership Review of Doctoral Research

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From the Editors

This issue of *Education Leadership Review of Doctoral Research (ELRDR)* is published in recognition of the extensive work that recent doctoral graduates, chairs, and/or committee members complete to augment the field of education leadership and administration. The ongoing quest to focus on research-based findings to create a bridge between theory and practice in K-12 education and school leadership remains essential, especially amidst the transition in presidential administrations. These transitions often add to the landscape of educational leadership; these may be in the form of new requirements, new policies, or the removal of existing ones. As such, we are excited to support the work of recent doctoral graduates to continue to examine relevant, empirical research in an effort to better understand existing challenges and opportunities within the field. We encourage you to further promote our aims to your colleagues and recent graduate students so that we may continue to support new authors and contribute to recent, innovative, and meaningful work. Additionally, we remain deeply grateful to our authors, editorial advisors, and peer reviewers for continuing such scholarly in research and practice.

As educators, researchers, and policymakers, we are reminded of the dynamic interplay of personal, cultural, and systemic factors shaping educational experiences worldwide. The compelling qualitative study by Drs. Olson and Wharton-Beck explores the journeys of 15 high school valedictorians from diverse school settings. Through the lenses of culturally responsive pedagogy, marginality and mattering, and habits of mind, this research uncovers the motivational forces and personal qualities that enabled these top achievers to overcome adversity. The findings provide actionable recommendations for parents, educators, and school officials to nurture robust support systems and cultivate strong personal qualities in students, fostering resilience and a healthy mindset.

Drs. DeLucia and Yavuz examine parental and community involvement and offer crucial insights into the perceptions of middle school parents across varied District Reference Group classifications. This qualitative study highlights the barriers and challenges parents face in engaging in their children's education, while presenting strategies for schools to proactively promote parental involvement. The implications of this research have the potential to strengthen partnerships between schools and families, enhancing student outcomes across diverse school profiles.

Also, the exploration of mobile technology adoption in Kenyan universities shifts our focus to higher education and the digital era. Surveying professors from five universities, this study by Drs. Stanley and Jewell underscores their proficiency and positive attitudes toward using hand-held devices in classrooms. However, it also calls attention to the challenges associated with integrating such technologies, advocating for policies and governmental investment in educator training to maximize the potential of mobile learning tools.

In two distinct but equally impactful studies, Dr. Slate and his teams address the persistent disparities in academic performance. The first study (Rodriguez & Slate) compares reading performance among Grade 4 Emergent Bilingual and non-Emergent Bilingual students in Title I, Part A schools. The second study (Amerson et al.) examines gender differences among African American students on Texas' Algebra I End-of-Course exams, revealing that African American girls consistently outperform their male counterparts. In both studies, significant gaps are identified, with recommendations for targeted interventions and future research to address these inequities. These findings reinforce the need for tailored approaches to foster equity in educational opportunities and outcomes.

Drs. Vanessa Rodriguez's and Daniel Gutmore's study highlights the vital role of physical education (PE) policies in influencing academic achievement. Using fixed effects panel data analysis, the research explores national associations between mandated PE time and standardized test performance in reading and math. The findings underscore the importance of structured physical activity in schools, emphasizing its broader implications for student health and educational outcomes. This work contributes to the limited literature connecting PE policies with academic performance, advocating for a balanced approach to curriculum design.

In Drs. Chatterjee et al.'s case study reflects on the transformative impact of the Covid-19 pandemic on education. Investigating teacher perceptions of blended learning in a southeast Texas high school, the study reveals how digital platforms continue to shape the post-pandemic education landscape. Blended learning emerges as a strategy to address student disengagement and foster meaningful engagement in a rapidly evolving educational environment. This research provides practical insights for educators navigating the challenges of the new normal in K-12 settings.

Together, these studies reflect the diverse and interconnected challenges of education today. From the voices of high school valedictorians to the experiences of middle school parents, university professors, and emergent bilingual students, this issue highlights the importance of contextually aware and evidence-based approaches in shaping educational practices and policies. We hope that the insights presented in these manuscripts inspire reflection, dialogue, and action within your respective fields. As always, we are grateful to our contributors for their rigorous scholarship and to our readers for their engagement and commitment to advancing education.

Sincerely,

Jafeth E. Sanchez, PhD
Editor, The Education Leadership Review of Doctoral Research

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Differences in the Reading Performance of Texas Grade 4 Emergent Bilingual and Non-Emergent Bilingual Students Enrolled in Title I, Part A Schools: A Multiyear, Statewide Investigation

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Dr. Dawn Rodriguez is a recent graduate of the K-12 Doctoral Program in Educational Leadership at Sam Houston State University. This article is part of her journal-ready dissertation she completed in December 2023. Dr. Rodriquez currently serves as the Chief of Accountability, Assessment, & Analytics in the Aldine Independent School District.

Dr. John R. Slate is a Professor in the Department of Educational Leadership at Sam Houston State University. He served as the chair of Dawn's doctoral committee. To date, he has published over 450 refereed journal articles and 15 books. Dr. John R. Slate is the corresponding author and can be contacted at jrs051@shsu.edu.

In this investigation, the reading performance of Texas Grade 4 Emergent Bilingual and non-Emergent Bilingual students was compared by their enrollment in Title I, Part A schools. Data were obtained from the Texas Education Agency Public Education Information Management System for all Grade 4 Emergent Bilingual and non-Emergent Bilingual students in Texas who took the State of Texas Assessment of Academic Readiness assessment in the 2016-2017, 2017-2018, and 2018-2019 school years. Statistically significant differences were established in all three school years. Non-Emergent Bilingual students enrolled Title I, Part A schools outperformed Emergent Bilingual students enrolled in Title I, Part A schools in all three Reading Reporting Categories and in all three grade level standards. Recommendations for research and implications for policy and practice are suggested.

Keywords: Approaches Grade Level Performance, Emergent Bilingual, Grade 4, Masters Grade Level Performance, Meets Grade Level Performance, STAAR Reading, Title I, Part A

Introduction

Over the past decade the diversity of the United States population has changed dramatically. The number of Emergent Bilingual students, formerly referred to as Limited English Proficient, English Language Learners, and English Learners continues to increase. The percentage of United States public school enrollment was 9.2%, or 4.5 million students in Fall of 2010, compared to a percentage of 10.3%, or 5.0 million students 10 years later in the Fall of 2020 (National Center for Education Statistics, 2023a, para. 1). As noted by Quintero and Hansen (2017), Emergent Bilingual students constitute the fastest growing group of all public school students in the United States (Brown Center Chalkboard, 2017, para.4). This subgroup now accounts for approximately 10% of all students in public schools.

Federal laws have established the rights of Emergent Bilingual students to receive appropriate language supports that assist in their acquisition of English proficiency. In addition, these laws have mandated that school districts provide Emergent Bilingual students equitable access to education through specialized instructional programs and resources (Civil Rights Act of 1964 (Title VI); *Lau v. Nichols,* 1974). More recently, the Every Student Succeeds Act was passed in 2015 by the United States Department of Education. This law, which replaced the No Child Left Behind Act of 2002, was enacted with mandates aimed at ensuring all students receive an equitable, high-quality education. Under the Every Student Succeeds Act of 2015, Title III was reauthorized to specifically address the educational needs of Emergent Bilingual students. The goals of Title III include ensuring Emergent Bilingual students attain English proficiency and develop language skills that support their academic achievement in English (Texas Education Agency, 2022a). Funds have been made available to school districts through Title III to provide staff development, purchase additional academic and language resources, increase parent and community involvement, and develop curriculum and courses aimed enhancing the education experience of Emergent Bilingual students (U. S. Department of Education, 2023). As such, states have utilized available funding to implement processes to close educational achievement gaps (U.S. Department of Education, 2017).

Despite policies targeted at closing educational achievement gaps, recent data from the 2022 National Assessment of Educational Progress show non-Emergent Bilingual students outperforming Emergent Bilingual students at every grade level examined. These results are consistent with historical National Assessment of Education Progress data which indicate over the past two decades the presence of substantial reading disparities between Emergent Bilingual students and non-Emergent Bilingual students at Grades 4, 8, and 12 (NAEP Report Card: Reading, 2023b). In all of the measures of reading in the National Assessment of Educational Progress at all of the grade levels assessment, Emergent Bilingual students had statistically lower levels of reading achievement than their non-Emergent Bilingual peers (NAEP Report Card: Reading, 2023b). Readers are directed to the extensive tables and statistics in the NAEP Report Card: Reading (2023b).

The intersection of poverty and Emergent Bilingual status should also be considered when it comes to student academic needs. According to the National Center for Children in Poverty (2021, p. 1), 38% of all children in the United States live in low-income homes

and 17% meet the criteria for being economically disadvantaged. Of the 38% living in low-income families, Hispanic children constitute the largest portion, with 36% living in low-income homes. In addition, of all children living in poverty, children of immigrant parents are more likely to be low-income than their peers whose parents were born in the United States (National Center for Children in Poverty, 2021). To support the academic needs of students living in poverty, the Title I program, originally authorized under the Elementary and Secondary Act of 1965, was reauthorized in 2015 under the Every Student Succeeds Act. The purpose of this title is to provide all children equitable access to resources and supports as part of a high-quality education aimed at closing educational achievement gaps (U.S. Department of Education, 2022). Specifically provided by the Title I program are additional resources to enhance the quality of instructional programs and to improve the likelihood that students in poverty can meet state assessment mandates (Texas Education Agency, 2022, para. 1)

With regard to the state of interest for this study, Texas, researchers (Harris, 2018; Mason, 2022) have analyzed the degree to which differences were present in the reading performance of Texas students on the State of Texas Assessments of Academic Readiness (STAAR), a mandated summative assessment, by their economic status (i.e., economically disadvantaged, not economically disadvantaged). In a recent Texas investigation, Harris (2018) addressed the extent to which the economic status of Texas Grade 4 students was related to their reading performance. Data were analyzed for three school years (i.e., 2012-2013, 2013-2014, 2014-2015) and documented statistically significantly lower reading achievement for students who were poor than their peers who were not poor. Regarding the three grade level standards (i.e. Approaches Grade Level, Meets Grade Level, and Masters Grade Level), statistically significantly lower percentages of students who were poor met these grade level standards than their peers who were not poor (Harris, 2018).

In a related study, Mason (2022) examined the degree to which the economic status of Grade 4 Black boys was related to their reading achievement. Analyzed were STAAR data for three school years (i.e., 2016-2017, 2017-2018, 2018-2019). Established in the study was that Black boys who were economically disadvantaged had statistically significantly lower reading achievement levels than their peers who were not in poverty. Regarding the three passing standards (i.e., Approaches Grade Level, Meets Grade Level, and Masters Grade Level), statistically significantly lower percentages of Black boys in poverty met these three grade level standards than their peers who were not in poverty (Mason, 2022).

The academic achievement of Emergent Bilingual students on the STAAR Reading test plays an integral role in providing valuable data on student progress toward mastery of literacy instruction in reading and all other content areas. In a recent Texas investigation, Resilla and Slate (2023) compared the reading college readiness of Emergent Bilingual girls to the reading college readiness of non-Emergent Bilingual girls utilizing data from the state-mandated English II End-of-Course exam. They analyzed data for two school years (i.e., 2017-2018, 2018-2019) and documented the presence of statistically significant differences in the reading college readiness of Emergent Bilingual girls and non-Emergent Bilingual girls. In each of the school years examined, Emergent Bilingual girls had statistically significantly lower reading achievement levels than their non-Emergent Bilingual peers. According to Resilla and Slate (2023), this low performance would be

predictive of not being successful at the postsecondary level.

In another Texas study, Sáenz (2022) examined the degree to which school type (i.e., Title I, Non-Title I), English Learner percentages, and economically disadvantaged percentages predicted student performance at the Masters Grade Level standard on the Grade 3 STAAR Reading test in the 2018-2019 school year. Documented in the study was that approximately 61% of the variance in the Masters Grade Level performance by third grade students could be explained by a combination of the predictor variables she analyzed. When the predictor variables were analyzed independently, English Learner percentages and economically disadvantaged percentages were determined to statistically significantly predict the performance of students on the Grade 3 STAAR reading test. Of note is that each variable was determined to have a negative relationship with student performance. Specifically, as the percentage of each of these variables increased, student performance decreased (Sáenz, 2022).

Similarly, Schleeter (2017) examined the degree to which the economic status of Grade 3 Emergent Bilingual students in Texas schools was related to their reading achievement. Data were analyzed for three school years (i.e., 2012-2013, 2013-2014, 2014-2015). Results were the presence of statistically significant differences in the reading performance of Emergent Bilingual students. In each of the three school years examined, Emergent Bilingual students who were economically disadvantaged had statistically significantly lower reading achievement levels than their peers who were not poor (Schleeter, 2017).

Addressed in this multiyear investigation was the relationship between the reading achievement of Emergent Bilingual and non-Emergent Bilingual students and enrollment in Title I, Part A schools. Findings from this study will add to the existing research literature. After an extensive search of the research literature, only one published study (Sáenz, 2022) could be located in which a researcher had addressed the relationship between reading achievement and the combination of Emergent Bilingual status and enrollment in a Title I, Part A or non-Title I, Part A school.

Statement of the Problem

Emergent Bilingual students are a highly diverse group of students—representing many languages, cultures, ethnicities, and nationalities—enrolled in school districts throughout the United States (U.S. Department of Education, 2015). By 2025, Emergent Bilingual students are projected to account for 25% of the total K–12 enrollment in the United States (National Education Association, 2019). Because this population of students continues to grow in schools across the nation, and specifically in Texas, educational leaders must ensure reading instruction maximizes opportunities for Emergent Bilingual students, as well as other students. Relationships between Emergent Bilingual status and reading achievement have been documented to exist (Resilla & Slate, 2023; Sáenz, 2022; Schleeter, 2017). Researchers (Harris, 2018; Mason, 2022) have also examined the relationships between poverty and reading achievement. However, only one study (Sáenz, 2022) could be located in which a researcher had addressed the relationship between reading achievement and the combination of Emergent Bilingual status and enrollment in a

Title I, Part A school. For this reason, the focus of this investigation was on Grade 4 Emergent Bilingual and non-Emergent Bilingual students and the degree to which enrollment in a Title I, Part A school is related to reading performance on the state-mandated reading assessment in Texas.

Purpose of the Study

The purpose of this study was to determine the degree to which enrollment in a Title I, Part A school was related to the reading performance of Texas Grade 4 Emergent Bilingual and non-Emergent Bilingual students. Specifically addressed herein was the degree to which differences were present between Texas Grade 4 Emergent Bilingual and non-Emergent Bilingual students enrolled in a Title I, Part A school on the STAAR Reading Reporting Categories. Also examined was the extent to which differences existed in the percentages of Texas Grade 4 Emergent Bilingual and non-Emergent Bilingual students enrolled in a Title I, Part A school achieving at three performance levels (i.e., Approaches Grade Level, Meets Grade Level, and Masters Grade Level). The final purpose of this study was to determine if any trends were present in the reporting categories and performance levels across three school years (i.e., 2016-2017, 2017-2018, 2018-2019) for Texas Grade 4 Emergent Bilingual and non-Emergent Bilingual students enrolled in Title 1, Part A schools.

Significance of the Study

The underachievement of Emergent Bilingual students in reading is a multifaceted topic that continues to garner attention at the national and international levels. Although some progress has been made, challenges still exist in effectively supporting the academic needs of Emergent Bilingual students. After an extensive review of the literature (i.e., the EBSCO Host database for academic journals and google scholar), only one published work (Sáenz, 2022) could be located regarding the interrelationships between Emergent Bilingual status, literacy, and enrollment in Title I, Part A schools in the formative elementary school years as measured by the State of Texas Assessment of Academic Readiness. By analyzing the reading performance of Emergent Bilingual students enrolled in Title I, Part A and non-Title I, Part A schools on this assessment, their relationships to reading skills acquisition could be revealed at the first level of high stakes testing in Texas' students' educational experiences. Findings from this study may have practical application for educational leaders—particularly educational leaders at the elementary level in Texas—in ensuring all students, regardless of their Emergent Bilingual status and enrollment status in a Title I, Part A school, master foundational reading skills in elementary school. In addition, findings from this study can be used by educators to ensure timely intervention is provided to students by highly qualified teachers with experience in second language acquisition. Finally, findings from this study can be used by local and state lawmakers as they collaborate to implement policies that ensure adequate funding is set aside for Emergent Bilingual programs and culturally responsive instruction that aims to eradicate the achievement gap in reading is provided to all Emergent Bilingual students.

Research Questions

In this study, we addressed the following overarching research question: What is the difference in the STAAR Grade 4 Reading performance between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools? Specific subquestions under this overarching research question were: (a) What is the difference in the understanding across genres performance between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools?; (b) What is the difference in the understanding/analysis of literary texts performance between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools?; (c) What is the difference in the understanding/analysis of informational texts performance between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools?; (d) What is the difference in the Approaches Grade Level standard between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools?; (e) What is the difference in the Meets Grade Level standard between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools?; (f) What is the difference in the Masters Grade Level standard between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools?; and (g) What trends might be present in performance between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools? These research subquestions were addressed for three school years (i.e., 2016-2017, 2017-2018, and 2018-2019.

Methods

Research Design

For this investigation, the research design was non-experimental, quantitative, causal comparative (Johnson & Christensen, 2020). A causal comparative design was used to find relationships between the independent and dependent variables that have already taken place (Johnson & Christensen, 2020). In this investigation, statewide archival data of the reading achievement of Grade 4 Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools was analyzed to ascertain the effect of Emergent Bilingual status on their achievement in reading. The independent variable in this investigation was the Emergent Bilingual status (i.e., Emergent Bilingual or non-Emergent Bilingual) of Texas Grade 4 students enrolled in Title 1, Part A schools. The dependent variables were the three STAAR Reading Reporting Categories (i.e., Reporting Category 1, Reporting Category 2, and Reporting Category 3) and the three STAAR Reading Performance Levels (i.e., Approaches Grade Level, Meets Grade Level, Masters Grade Level) for Grade 4 Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools in Texas.

Participants and Instrumentation

The data that were analyzed in this investigation were requested from the Texas Education Agency Public Education Information Management System. Participants in this

investigation included Grade 4 Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools in Texas who were administered the STAAR Reading exam in the 2016-2017, 2017-2018, and 2018-2019 school years. The request was made for datasets to include: (a) Grade 4 Emergent Bilingual students enrolled in Title I, Part A schools, (b) Grade 4 non-Emergent Bilingual students enrolled in Title I, Part A schools, (c) STAAR Reading Performance Levels, and (d) STAAR Reporting Categories for the years of data in this investigation.

Reading achievement was ascertained using the three STAAR Reading Reporting Categories. In STAAR Reading Reporting Category 1, students' ability to understand and analyze written texts across multiple genres is measured. In STAAR Reading Reporting Category 2, students' ability to understand and analyze literary texts is measured. In STAAR Reading Reporting Category 3, the students' ability to understand and analyze information texts is measured. The Texas Education Agency introduced three performance levels (i.e., Approaches Grade Level, Meets Grade Level, Masters Grade Level) in 2017 to communicate how well students achieved on the STAAR Reading Assessment (Texas Education Agency, 2017). The Texas Education Agency (2017) defines Approaches Grade Level as students who have demonstrated proficiency in applying knowledge and skills in familiar contexts but will most likely need some academic intervention to be successful in the next grade level. Meets Grade Level is defined by the Texas Education Agency (2017) as students who have demonstrated proficiency in critical thinking skills when applied to familiar contexts. Students at this grade level standard may need short-term targeted intervention in the subsequent grade level. Masters Grade Level means that students have successfully demonstrated critical thinking skills and proficiency in applying knowledge and skills in various contexts. These students are expected to succeed in the next grade level with no intervention needed (Texas Education Agency, 2017).

For the purpose of this investigation, a Title I, Part A school was defined by the United States Department of Education (2018) as a school in which children from low-income families make up at least 40% of enrollment and are eligible to use Title I funds to operate schoolwide programs that serve all children in the school to raise the achievement of the lowest-achieving students. Furthermore, the Texas Education Agency (2022) has outlined that Title I, Part A of the Elementary and Secondary Education Act, as amended by the Every Student Succeeds Act of 2015, provides supplemental funding to state and local educational agencies to acquire additional education resources at schools serving high concentrations of students from low-income homes. These resources are used to improve the quality of education programs and ensure students from low-income families have opportunities to meet challenging state assessments. A low-income family was defined as a family in which students have been categorized by the Texas Education Agency as economically disadvantaged. According to the Texas Education Agency (2015), a student who is economically disadvantaged is eligible for free or reduced-price meals under the National School Lunch and Child Nutrition Program. Eligibility for free lunch requires a family income of 130% or less than the federal poverty line. Eligibility for reduced-price lunch requires a family income of 131% -185% of the federal poverty line (Texas Education Agency, 2021b). According to Texas Administrative Code §29.*052* (2021), an Emergent Bilingual is a student whose primary language is other than English and whose English

language skills are such that the student has difficulty performing ordinary classwork in English.

Results

Prior to conducting inferential statistics to determine whether statistically significant differences were present in the reading performance between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools, underlying assumptions were checked (Slate, 2023). Specifically examined were data normality, Box's Test of Quality of Covariance, and the Levene's Test of Quality of Error Variances. Although not all of the assumptions were met, Field (2009) contends that the Multivariate Analysis of Variance (MANOVA) procedure is sufficiently robust to withstand assumption violations. Results of statistical analyses for the 2016-2017, 2017-2018, and 2018-2019 school years will be described by Reading Reporting Category in chronological order.

Overall Results for the Three School Years

Regarding the 2016-2017 school year, the MANOVA revealed a statistically significant difference, Wilks' $\Lambda = .94$, $p < .001$, partial $\eta^2 = .06$, between the overall reading performance of Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools. The effect size for this statistically significant difference was moderate (Cohen, 1988). Concerning the 2017-2018 school year, the MANOVA revealed a statistically significant difference, Wilks' $\Lambda = .96$, $p < .001$, partial $\eta^2 = .04$, between the overall reading performance of Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools. Based on Cohen's (1988) criteria, the effect size was small. With respect to the 2018-2019 school year, the MANOVA again revealed a statistically significant difference, Wilks' $\Lambda = .97$, $p < .001$, partial $\eta^2 = .03$, small effect size (Cohen, 1988).

Reading Reporting Category 1 Results Across all Three School Years

Following the overall results of the MANOVA, univariate follow-up Analysis of Variance (ANOVA) procedures were conducted for each of the three STAAR Reading Reporting Categories. For the 2016-2017 school year, a statistically significant difference in Reading Reporting Category 1 for Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools was yielded, $F(1, 144820) = 7{,}095.99$, $p < .001$, partial $\eta^2 = .05$, small effect size. Concerning the 2017-2018 school year, a statistically significant difference was revealed on Reading Reporting Category 1 for Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools, $F(1, 117628) = 4{,}340.58$, $p < .001$, partial $\eta^2 = .04$, small effect size. With respect to the 2018-2019 school year, a statistically significant difference was again yielded on the Reading Reporting Category 1 for Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools, $F(1, 116172) = 3{,}318.26$, $p < .001$, partial $\eta^2 = .03$, small effect size. Effect sizes for the statistically significant differences on Reading Reporting Category 1 were

small for all three school years.

Concerning the 2016-2017 school year, non-Emergent Bilingual students enrolled in Title I, Part A schools answered 0.96 more items correctly than Emergent Bilingual students enrolled in Title I, Part A schools. Regarding the 2017-2018 school year, non-Emergent Bilingual students enrolled in Title I, Part A schools answered 0.82 more items

Table 1

Descriptive Statistics for the STAAR Grade 4 Reading Reporting Category 1, 2, and 3 Scores of Emergent Bilingual and Non-Emergent Bilingual Students Enrolled in Title I, Part A Schools for the 2016-2017, 2017-2018, and 2018-2019 School Years

Category, School Year, and Language Status	*n*	*M*	*SD*
Reporting Category 1			
2016-2017			
Non-Emergent Bilingual	99,484	5.67	2.00
Emergent Bilingual	45,338	4.71	2.06
2017-2018			
Non-Emergent Bilingual	81,895	5.63	1.95
Emergent Bilingual	35,735	4.81	2.02
2018-2019			
Non-Emergent Bilingual	79,306	5.78	1.92
Emergent Bilingual	36,868	5.08	1.92
Reporting Category 2			
2016-2017			
Non-Emergent Bilingual	99,484	10.01	3.39
Emergent Bilingual	45,338	9.18	3.18
2017-2018			
Non-Emergent Bilingual	81,895	10.07	3.30
Emergent Bilingual	35,735	8.73	3.30
2018-2019			
Non-Emergent Bilingual	79,306	9.98	3.31
Emergent Bilingual	36,868	9.10	3.28
Reporting Category 3			
2016-2017			
Non-Emergent Bilingual	99,484	7.78	3.44
Emergent Bilingual	45,338	7.24	3.19
2017-2018			
Non-Emergent Bilingual	81,895	8.76	3.15
Emergent Bilingual	35,735	7.60	3.03
2018-2019			
Non-Emergent Bilingual	79,306	8.60	3.03
Emergent Bilingual	36,868	7.68	2.92

correctly than did Emergent Bilingual students enrolled in Title I, Part A schools. With respect to the 2018-2019 school year, non-Emergent Bilingual students enrolled in Title I, Part A schools answered 0.70 more items correctly than did Emergent Bilingual students enrolled in Title I, Part A schools. Delineated in Table 1 are the descriptive statistics for this analysis.

Reading Reporting Category 2 Results Across all Three School Years

Next, ANOVA procedures were conducted for the STAAR Reading Reporting Category 2. For the 2016-2017 school year, a statistically significant difference in Reading Reporting Category 2 for Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools was yielded, $F(1, 14480) = 1{,}934.10$, $p < .001$, partial $\eta^2 = .01$, small effect size. Concerning the 2017-2018 school year, a statistically significant difference was revealed on the Reading Reporting Category, $F(1, 117628) = 4{,}137.75$, $p < .001$, partial $\eta^2 = .03$, small effect size. With respect to the 2018-2019 school year, a statistically significant difference was again yielded on the Reading Reporting Category, $F(1, 116172) = 1{,}772.32$, $p < .001$, partial $\eta^2 = .02$, small effect size. Effect sizes for Reading Reporting Category 2 were small for all three school years.

Concerning the 2016-2017 school year, non-Emergent Bilingual students enrolled in Title I, Part A schools answered 0.83 more items correctly than did Emergent Bilingual students enrolled in Title I, Part A schools. Regarding the 2017-2018 school year, non-Emergent Bilingual students enrolled in Title I, Part A schools answered 1.34 more items correctly than did Emergent Bilingual students enrolled in Title I, Part A schools. With respect to the 2018-2019 school year, non-Emergent Bilingual students enrolled in Title I, Part A schools answered 0.88 more items correctly than did Emergent Bilingual students enrolled in Title I, Part A schools. Table 1 contains the descriptive statistics for this analysis.

Reading Reporting Category 3 Results Across all Three School Years

Next, ANOVA procedures were calculated for the STAAR Reading Reporting Category 3 for each school year. For the 2016-2017 school year, a statistically significant difference in Reading Reporting Category 3 for Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools was yielded, $F(1, 144820) = 783.82$, $p < .001$, partial $\eta^2 = .01$, small effect size. Concerning the 2017-2018 school year, a statistically significant difference was revealed on the Reading Reporting Category, $F(1, 117628) = 3{,}456.21$, $p < .001$, partial $\eta^2 = .03$, small effect size. With respect to the 2018-2019 school year, a statistically significant difference was again yielded on Reading Reporting Category 3, $F(1, 116172) = 2{,}347.96$, $p < .001$, partial $\eta^2 = .02$, small effect size. Effect sizes for Reading Reporting Category 3 were small for all three school years.

Concerning the 2016-2017 school year, non-Emergent Bilingual students enrolled in Title I, Part A schools answered 0.54 more items correctly than did Emergent Bilingual students enrolled in Title I, Part A schools. Regarding the 2017-2018 school year, non-

Emergent Bilingual students enrolled in Title I, Part A schools answered 1.16 more items correctly than did Emergent Bilingual students enrolled in Title I, Part A schools. With respect to the 2018-2019 school year, non-Emergent Bilingual students enrolled in Title I, Part A schools answered 0.92 more items correctly than Emergent Bilingual students enrolled in Title I, Part A schools. Revealed in Table 1 are the descriptive statistics for this analysis.

Grade Level Results

Student performance on the three STAAR grade level standards (i.e., Approaches Grade Level Standard, Meets Grade Level Standard, Masters Grade Level Standard) were examined through the use of Pearson chi-square procedures. This statistical procedure was the most appropriate statistical procedure to use because dichotomous data were present for all three STAAR Performance Standards (i.e., did not meet this standard or met this standard) and dichotomous data were present for Emergent Bilingual Status (i.e., Emergent Bilingual, non-Emergent Bilingual). As such, the chi-square is the preferred statistical procedure when variables are categorical (Field, 2018; Slate, 2023). The assumptions for utilizing a chi-square were met because a large sample size was present.

Approaches Grade Level Standard Results Across all Three School Years

With respect to the Approaches Grade Level Standard between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools, the result for the 2016-2017 school year was statistically significant, $\chi^2(1) = 1528.52$, $p < .001$. The effect size for this finding, Cramer's V, was small, .10 (Cohen, 1988). Statistically significantly higher percentages of non-Emergent Bilingual students enrolled in Title I, Part A schools met the Approaches Grade Level standard than Emergent Bilingual students enrolled in Title I, Part A schools. Approximately 10.5% more non-Emergent Bilingual students enrolled in Title I, Part A schools met this standard than Emergent Bilingual students enrolled in Title I, Part A schools. Readers are referred to Table 2 for the frequencies and percentages for the 2016-2017 school year.

Concerning the 2017-2018 school year, a statistically significant difference was present, $\chi^2(1) = 2787.74$, $p < .001$. The effect size yielded for this finding, Cramer's V, was small, .16 (Cohen, 1988). Statistically significantly higher percentages of non-Emergent Bilingual students enrolled in Title I, Part A schools met the Approaches Grade Level standard than Emergent Bilingual students enrolled in Title I, Part A schools. Approximately 15.3% more non-Emergent Bilingual students enrolled in Title I, Part A schools met this standard than Emergent Bilingual students enrolled in Title I, Part A schools. Delineated in Table 2 are the frequencies and percentages for the 2017-2018 school year.

Table 2

Frequencies and Percentages for the STAAR Grade 4 Reading Approaches Grade Level Standard for Emergent Bilingual and Non-Emergent Bilingual Students Enrolled in Title I, Part A Schools for the 2016-2017, 2017-2018, and 2018-2019 School Years

	Did Not Meet Standard		Met Standard	
Grade Level Standard, School Year, and Language Status	*n*	%	*n*	%
Approaches Grade Level				
2016-2017				
Non-Emergent Bilingual	30,939	31.1	68,545	68.9
Emergent Bilingual	18,871	41.6	26,467	58.4
2017-2018				
Non-Emergent Bilingual	20,417	24.9	21,367	75.1
Emergent Bilingual	14,368	40.2	39,872	59.8
2018-2019				
Non-Emergent Bilingual	17,687	22.3	61,619	77.7
Emergent Bilingual	12,473	33.8	24,395	66.2
Meets Grade Level	*n*	%	*n*	%
2016-2017				
Non-Emergent Bilingual	57,072	57.4	42,412	42.6
Emergent Bilingual	32,996	72.8	12,342	27.2
2017-2018				
Non-Emergent Bilingual	42,428	51.8	39,467	48.2
Emergent Bilingual	25,873	72.4	9,862	27.6
2018-2019				
Non-Emergent Bilingual	42,119	53.1	37,187	46.9
Emergent Bilingual	25,771	69.9	11,097	30.1
Masters Grade Level	*n*	%	*n*	%
2016-2017				
Non-Emergent Bilingual	76,385	76.8	23,099	23.2
Emergent Bilingual	40,265	88.8	5,073	11.2
2017-2018				
Non-Emergent Bilingual	61,406	75.0	20,489	25.0
Emergent Bilingual	31,782	88.9	3,953	11.1
2018-2019				
Non-Emergent Bilingual	60,411	76.2	18,895	23.8
Emergent Bilingual	32,543	88.2	4,334	11.8

Regarding the 2018-2019 school year, a statistically significant difference was present, $\chi^2(1) = 1740.48$, $p < .001$, small effect size, Cramer's V of .12 (Cohen, 1988). Statistically significantly higher percentages of non-Emergent Bilingual students enrolled in Title I, Part A schools met the Approaches Grade Level standard than Emergent Bilingual

students enrolled in Title I, Part A schools. Approximately 11.5% more non-Emergent Bilingual students enrolled in Title I, Part A schools met this standard than Emergent Bilingual students enrolled in Title I, Part A schools. Table 2 contains the frequencies and percentages for the 2018-2019 school year.

Meets Grade Level Standard Results Across all Three School Years

With respect to the Meets Grade Level Standard between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools, the result for the 2016-2017 school year was statistically significant, $\chi^2(1) = 3145.26$, $p < .001$. The effect size for this finding, Cramer's V, was small, .15 (Cohen, 1988). Statistically significantly higher percentages of non-Emergent Bilingual students enrolled in Title I, Part A schools met the Meets Grade Level standard than Emergent Bilingual students enrolled in Title I, Part A schools. Approximately 15.4% more non-Emergent Bilingual students enrolled in Title I, Part A schools met this standard than Emergent Bilingual students enrolled in Title I, Part A schools. Readers are referred to Table 2 for the frequencies and percentages for the 2016-2017 school year.

Concerning the 2017-2018 school year, a statistically significant difference was present, $\chi^2(1) = 4333.58$, $p < .001$. The effect size yielded for this finding, Cramer's V, was small, .19 (Cohen, 1988). Statistically significantly higher percentages of non-Emergent Bilingual students enrolled in Title I, Part A schools met the Meets Grade Level standard than Emergent Bilingual students enrolled in Title I, Part A schools. Approximately 20.6% more non-Emergent Bilingual students enrolled in Title I, Part A schools met this standard than Emergent Bilingual students enrolled in Title I, Part A schools.

Regarding the 2018-2019 school year, a statistically significant difference was present, $\chi^2(1) = 2921.61$, $p < .001$, small effect size, Cramer's V of .16 (Cohen, 1988). Statistically significantly higher percentages of non-Emergent Bilingual students enrolled in Title I, Part A schools met the Meets Grade Level standard than Emergent Bilingual students enrolled in Title I, Part A schools. Approximately 16.8% more non-Emergent Bilingual students enrolled in Title I, Part A schools met this standard than Emergent Bilingual students enrolled in Title I, Part A schools.

Masters Grade Level Standard Results Across all Three School Years

With respect to the Masters Grade Level Standard between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools, the result for the 2016-2017 school year was statistically significant, $\chi^2(1) = 2876.37$, $p < .001$. The effect size for this finding, Cramer's V, was small, .14 (Cohen, 1988). Statistically significantly higher percentages of non-Emergent Bilingual students enrolled in Title I, Part A schools met the Masters Grade Level standard than Emergent Bilingual students enrolled in Title I, Part A schools. Approximately 12.0% more non-Emergent Bilingual students enrolled in Title I, Part A schools met this standard than Emergent Bilingual students enrolled in Title I, Part A schools. Revealed in Table 2 are the frequencies and percentages for the 2016-2017 school year.

Concerning the 2017-2018 school year, a statistically significant difference was present, $\chi^2(1) = 2943.98$, $p < .001$. The effect size yielded for this finding, Cramer's V, was small, .16 (Cohen, 1988). Statistically significantly higher percentages of non-Emergent Bilingual students enrolled in Title I, Part A schools met the Masters Grade Level standard than Emergent Bilingual students enrolled in Title I, Part A schools. Approximately 13.9% more non-Emergent Bilingual students enrolled in Title I, Part A schools met this standard than Emergent Bilingual students enrolled in Title I, Part A schools. Delineated in Table 2 are the frequencies and percentages for the 2017-2018 school year.

Regarding the 2018-2019 school year, a statistically significant difference was present, $\chi^2(1) = 2292.04$, $p < .001$, small effect size, Cramer's V of .14 (Cohen, 1988). Statistically significantly higher percentages of non-Emergent Bilingual students enrolled in Title I, Part A schools met the Masters Grade Level standard than Emergent Bilingual students enrolled in Title I, Part A schools. Approximately 12.0% more non-Emergent Bilingual students enrolled in Title I, Part A schools met this standard than Emergent Bilingual students enrolled in Title I, Part A schools. Table 2 contains the frequencies and percentages for the 2018-2019 school year.

Discussion

The number of Texas public school students enrolled in Title I, Part A schools has increased considerably over the past decade. Of the years examined in this investigation, nearly 65% of Texas public school students were identified as Title I by the Texas Education Agency (Texas Education Agency, 2021a). In this investigation, the Grade 4 STAAR Reading performance was compared between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools for the 2016-2017, 2017-2018, and 2018-2019 school years. Statistically significant results were present in all three school years. Following these statistical analyses, the three performance standards were examined and yielded statistically significant results in all three school years. Lower percentages of Emergent Bilingual students enrolled in Title I, Part A schools met the Approaches Grade Level standard compared to non-Emergent Bilingual students enrolled in Title I, Part A schools. Differences in percentages between Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools not meeting the Approaches Grade Level standard were 10.5%, 15.3%, and 11.5%, respectively for the three school years examined.

Differences also existed in the percentages of Emergent Bilingual and non-Emergent Bilingual students who met the Meets Grade Level standard. Lower percentages of Emergent Bilingual students enrolled in Title I, Part A schools earned the Meets Grade Level standard than non-Emergent Bilingual students enrolled in Title I, Part A schools. Differences were 15.4%, 20.6%, and 16.8%, respectively for the three school years examined. Similarly, differences also existed in the percentages of Emergent Bilingual and non-Emergent Bilingual students who met the Masters Grade Level standard. Lower percentages of Emergent Bilingual students enrolled in Title I, Part A schools earned the Masters Grade Level standard than non-Emergent Bilingual students enrolled in Title I, Part A schools. Differences were 12.0%, 13.9%, and 12.0%, respectively for the three school

years examined. In examining the reading performance of Grade 4 Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools in Texas across the three years of data that were analyzed herein, consistent trends were identified.

Connections with Existing Literature

Of the 5.4 million students currently served in Texas public schools, over 20% identify as Emergent Bilingual (Texans Care for Children, 2023, para. 7). According to the Texas Education Agency (2023), "This trend has resulted in an increase in Hispanics, the largest ethnic group, comprising over 52% of the state's population, making Spanish-speakers the largest language group served in schools, at 92%" (Senate Bill 560 Emergent Bilingual Strategic Plan, p. 2). Although this population of students continues to grow, the opportunity gaps between students who are Emergent Bilingual and students who are non-Emergent Bilingual continue to be reflected in reading achievement data. Quintero and Hansen (2017) have pointed to lack of teacher preparation for these disparities. They noted that policies at the state and federal level, as well as teacher preparation programs "have not sufficiently prioritized training teachers for this growing segment of the student population, and teachers are, therefore, left unprepared in the classroom" (Brown Center Chalkboard, 2017, para. 2). Results of this multiyear, statewide investigation are commensurate with the outcomes of other researchers (Harris, 2018; Mason, 2022) who demonstrated the presence of lower academic performance for students in poverty compared to students not in poverty. This investigation on differences in reading performance expanded on the work of previous researchers (Resilla & Slate, 2023; Sáenz, 2022; Schleeter, 2017) who investigated differences in the reading performance of Emergent Bilingual students in Texas.

Implications for Policy and Practice

As outlined in this statewide, multiyear investigation, the intersection of language status and poverty has a negative influence on student reading performance. Based upon these findings, implications for policy can be generated. First, policymakers should require the Texas Education Agency to annually compile a list of research-based resources and strategies that school districts can select from when determining how best to support the language acquisition needs of Emergent Bilingual students. Second, policymakers should consider adopting comprehensive statewide systems of support for ensuring Emergent Bilingual students are able to demonstrate mastery of language acquisition similar to that of their peers who are not Emergent Bilingual.

Implications for practice can also be made. First, it is imperative school leaders establish a process that includes timely instruction, assessment, and intervention for Emergent Bilingual students to ensure continued progress toward identified language acquisition goals. Second, to prepare teachers to provide high-quality instruction and intervention, school leaders should develop a comprehensive professional development plan that focuses on implementing research-based linguistic strategies into daily classroom instruction. Third, data collected from formative and summative assessments

should be utilized to adjust instruction and assessment accordingly.

Recommendations for Future Research

Recommendations for future research investigations can be made given the results of this empirical investigation. Researchers should determine if similar achievement gaps exist in other grade levels or within other ethnic groups. In addition, researchers should examine how gender may affect the reading achievement of Emergent Bilingual students differently and determine if there are additional underlying factors that contribute to these differences. Data for this study were limited to the State of Texas. The extent to which the results of this study can be generalized to other states is unknown. Accordingly, it is recommended that researchers conduct this study in other states using state-mandated exams to determine if similar trends exist.

Conclusion

The purpose of this investigation was to ascertain the extent to which differences were present in reading between Texas Grade 4 Emergent Bilingual and non-Emergent Bilingual students enrolled in Title I, Part A schools for three school years. Consistent with previous researchers (Resilla & Slate, 2023; Sáenz, 2022; Schleeter, 2017), non-Emergent Bilingual students enrolled in Title I, Part A schools outperformed Emergent Bilingual students enrolled in Title I, Part A schools in the Reading Reporting Categories and the performance standards in all three school years.

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Exploring the Perception of Middle School Parents Regarding Parental and Community Involvement

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This qualitative research explored how the perception of middle school parents regarding parental and community involvement in various District Reference Groups (DRG) classifications impacts parental involvement. Particularly, the findings from reflexive thematic analysis of the parent interview data were organized to help educational leaders and educators gain a deeper understanding of key issues related to parental involvement and perception. The results indicate the challenges and/or obstacles concerning parental involvement that middle school parents may have experienced across the various school settings. Moreover, the results show what specific resources and support school districts can provide to encourage parent involvement in different school profiles. Thus, the implications for practice recommended in this study may provide school districts with strategies to act preventively through a partnership promoting parent and community awareness of the importance of their involvement in education.

Keywords: Parent Perception, Parental Involvement and Middles School

Introduction

Although the decline in academic achievement following the COVID-19 Pandemic continues to be a major concern, social-emotional well-being as well as the rise in behavioral issues since the return to school need to be addressed. In addition, educational leaders may face the challenge of creating a "climate of care" (Soalt & Nolan, 2020, "Enact Kindness" section) in their organization. However, it may be beneficial for educators to have a better understanding of how parents may contribute to their child's overall learning environment (Grusec & Danyliuk, 2014; Haimovitz & Dweck, 2016; Yulanti et al., 2020) in school. Caño et al. (2016) proposed that, "Parents have a well-built influence on the learning of their children and are labeled as the first teachers and role models for their children" (p. 145). Therefore, it is crucial to explore parental perception, which may be defined as how a parent views their child's education, for school improvement and student success. Taylor (2019) defined perception as a "way of regarding, understanding, or interpreting something" (para 2). This qualitative study explored the connection between middle school parent perception and parental involvement.

The Impact of COVID-19 on Schools and Parents

Across the country, educational institutions, district leaders, and teachers are held responsible for narrowing the achievement gap between disadvantaged and advantaged students (Kuhfeld et al., 2020; Kuhfeld & Tarasawa, 2020). At the same time, there are limitations school systems have due to factors that occur outside of educational institutions. There may be factors that contribute to the achievement gap in schools that are shown to have not only a greater impact than schools, but that are in place before the child becomes of school age; before ever entering a school (Berliner, 2009; Caño et al., 2016; Örnek, 2015).

Education has changed; and although curriculum, standards, and technology have all advanced, the achievement gap continues to grow (Kuhfeld & Tarasawa, 2020; Weller, 2017). At the same time, there is a growing concern in many districts regarding the decline in parental involvement (Dwyer & Hect, 1992; Gentry, 2011; Weller 2017). However, educational leaders are expected to cultivate and support a positive school culture while faced with the challenge of a continuous changing climate (Anwar, 2021). In 2020, a global pandemic thrust educators, students, and their families into the most unprecedented time in the history of education (Camera, 2022; Kuhfeld et al., 2020; Kuhfeld & Tarasawa, 2020). Kuhfeld and Tarasawa (2020) proposed the "*COVID slide*", estimating that students in some grade levels may return nearly a year behind; predicting that socioeconomic status-based achievement gaps would be even wider (Kuhfeld et al., 2020).

Parental Involvement and Parental Perception

Most research data on school climate targets students and teachers, however parental perception also matters. According to Dean et al. (2019), the concept of perception impacting student success has been around a long time in educational

research, although "as a construct, it has been aimed at discovering how *students* feel about their ability to learn" (p. 324). Conversely, Schueler et al. (2014) proposed that it may be parental perception that ultimately impacts student achievement in three ways: (1) parental perception of school climate may influence their students' perceptions of the school; (2) parental perception of school climate may impact parental involvement; and (3) parental perception of a school impacts not only the decision of where their children will attend school, but also the town chosen to reside. Consequently, parental influence may be a key factor in school climate and culture (Caño et al., 2016; Derler, 2019; Schueler et al., 2014; Yamamoto & Holloway, 2010).

Parent Involvement and Parent-Child Communication

In a previous study examining the relationship between parental involvement and student achievement, Topor et al. found that not only is there an association between parental involvement and the academic achievement of their child, but that the impact of this association is over and above that of the child's cognitive ability (2010). However, parental involvement is difficult to define, for it may mean different things to different parents (Kantova, 2024; Stanford, 2023). According to the United States of Department of Education (2004) parental involvement is defined as the participation of parents in regular, two-way, meaningful communication involving student academic learning and other school activities" (United States of Department of Education, 2004).

Due to the lack of clarity on the exact mechanisms of parental involvement in previous research that has examined the impact parental involvement has on student achievement (Stelios, 1992), and the growing concern in many districts regarding the decline in parental involvement (Dwyer & Hect, 1992; Gentry, 2011; Weller 2017; Yulanti et al., 2020), educators may benefit from a further understanding of the parental perception in their school/school district. Justice et al. (2020), proposed that parental mindset is related to parental involvement, and that a parents' growth (effort) mindset may be a significant predictor of both family learning activities and time invested by the parent.

The way in which a parent communicates with their child and the mindset they model is just as important as the parent communicating the importance of education to their child (Grusec & Danyliuk, 2014; Haimovitz & Dweck, 2016; Justice et al., 2020; Mueller et al., 2017; Örnek, 2015). According to Yamamoto and Holloway (2010), in addition to parental involvement, the communication of parental expectations to their children may indeed convey messages about their abilities and capabilities, which may enhance students' competency beliefs and sense of efficacy, affecting student achievement.

Therefore, how parents communicate their education mindset, the beliefs and/or expectations about their child(ren)'s school/school districts may convey messages to their child about the school/school district's ability to provide a meaningful education (Grusec & Danyliuk, 2014; Haimovitz & Dweck, 2016; Mueller et al., 2017). Parental involvement may be a mitigating factor related to the achievement gap. According to Caño et al. (2016), "Parents have a well-built influence on the learning of their children and are labeled as the first teachers and role models for their children" (p. 145), further supporting the impact

parental involvement has on student achievement (Brannon, 2007).

Methodology

This manuscript was adapted from a dissertation for submission to the journal. Originally, the full dissertation utilized a mixed methods exploratory design. Adapting the content involved condensing and refining the results to fit the length and scope requirements of a journal. Therefore, in this study, only the qualitative part of the dissertation research was presented. In this study, we used a qualitative approach and conducted individual interviews of parent participants (n = 7) to explore the relationship between parental perception and parental involvement of middle school student parents. The interviews provided further insight into the relationship between parental perception and parental involvement, as well as a deeper understanding of the following factors: educational opportunities, definition of parental involvement, and perceived challenges and support provided their school district and community.

Purpose and Research Question

To examine the relationship between parental perception and parental involvement, as well as to develop a deeper understanding of the following factors: educational opportunities, the definition of parental involvement, and parents' perceived challenges and support provided by their school district and community, the following main qualitative research question was developed "How does the perception of middle school parents regarding parental and community involvement in District DRG classifications impact parental involvement?"

In addition, there were only a total of 7 participants, we utilized the qualitative data from three DRG B parent interviews and four DRG E parent interviews to address the following sub-qualitative questions: (1.a) What are the opinions of different DRG middle school parents regarding the definition of educational opportunities? (1.b) How do middle school parents from different DRGs define and rate their parental involvement activities? (1.c) What challenges and/or obstacles concerning parental involvement have middle school parents experienced across the DRG classification? (1.d) What resources and support school districts can provide to encourage parent involvement in different DRGs? (1.e) How is community involvement described by middle school parents across DRG classification?

Participant Sample

To minimize class bias, we examined school districts representing student populations that have differing demographics in the state of Connecticut. The participant sample consisted of seventh and eighth grade student parents from three school districts, one school district classified as DRG B (High Parent Income), one school district classified as DRG E (Mid Income), and one school district classified as DRG H (Low Income). The DRG classification is determined by the Connecticut State Department of Education using

seven indicators: three indicators of socioeconomic status (median family income, parental education, and parental occupation), three indicators of need (percentage of children living in families with a single parent, the percentage of public school children eligible to receive free or reduced-price meals, and percentage of children whose families speak a language other than English at home) and enrollment (the number of students attending schools in that district). School districts are grouped from DRG A –DRG I; the low-need districts representing a higher socioeconomic status start with DRG A using the stated indicators, while the highest need districts are grouped as DRG I (Connecticut Voices for Children, 2006).

We conducted individual parent interviews to explore middle school parent perception of parental involvement and provide further insight into the relationship between parental perception and parental involvement**.** This approach allowed not only for an individual to share how their perception of school climate developed, but also a more open exchange allowing for clarification or prompting of further detail of answers on how they might communicate that perception (mindset) to their children. Data collected from the interviews provided further insight into the relationship between parental perception and parental involvement, as well as a deeper understanding of the following factors: educational opportunities, definition of parental involvement, as well as their perceived challenges and support provided by both their school district and community. Though a possible known limitation of this method points to the data collected as being filtered through the participant's perception (Creswell & Creswell-Baez, 2021). Thus, the research question may indeed only be answered by recording exactly that, how each participant defines parental involvement**.**

Instrument

We utilized the data collected from the individual parent interviews as the qualitative data. We utilized the following interview questions with all participants.

- *Tell me about your child's school.*
  - *How long has your child attended school in district / their current school?*
- *Does your child have access to educational opportunities? and how would you describe such opportunities?*
- *Do you believe parental involvement is important? How do you define parental involvement?*
- *How would you rate your level of parental involvement on a scale of 1-4?*
  - *Not involved=1, Somewhat Involved =2, Involved =3, Extremely Involved =4*
  - *(probe) Has your level of involvement changed over the years?*
- *What obstacles have you experienced concerning parental involvement?*
  - *(probe) Were those obstacles classroom, school based, or at a district level?*
- *Based on your experience, what can the school system actively do to encourage parental involvement?*
- *What resources do you feel your child's school should provide to families?*

- *How would you describe community involvement with your school district?*
  - *(probe) what would you consider to be an example of community involvement?*
- *What assumptions or opinion about your local school district do you believe to be held by your community, including town officials, local businesses, and residents towards your school district?*
  - *(probe) Can you share a specific example that support your belief?*

We then replayed the interview recordings to clean the data and fill in any missing data lost in transcription by hand. After cleaning and de- identification, the data were coded. Lastly, we ensured that all data omitted personally identifiable information and that participants were allocated a number and DRG classification. The ZOOM platform was used to record and transcribe all interviews.

Data Analysis

We took a qualitative approach and conducted a reflexive thematic analysis of the interview data collected (see Table 1) from each participant.

According to Braun and Clarke (2022), although there are several varieties as well as procedures for thematic analysis, the purpose is to develop themes. Reflexive thematic analysis is reflective of one's knowledge and interpretation, conducted at the intersection of: (1) the dataset; (2) the theoretical assumptions of the analysis; (3) the analytical skills/resources of we (Braun & Clarke, 2019). However, it should be noted that this approach does not offer rules or steps for we to follow, only guidelines for the process; the primary tool for reflexive thematic analysis is researcher subjectivity (Braun & Clarke, 2022). Particularly, we used the following steps:

> ***Phase 1: Familiarising yourself with the dataset.*** During the first phase of the process, we read then re-read the recorded interview transcript data making notes and insights.
> ***Phase 2: Coding.*** In phase 2 of the reflexive thematic analysis we began coding, to identify segments of data that had meaning or was relevant to the research questions.
> ***Phase 3: Generating initial themes.*** During phase 3, we generated initial themes as they started to identify patterns and clusters of codes around various concepts.
> ***Phase 4 Developing and reviewing themes***. During phase 4, we went back to the data to ensure that each theme and code described in phase 3 made sense and highlighted the most important data (Braun & Clarke, 2022).
> ***Phase 5: Refining, defining, and naming themes.*** During phase 5, we further refined the analysis to ensure each theme was clearly established and defined (Braun & Clarke, 2022).
> ***Phase 6: Writing up.*** During Phase 6, we interpreted the data in a more meaningful way, weaving together data extracts in an analytic narrative to further address the research questions (Braun & Clarke, 2022).

Findings

This section discusses the findings for the qualitative research question, how does the perception of middle school parents change before pre-COVID and post-COVID regarding parental and community involvement within and across the DRG classifications? We conducted a code frequency analysis of participant data using the software program MAXQDA Analytics Pro 2022. The data collected consisted of all responses to each of the following sub-qualitative questions are presented in detail: (1.a) What are the opinions of different DRG middle school parents regarding the definition of educational opportunities? (1.b) How do middle school parents from different DRGs define and rate their parental involvement activities? (1.c) What challenges and/or obstacles concerning parental involvement have middle school parents experienced across the DRG classification? (1.c) What resources and support school districts can provide to encourage parent involvement in different DRGs? (1.e) How is community involvement described by middle school parents across DRG classification?

What are the opinions of different District Reference Group (DRG) middle school parents regarding the definition of educational opportunities?

We found school climate as an emerging theme, identifying educational opportunities as an emerging subtheme. To gain a better understanding of how parent define educational opportunities, we conducted a second data cycle that involved specificity and frequency of codes related to educational opportunities, identifying two codes that emerged: educational opportunities: enrichment opportunities and remedial support. Enrichment is described as opportunities to enhance a student's learning through various academic challenges (Lynch, 2020). Remedial support refers to programs and curriculum designed to close achievement gaps as well as address psychosocial needs the student may have (Taukeni, 2019). Across both DRG B (High Income District) and DRG E (Low Income District), remedial support had a 29% code frequency, and enrichment opportunity had a 71% code frequency.

Although, it should be noted that 100% of parent participants recruited from DRG B equated educational opportunities as enrichment, and 0% referenced remedial support. When asked to describe the educational opportunities available to their child, DRG B Parent Participant 2 only indicated enrichment opportunities, stating that, "there is no gifted and talented program at the elementary level, in middle school it starts, then they do have access to higher level classes. I think from seventh grade and after, but he suffered quite a lot by boredom" (DRG B Parent Participant 2 Interview Transcription, p. 1). During the interview process when asked, "*would you say that your child has access to educational opportunities? and how would you describe such opportunities?"* DRG B Parent Participant 1, only referred to enrichment programming as educational opportunities as well, "I think his trajectory is sort of heading in that direction. As he moves from middle school and into high school, there's certainly AP courses for him in high school and even an international baccalaureate program which is above that" (DRG B Parent Participant 1 Interview Transcription, p. 1).

However, DRG B Parent Participant 4 felt that though the district does usually offer enrichment, the COVID-19 Pandemic may have been a mitigating factor, “I think it's just the timing of COVID. Those high expectations teaching that we often like to talk about, not that teachers didn't have high expectations, but I think they were different. So, I'm definitely seeing the ramifications” (DRG B Parent Participant 4 Interview Transcription, p. 1).

Although, 67% of parents recruited from DRG E referenced remedial support when asked about educational opportunities, while only 33% spoke about enrichment opportunities. According to DRG E Participant 2, “I would describe educational opportunities as experiences to strengthen his interests as well as areas that he would grow in (DRG E Parent Participant 2 Interview Transcription, p. 1). DRG E Participant 1 shared, “my son had a speech delay early on, and needed extra intervention for that, and they helped him through elementary school with that. And now in the middle school he gets RTI intervention for reading, and comprehension” (DRG E Parent Participant 1 Interview Transcription, p. 1). Overall, participants described of a restriction to educational opportunities in earlier grades, indicating that they begin to open in middle school and increase as one enters high school. According to DRG B Participant 3 “I think they're a little bit more restricted in what they can teach as far as the extent and flexibility of what to provide for the younger grades" (DRG B Parent Participant 3 Interview Transcription, p. 1).

How do middle school parents from different District Reference Group’s (DRG) define and rate their parental involvement activities?

We found parental involvement as an emerging theme, identifying the definition of parental involvement as an emerging subtheme. However, we found that definitions of parental involvement varied among participants. Therefore, to gain a better understanding of how parents defined parental involvement, we conducted a second data cycle that involved specificity and frequency of codes related to defining parental involvement, two codes 1. internal and 2. external emerged under the subtheme level of parental educational involvement. Internal reflects parental involvement learning at home, including strategies and practices that the parent implements at home. External reflects parental educational involvement outside of the home, including volunteering and decision making at school, such as opportunities to participate at the at the district, school, and classroom level. According to United States of Department of Education (2004), parental involvement is defined as the participation of parents in regular, two-way, meaningful communication involving student academic learning and other school activities. Although, the definition of parent involvement varies across research, (a) learning at home; and (b) volunteering and decision making at school, have been identified as two types (Stelios, 1992).

Overall, looking at how parents defined parental involvement in both DRG B and DRG E, there was an 86% code frequency of internal parental involvement at home and a 57% code frequency of external parental involvement outside of the home. Therefore, to determine how different DRGs define and rate their parental involvement activities, we then looked at data collected from parents in each DRG separately. We first looked at the

transcripts of parent interviews from DRG B, finding a 100% code frequency for internal parental involvement/learning at home; and a 50% code frequency of external parental involvement – volunteering and decision making at school, such as opportunities to participate at the at the district, school, and classroom level. Although a few DRG B parent participants referenced outside of the home practices as being related to parental involvement, all DRG B parent participants emphasized parental involvement practices at home. DRG B Parent Participant 1 referenced internal parental involvement as "time to get their kids up on time and get them to school, maybe they don't show up to an open house but that that doesn't mean they're not involved and working a lot behind the scenes" (DRG B Parent Participant 1 Interview Transcription, p. 2).

DRG B Parent Participant 4 also referenced internal parental involvement noting that parental involvement is more than just being a member of the PTO, "I personally think it involves not just the final PTO types of things that we do as a school district but that academic piece and being connected to the student's education" (DRG B Parent Participant 4 Interview Transcription, p. 1). DRG B Parent Participant 3 also described "internal parental involvement" indicating that it is just being there for their children, "helping in their educational and peer situation, I don't particularly enjoy like the PTO, running committees, or the social stuff and the hanging out all the time like that's just sort of not who I am kind of thing" (DRG B Parent Participant 3 Interview).Lastly, although DRG B Parent Participant 2 did not highlight internal parental involvement, they did explicitly express that external parental involvement in the schools should actually be less, concerned that schools were becoming too much like a home environment,

Sometimes, I feel like in the elementary level the involvement sometimes is more than it should be. I think that there should be less physical presence of parents in school and certainly more parental involvement in supporting the school in educating the children. (DRG B Parent Participant 2 Interview Transcription, p. 1)

In looking at DRG E participant interview data, the code frequency was 67% for both internal parental involvement at home and external parental involvement outside of the home.

According to DRG E Participant 2, parental involvement in their child's education could be defined in many ways, "Parental involvement is from the very minute, making sure they're packed up, rested and clean, ready to go in the morning, to help making sure homework is done, studying is done, extracurricular activities are included in their school life "(DRG E Parent Participant 2). DRG E Participant 3 expressed the importance of a school-home collaboration when asked to define parental involvement, "I would define parental involvement with where the parents or guardians of students, and staff and administration at the school. There is collaboration so that students see that it's a community kind of working together for them to succeed" (DRG E Parent Participant 3 Interview Transcription, p. 1).

During the interview process, we additionally asked each parent participant if they felt parent involvement was important, and to rate their level of parental involvement on a scale of 1-4 for, with 4 being extremely involved, 3 being involved, 2 being somewhat involved and 1 being not involved. The analysis found that 100% of all participants recruited from both DRG B and DRG E school districts responded that they believed

parental involvement to be important, with all participants reporting their level of parental involvement as a three.

What challenges and/or obstacles concerning parental involvement have middle school parents experienced across the DRG classification?

We examined the data related to the level of parental involvement, to determine if participants reported that it has changed over the years, and what challenges/barriers may be factors. In examining the interview data to determine if the level of parental involvement has ever changed, we conducted a second data cycle that involved specificity and frequency of codes related to level of parental involvement, finding two codes to emerge: 1. A decrease in parental involvement upon entering middle school and 2. A consistent level of parental involvement through the years. We found that only one parent participant from DRG B reported a decrease in their level of parent involvement, stating that it was due to a decrease in opportunity. DRG B Participant 4 shared, "I am connected just by virtue of being an educator in the district and I think there's a massive disconnect once the kids get to Middle School. It feels like once they leave elementary school there is a drop off once you get to sixth grade" (DRG B Parent Participant 4 Interview Transcription, p. 2).

We found that three out of four DRG B parent participants reported no change in the level of parental involvement when their child entered middle school. For instance, during the interview process when participants were asked *"Has your level of involvement changed over the years?"* DRG B Parent Participant 3 answered "No" (DRG B Parent Participant 3 Interview Transcription, p. 2); DRG B Parent Participant 1 noted "No although I feel, like with having two, two kids there were times when I needed to maybe step in more with one than the other but I would look at like my level of interest involvement is the same" (DRG B Parent Participant 1 Interview Transcription, p. 2); and DRG B Parent Participant 2 stated "Throughout the years, well I stepped in when I thought I was needed" (DRG B Parent Participant 2 Interview Transcription, p. 2).

However, we found that all parent participants from DRG E reported a decrease in their level of parent involvement once their child entered middle school. According to DRG E Participant 2, "In the beginning when he was in his more elementary type of school full year there was a greater invitation I'd say to come in and support school-based programs" (DRG E Parent Participant 2 Interview Transcription, p. 2); DRG E Participant 1 noted "Going into middle school. It's a little bit less" (DRG E Parent Participant 1 Interview Transcription, p. 2). DRG E Participant 3 stated,

I think you felt there was less when you got to the middle school, there was less parental involvement in term of going into the building. Naturally as children get older, they become a little more independent, while we're still involved the children become their own advocates in some aspect and as they're developing, it's our goal (DRG E Parent Participant 3 Interview Transcription, p. 2).

We then further examined the level of parental involvement as an emerging theme, finding challenges/obstacles to be an emerging subtheme. Then after conducting a second data cycle that involved specificity and frequency of codes related to challenges and obstacles, we found the following codes to emerge: opportunity, availability, time, other

parents and COVID-19. We describe these factors as either challenges or barriers to parental involvement. The findings show that parent participants across DRGs noted several obstacles to parental involvement.

Opportunity

Participants expressed a reported drop in opportunity once their child entered middle school. DRG B Participant 4 felt there was not enough opportunity at the middle school level, “I always think about my friends who have kids who have never stepped foot at the middle school, I think there would be a sense of connectedness if they would do some of those outreach kind of community things” (DRG B Parent Participant 4 Interview Transcription, p. 3). DRG E Participant 1 stated that, “It's really hands off unless you're in the PTO. It's just a tough age. I don't even know what they could do. There is not like a big push, but I also think that a lot of it is based on age” (DRG E Parent Participant 1 Interview Transcription, p. 3). DRG E Participant 3 shared, “I think naturally as the children get older, they become a little more independent, and while we’re still involved, the children become their own advocates in some aspect as they're developing, it's our goal” (DRG E Participant 3 Interview Transcription, p. 2).

Availability and Time

The data analysis of the parent interview transcript data also found factors such as time, availability, and even other parents to be obstacles. DRG B Participant 3 responded, “I mean there have been times where I’ve had to take an hour off work to go to PPT, I mean it might be very different for a lot of people who didn't sort of have the flexibility that I have” (DRG B Participant 3 Interview Transcription, p. 2). DRG E Participant 2 also highlighted that time may be an obstacle, **“**Time, I’d say time. It was definitely convenient to be able to zoom some of these meetings instead of personally getting there, but as my son gets older, he's more and more involved in activities. I think time is a constraint” (DRG E Parent Participant 2 Interview Transcription, p. 2).

COVID-19 Pandemic

Additionally, the COVID-19 Pandemic was noted as its own factor as an obstacle for parental involvement. The COVID-19 Pandemic was mentioned by several participants as being a factor that impacted their level of parental involvement. According to DRG E Participant 2, “obviously COVID happened so for the first year in the middle school, parents were not allowed to be as involved, you couldn’t enter the school building last year as a parent, so I felt less involved because of that” (DRG E Participant 2 Interview Transcription, p. 2). DRG E Participant 1 agreed, “Covid kind of shut the parents out a little bit. So, they're slowly starting to get back in. But for the middle school we're like not even existent” (DRG E Participant 1 Interview Transcription, p. 2). DRG E participant 3 also stated that the COVOD-19 Pandemic may have been a factor, “my younger child started during the pandemic, so I feel that was a factor” (DRG E Participant 3 Interview). However,

although DRG B Participant 4 indicated that the COVID-19 Pandemic was a factor, there are other obstacles that remain, **"**COVID played a part, where parents just weren't in the buildings at all, so that didn't help the middle school piece of it, but then I think other obstacles are what I don't see happening there" (DRG B Parent Participant 4 Interview Transcription, p. 2). Overall, the data analysis of the parent participant interview transcript data also found factors such as opportunity, time, availability, the COVID-19 Pandemic, and even other parents to be obstacles.

What resources and support school districts can provide to encourage parent involvement in different DRGs?

We found school climate as an emerging theme, identifying both resources and support and communication and opportunity as emerging subthemes. We then reexamined the data to better understand parental perspective of the resources and support provided by their child's school and conducted a second data cycle that involved specificity and frequency of codes related to resources and support, identifying two codes that emerged: (1) Satisfied and (2) Dissatisfied. Satisfied represents parental perceived satisfaction of resources and support parents that their schools provide to encourage parental involvement. Dissatisfied represents parental perceived dissatisfaction of resources and support parents that their schools provide to encourage parental involvement. We then looked at each DRG separately to determine if there was a difference in parent perception of the resources and support provided by each school district.

In DRG B, the findings show that although half the participants were satisfied with the school district, the other half were not. According to DRG B Participant 1, "I think there's a high level of involvement when it comes to their PTOs. I think they're very active and engaged in in a variety of activities and fundraisers, and also being involved in some of the curriculum choices and approaches" (DRG B Parent Participant 1 Interview Transcription, p. 3). DRG B Participant 4 shared, "I feel like in some ways we're lucky, there's a lot available to us. For example, our website is very well done at the district level so there are opportunities, if any parent wants to read our views on curriculum" (DRG B Parent Participant 4 Interview Transcription, p. 3).

The data analysis of the DRG E parent participant interview transcription indicates that parental perception of the resources and support provided by the school district is mostly dissatisfied. According to DRG B Participant 3, "I think giving the parents a voice in what's happening in the school. I think there may be other ways they can do that more efficiently. One way they are doing this year is the opportunity for parents to come in for breakfast but there are parents who are working" (DRG B Parent Participant 3 Interview). DRG E Participant 1 added, "I mean they have PTO meetings but should make these meetings more, I don't know, people don't go to them, they need to be more engaging. They just don't enough fun stuff for these kids that I think they lose parents" (DRG E Participant 1 Interview Transcription, p. 3). Although DRG E Participant 1 indicated that this perception may be due to the comparison with their child's previous school, "We came from an elementary school that was very involved and very hands on to this; it's a lot more laxed in

the middle school. When your kid is in seventh and eighth grade, you're kind of like all right, I'm over it" (DRG E Participant 1 Interview Transcription, p. 3).

Overall, parent participants emphasized the availability and flexibility of opportunities for parental involvement at school, so that parents who work during the day can actively participate. In addition, parent participants indicated that they no longer felt as welcome at the school after their child moved on from elementary school. Lastly, the district's/school's communication about parental involvement opportunities could be improved as well.

How is community involvement described by middle school parents across DRG classification?

We found community engagement to be an emerging theme in the data, and level of community involvement as an emerging subtheme. In examining the interview data to better understand parental perception of community's support and involvement in their school district, we found two codes related to community involvement to emerge 1. Satisfied and 2. Dissatisfied. Satisfied represents parental perceived satisfaction of their community's support and involvement in their school district. Dissatisfied represents parental perceived dissatisfaction of community support and involvement in their school district. Overall, we found that all parent participants across DRG B and DRG E were satisfied with the level of community support and involvement in their school district.

DRG B Participant 1 stated "I think the community involvement is excellent" (DRG B Participant 1 Interview Transcription, p. 3). DRG B Participant 2 described community involvement as, "Oh my god, it's overwhelming okay, everyone wants to participate and be heard, and it is good I mean it's good. I might not agree with everything that's all but there's a lot of participation" (DRG B Participant 2 Interview Transcription, p. 3); and DRG E Participant 3 shared that "I definitely think there is a community factor, especially being a small community" (DRG E Participant 3 Interview Transcription, p. 3).

However, we found that the participants may have interpreted community involvement opportunities differently. Therefore, we took a closer look at the examples of community involvement referenced by the parent participants to examine parental perception of community involvement and found two codes to emerge (1) community involvement practices; and (2) community resources and support. Table 1 summarizes the emergent themes and selected codes.

Table 1

Summary of Emergent Themes of Sub-Qualitative Research Questions

Theme	Sub-Themes and Codes
RQ 1a. What are the opinions of different DRG middle school parents regarding the definition of educational opportunities? Middle school parents' perception of educational opportunities	Educational Opportunities Remedial Enrichment
RQ 1b. How do middle school parents from different DRG define and rate their parental involvement activities? Middle School parents' perception of parental Involvement	Parental Involvement Internal Parental Involvement External Parental Involvement
RQ 1c. What challenges and/or obstacles concerning parental involvement has middle school parents experienced across DRG classification across the DRG classification? Middle school parents' perception of obstacles and challenges to parental involvement	Level of Parental Involvement Challenges/Obstacles *Availability * Time * Other Parents *COVID-19 Pandemic
RQ 1d. What resources and support school districts can provide to encourage parent involvement in different DRGs? Middle school parents 'perception of the resources and support provided by their school district	Resources & Supports Communication Opportunities
RQ 1e. How is community involvement described by middle school parents across DRG classification? Middle school parents' perception of community engagement	Community Involvement Community Involvement Practices Community Resources & Support

Discussion

Defining Educational Opportunities

Educational opportunities were found to be defined by the parents interviewed in this study as either: 1. Enrichment - described as opportunities to enhance a student's learning through various academic challenges (Lynch, 2020); or 2. Remedial support - referring to programs and curriculum designed to close achievement gaps as well as address psychosocial needs the student may have (Taukeni, 2019). We found that educational opportunities were defined as enrichment by all four participants from DRG B; it was noted that the pandemic may have been a mitigating factor for some programming. In DRG E, one participant defined educational opportunities solely as remedial support, while the other two participants mentioned both enrichment and remedial support when defining educational opportunities.

Defining Parental Involvement

We found that parental involvement was defined as at home, including strategies and practices that the parent implements at home (internal parental involvement), and outside of the home, including volunteering and decision making at school, such as opportunities to participate at the at the district, school, and classroom level (external parental involvement). We were not surprised by these findings being that the definition of parent involvement varies across research. As noted in chapter 2, parental involvement practices are not only difficult to define because they have been defined so broadly, they also have been reported to target a narrow audience, suggesting that the opportunity may not be equal across demographics (Dwyer & Hecht, 1992).

Although the findings in the current research found that overall, parents from both DRG B and DRG E expressed the importance of a school-home collaboration when asked to define parental involvement. DRG B Parent Participants primarily described parental practices in the home, and DRG B participant 2 noted that parental involvement in the schools should be less, concerned that schools were becoming too much like a home environment. In DRG E Parent Participants referenced both internal and external involvement highlighting both at home practices and volunteering at their child's school.

Epstein (2005) proposed that parents who are informed and engaged in their children's education can positively impact their child's attitude and academic achievement. Epstein and Salinas (2004) identified a framework, proposing six types of parental involvement: parenting-helping, communicating, volunteering, learning at home, decision making, collaborating with the community. Epstein (2010) referenced external practices that school district leaders should encourage such as volunteer organized parent/guardian groups PTO/PTA, to provide support for the students in school and at school events. Learning at home is also noted by Epstein (2010), describing internal practices district leaders can support as well, such as providing families with the tools to support their children.

In a descriptive case-study, Caño et al. (2016) examined the influence of parent-support using Epstein's framework on different parenting styles and its effect on bridging the gap between parents, students and school routine. The study consisted of ten selected parents, five parents were noted to be high-performing elementary students from a science class and five were parents of low-performing elementary students from a non-science class. The finding showed no significant relationship between parental involvement for high and low performing students with socioeconomic status and parental educational attainment, though parenting type was found to have a slightly significant relationship with higher academic performance. In addition, Caño et al. (2016) proposed that parents and caregivers who are informed and engaged in their children's education will bring positive expectations that will impact their child's attitude and academic performance. Hence, Epstein's (2005) framework has assisted educators nationwide in developing parent engagement programs (Caño et al., 2016).

Parental Involvement Challenges/Obstacles

Overall, the data analysis of the parent participant interview transcript data also found factors such as opportunity, time, availability, the COVID-19 Pandemic, and even other parents to be obstacles. At times it may simply be due to the parent not having the time, which may be due to work shifts, multiple jobs, or just extensive hours.

Resources and support from the school district may be another obstacle, for instance communication may be more challenging under certain circumstances; there are certainly language and cultural barriers, especially in school districts with a high level of diversity it can be challenging to reach all families with the same message or especially the same channel of communication. It is not enough to send messages home through translation. In fact, most schools use a software to translate messages into different languages, however, the real message may be lost in translation.

In a school district with growing diversity, there may be limitations due to several obstacles that could pose a challenge regarding family engagement and parental involvement. The first obstacle might be time. Unfortunately, some parents do not feel they have the time just due to their preference in how their time is spent. This specific obstacle may be the most difficult for schools, for parental attitude may be the foundation of parental involvement (Grusec & Danyliuk, 2014); and if a parents' attitude toward school is negative, it will most likely not change, and if this is the case, the message their child may be getting may not be positive (Dwyer & Hecht, 1992).

Parental Involvement Resources and Support

We found that parental perspective of the resources and support provided by their child's school varied, many expressed concerns. Overall, parent participants emphasized the availability and flexibility of opportunities for parental involvement at school, particularly for working parents. In addition, parent participants shared that once their child moved on from elementary school, they no longer felt as welcome at their child's school after. Lastly, parents expressed that their district's/school's communication about parental involvement opportunities could be improved as well.

School district leaders may benefit from being aware of such concerns, for parents who may have had an unpleasant experience or that perceive that the school district is not providing their child(ren) with an education of value (Dwyer & Hecht, 1992) may develop a negative perception of the school/school district. In addition, parental perception of their school district may be related to how parents communicate their beliefs and/or expectations about their child(ren)'s school/school district (parental education mindset); potential impacting messages parents may convey to their child about the school/school district's ability to provide a meaningful education (Grusec & Danyliuk, 2014; Haimovitz & Dweck, 2016; Mueller et al., 2017; Stanford, 2023). Moreover, Epstein (2005; 2010) proposed that a parent engaged in their child's education may positively impact their child's academic achievement; proposing school districts build partnerships with families and communities. Thus, school districts should work collaboratively with their parents (Yulanti et al., 2020), and community through engagement practices; to create a culture

that places a strong value on education that is shared by all stakeholders.

Community Engagement

We then examined parental perception community engagement, such as the resources and support provided by their community, as well as the perceived assumptions the community may have about the school district. Overall, the findings indicated that each participant expressed that they were satisfied with the resources and support their communities provided to their school district.

To further understand the relationship between community and school achievement, researchers have examined the correlation between the advantages and disadvantages students bring with them to school, such as their neighborhood, social class, and family background. According to Nieuwenhuis and Hooimeijer (2016), neighborhoods may provide a sense of security and consist of like-minded neighbors, therefore contributing to a social and cultural foundation found to have a consistent and strong effect on early student achievement. To further examine the role a community plays, Bickel et al. (2002) investigated neighborhood as its own entity, separate from all other socio-economic factors. The finding supported that even poor neighborhoods can positively impact student achievement if characterized as being a supportive community; reporting that neighborhoods may also provide a sense of security and consist of like-minded neighbors (Bickle et al., 2002). Therefore, the value a community places on education, referred to as the educational climate, can affect the extent to which residents are influenced by their community members (Turner & Rawlings, 2009), impacting a school district.

Conclusion

Schools are often a focus of community involvement, being that an objective of a school district is to shape their students into productive member of society. Van Roekel (2008) proposed that it just may take a village, referencing the ‘collaborating with the community’ element from Epstein’s (2005) parental involvement framework, encouraging the coordination of resources and services for families, students, and the school with community groups; suggesting school districts include businesses, civic organizations, and colleges or universities. The brief supports that when schools, parents, families, and communities work together to support learning, schools have lower absenteeism and higher graduation rates; and students earn better grades and are more likely go on to higher education (Van Roekel, 2008).

Practical Implications

As recommended by Epstein (2010), educational leaders should aim to identify and integrate resources from the community. For, a supportive community is a key factor in student achievement and success. Thus, parents as well as all other members of the community may do well to emphasize not only the responsibility of the school district but

also provide the resources and supports that they may need to be successful. It is also recommended that school districts should establish a framework for measuring and assessing the impact of increased involvement. Administrators and teachers should aim to support the values and practices of all families; developing parent involvement opportunities (Yulanti et al., 2020) that are meaningful and reflective of their district population. The results emphasize that it is also crucial that both school leaders and educators **c**ollaborate with community groups and agencies to address the overall well-being of all stakeholders, such as school-based healthcare and mental healthcare services.

END NOTE: *"The District Reference Groups (DRGs) are a classification system that groups local and regional public-school districts together based on the similar socioeconomic status of their students. Developed by the Connecticut State Department of Education (CSDE), the DRGs have not been officially updated since they were first released in 2006" (School + State Finance, 2023, para 1).*

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Handheld Technology in Kenyan University Classrooms

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Adoption of mobile technologies to facilitate teaching and learning is gaining acceptance in Kenyan institutions of higher learning. This study sought to determine the perceptions of Kenyan University professors regarding the use of handheld devices such as smartphones, tablets and laptops for academic reasons in classrooms. The researchers employed a survey of five Kenyan Universities. A questionnaire was emailed to participants who were Professors teaching at the University level. Descriptive statistics were used to analyze the data collected. The findings of the study showed that Kenyan university professors were proficient with technology and had positive opinions about the use of handheld devices in classrooms. The key themes derived from the data analysis is educational tech training, growth mindset, and modernization of the classroom. Policies should be formulated to address the challenges associated with the said technologies, their acceptance notwithstanding in the classrooms. There is also a need for the Kenyan government to invest in training of educators on use of technology in the classrooms to prepare for the eventual replacement of pencil and paper with handheld devices.

Keywords: Smartphones, Tablets, Handheld Devices, Personal Technology, University Classrooms, Training for Professors.

Introduction

As of 2023, Kenya is a country that is modernizing its infrastructure and access to technology at a rapid pace (Gutola 2022). The consumption and use of handheld devices in Kenya is growing exponentially (Kharono 2022). Handheld devices consist of smartphones, tablets, and laptops. Phones that are not smartphones are not going to be considered as handheld devices in this research paper because they do not have web browsers and utilize apps.

The schools of Kenya generally have not integrated technology into the classrooms (Heinrich 2019, Ochieng 2022), like in the schools of the United States or Western Europe. Primary and secondary school classrooms, especially public schools, do not have sufficient technology for the teachers to teach with or for the students to use for learning (Murigu 2023, Watson 2023). Kenyan primary and secondary schools have limited access to technology because of a lack of funding, inaccessibility of electricity, and inaccessibility to quality technological products (Murigu 2023, Tshukudu 2023).

The universities and colleges of Kenya have greater access to technology than the primary and secondary schools (Bariu 2022). It is a common trend in world educational history for the newest educational technology to be used in the Universities before the primary and secondary schools. In the United States, as the consumption of smartphones grew, universities used handheld devices for educational reasons before primary and secondary schools did. What happened in the universities trickled down into K-12 schools. Currently, many Kenyan public primary and secondary schools ban students from possessing smartphones. Since most Kenyan college students are adults, most universities and colleges do not ban smartphones but instead have policies about when students are limited to using them, like during exams (Bariu 2022).

Throughout previous research, the field of educational technology has evolved over the years. In the following literature review, the older research papers are from 2014-2018. This older literature researched and wrote about school technology in Sub-Saharan Africa as if it was a nuance, and not the norm. The newer research papers of 2019-2023 were written as if it was the norm for Sub-Saharan African university students to have handheld devices, not the primary or secondary students yet.

In this moment in 2024, we, the researchers, believe it is valuable in educational research and policymaking to ask Kenyan college professors questions about their technical proficiencies, their current policies about handheld devices in classrooms, their experience and desire for training to distribute schoolwork through handheld devices, and their ideas for the future of the Kenyan classroom. Therefore, we performed this research. Our research questions were:

1. How comfortable are Kenyan college professors with using handheld devices and allowing them to be used in their classrooms?
2. What policies are there, or should there be in Kenyan collegiate classrooms?
3. What training have the professors received about using technology in the classroom? Do they desire to have training?

The following literature review shows a variety of issues about handheld devices in Sub-Saharan Africa have been researched. We, the researchers, have not seen a previous peer-reviewed journal article asking professors about their proficiencies, beliefs, and training for integrating handheld devices into their lessons. We are intrigued to know the opinions of numerous Kenyan professors. We felt justified to do this research so that there can be some literature about educational technology and its relationship with educators in Kenyan Universities. There are plenty of studies about educational technology in university classrooms, but in different parts of the world. The literature review describes some of these studies. We modeled our own investigation based on what research has been done in the past.

Literature Review

Over the last 10 years, a variety of studies in Sub-Saharan Africa have been done to record data about the use of handheld devices in collegiate classrooms. A majority of the studies found were qualitative studies with some measurable survey data. All the studies question the effect handheld devices have on student performance. Some studies say handheld devices help; some say they do harm.

Prior to the COVID-19 pandemic, research was performed primarily to measure how accessible handheld devices are to the students and other special groups. Masika (2015) found at the time that smart device ownership among medical students is higher than in the general Tanzanian population (88% versus 51%). This was because medical students tend to have greater access to the financial means to buy a smart device and have a greater need for it than a member of the general population.

Jarl (2015) was interested to see what news consumption was like for Kenyan university students through their smartphones. The researchers wanted to see if students with better access were more interested in news and consumed more news. They did group interviews with multiple students and asked them questions about their smartphone use. According to the study, 87% of the respondents showed interest in the news and the biggest factor leading to such interest is the accessibility to technology like phones. Having a smartphone seems to correlate with increased interest in news (Jarl 2015).

Post COVID-19, research about accessibility focused more on the inequality between students. Kukulsa (2023) focused on unequal opportunities among university students within Asia and Africa. In the early 21st century, having or not having a smartphone is an apparent split between the haves and have-nots of society. The COVID pandemic of 2019-2021 accelerated the use and need for handheld devices to be integrated into academic curriculum; it also made more apparent the separation between the haves and have nots. Having equal access to handheld devices in universities would diminish the marginalization of the poor studying in a university (Kulkusa 2023).

Like Kukulsa (2023), other researchers took a positive light about the potential of using handheld devices in the classroom but found major limitations from equitable distribution of the devices to all students. Masika (2015) says the limitations for using handheld devices are cost and sub-optimal internet connection. Kerkhoff (2022) stated the main hindrance of having handheld devices in primary and secondary schools is wireless

infrastructure. In 2019-2021, the Kenyan government handed thousands of 1st grader classrooms tablets to use (Kibet 2017). Many are not being used because they mostly require internet connectivity to use in class. Kukulsa and Kerkhoff both reached these conclusions by interviewing multiple teachers.

Other research was done to introduce handheld device apps to students and professors and record the consequences of the introduction through surveys and performance data. Ruvuta (2016) studied the implementation of self-directed learning activities in Rwandan collegiate classrooms. This means research through web browsers and collaborative learning through chat apps like Whatsapp. The results showed pleasant acceptance of the newly learned apps and a desire to learn more (Ruvuta 2016).

Some places in Sub-Saharan Africa have policies restricting the use of mobile phones in classrooms. Use of mobile phones has been banned in South African secondary schools. Bejraj (2022) wanted to try to implement teaching strategies involving smartphones in secondary classrooms to add some variety to the lessons and see if it helps with classroom engagement. The researchers spent time with six teachers, observing lessons, getting class demographic and performance data. The six teachers were interviewed and asked to write in a reflective journal. There was reluctance among some teachers to use smartphones in teaching and learning. Teachers developed their own strategies to plan and implement the use of smartphones in teaching and learning. The recommendation is there should be training for teachers about the use of phones in the classroom (Bejraj 2022).

Some researchers study the possible psychological harm of using handheld devices within the classroom. Ifeanyi (2018) found that smartphones distract the students from their studies. Ifeanyi (2018) reached this conclusion by surveying and interviewing the students and professors, without obtaining performance data.

Kaniaru (2020) did reach the same conclusion but using performance data. They did a control group experiment where 57% of the students had access to their devices and 43% did not. Based on survey data, students who were denied their phones were more willing to admit their phone usage was impulsive and probably harmful. Nomophobia is the fear of having your phone taken away. Kaniaru (2020) found a majority of the students exhibited nomophobic behavior. According to Kaniaru (2020), Participants in the experimental group, without smartphones, were shown to pay better attention during the class. The researchers did a study where they showed the students a ten minute video about inhalation therapy then gave them all a test about the video. Those without the phones tested better.

The researchers of this article, Jewell and Mogaka, think it would be more valuable information if the test was about something taught over the course of days or weeks. Kaniaru (2020) probably did not have the time or resources to do so. A ten minute video and a test was used to measure short-term memory and attention span. A bigger problem that affects long term grades and test scores is long term use of the phones throughout weeks of being taught.

A main hindrance towards the positive use of handheld devices in the classroom is the lack of training and awareness of educational apps and tools used through handheld devices. Masika (2015) found the students and the professors' lack of "awareness of

available applications or how to access and use them" (Masika, 2015, pg. 5). Kerkhoff (2022) showed that digital literacy is considered a new idea in Kenya.

Masika (2015) believed proficiency with handheld devices in the classroom requires institutional readiness and infrastructural resources that may not always be available in low and middle income countries like Kenya. Without training, people might get confused or give up trying to learn new ways to use their handheld devices for educational purposes. According to Masika (2015), this training should be centered on students. We, the researchers, believe the professors should get priority over the students in training because the professors can implement the educational technology in their classrooms, thus making their students learn and use their handheld devices for the sake of their education. Without training or know-how of using handheld devices in classrooms, professors and teachers do not know how to control classes of students with phones. Without knowledge of the educational uses of handheld devices, students use them solely for entertainment purposes, which can be harmful for one's education.

We the researchers are interested to know what the interest of the professors in training on use of handheld devices is. As for the students, young people tend not to search for academic information and use educational apps, unless instructed to by their teachers. Thus, we want to learn about those who are giving instruction in classrooms. We, the researchers, believe if the professors are literate in educational apps for handheld devices and they use them in class, the students would in effect be receiving training about educational apps in handheld devices.

Research Methodology

Participants

The study employed a survey of five Kenyan public universities offering electronic learning programs to their learners using handheld devices. A questionnaire was the main data collection tool. Random sampling was used to identify respondents across the four universities. The study targeted university lecturers across the five universities. Purposive sampling was used to select the universities. The universities that were selected are: Maseno University, Masinde Muliro University of Science and Technology, Kenyatta University, Kibabii University, and Kaimosi Friends University College. The target population of the professors across the four universities was twenty. We, the researchers, believed twenty to be a big enough sampling pool to reach some consensus; we were also doubtful we could get twenty active participants within those five universities. An electronic questionnaire was mailed to eighty potential respondents. Twenty questionnaires were submitted by the professors. The return rate was 25%.

The Data Collection Instrument

The researchers created a Google form and emailed eighty professors from the five universities. Twenty professors submitted responses. The researchers designed this instrument with the intent of allowing the professors to express their opinions about their access to technology at their respective universities. The questions were designed to be

impartial, reliable, and yet inquisitive. The email was personally sent to each professor. The email is written below.

The hyperlink in the middle of the email led to the Google form. Twelve questions were asked. Seven were multiple-choice questions. Three were questions where the participant would type their answer. One was a checklist question, where the participant could choose multiple answer choices. One was a Likert scale, for the participant to rate their training experience. The following is a table listing the questions we asked, their answer options, and our rationale for asking these specific questions.

Table 1
Survey Questions for the Professors

Questions	**Answer Type and Possible Answers**	**Rationale for Questions**
1. How do you rate your proficiency with using computers?	Multiple Choice: a) Expert b) Advanced Intermediate c) Intermediate d) Low Intermediate e) Beginner f) No Knowledge	Level of proficiency in use of computers
2. Prompt: I am able to read, draft and save a document using a smartphone.	Multiple Choice: a) Strongly disagree b) Disagree c) Agree d) Strongly agree	Level of proficiency in use of smartphones
3. I am able to set up a wireless (Wifi, GPS) feature using a handheld device	Multiple Choice: a) Strongly disagree b) Disagree c) Agree d) Strongly agree	Ability to connect a handheld device to a wireless network
4. I am able to install software such as Microsoft Office on my smartphone.	Multiple Choice: a) Strongly disagree b) Disagree c) Agree d) Strongly agree	Ability to install applications on smartphones
5. I am able to access a learning management system such as Moodle using my smartphone.	Multiple Choice: a) Strongly disagree b) Disagree c) Agree d) Strongly agree	Ability of using smartphones to access learning management systems
	Multiple Choice:	

6. Which device (smartphone, tablet, laptop) has the best usability in classrooms?	a) Smartphone b) Tablet c) Laptop	Most user friendly technological device to use in a classroom
7. Do you think handheld devices should be allowed in classrooms? Why or why not?	Participant types answer	Perception of professors regarding use of handheld devices in classrooms
8. What is your current policy about handheld devices in the classroom?	Participant types answer	Institutional policy on use of handheld devices in a classroom
9. The following are educational tools that require using handheld devices in classrooms. Have you ever heard of them?	Checklist: a) Kahoot b) Quizlet c) Classkick d) Khan Academy e) Nearpod f) Quizizz	Knowledge of educational tools that are supported by handheld devices
10. What is your current age?	Multiple Choice: a) Younger than 30 b) 30-39 c) 40-49 d) 50-59 e) 60-69 f) 70 or older	Type of relationship between age of professors and technology acceptance
11. How much training have you had in using handheld devices as part of the curriculum and instruction?	Likert Scale 1-5 1: None 5: Plenty	User training on use of handheld devices to deliver content to learners
12. Would you like to receive training about using handheld devices as tools for curriculum and instruction? Why or why not?	Participant types answer	Perception of respondents in relation to self-efficacy on use of handheld device

Question 9 lists the following apps and internet-based programs: Kahoot, Quizlet, Classkick, Khan Academy, Nearpod, and Quizizz. These are some of the most used apps and programs in United States classrooms. The researchers have experience using these

programs and find them valuable to know if you are an educator. The following is a list of these programs and descriptions of their utility in classrooms.

Table 2
Tools

Name	What is it?
Kahoot	An online game-based learning platform. As an educator you facilitate learning games, also known as "kahoots", which are user-generated multiple-choice quizzes that can be accessed via a web browser or the Kahoot! app. www.kahoot.com
Quizlet	A study tool based mostly on digital flashcard creation and quiz-style recall of facts. Users can create and then test themselves on study sets they create. They can also browse a database of previously made study sets created by others. www.quizlet.com
Classkick	It lets teachers create and share assignments, monitor students, and give feedback in real time as students work from iPad devices or computers. Teachers assign work digitally through the app and can monitor progress of assignments in real time. www.classkick.com
Khan Academy	It offers practice exercises, instructional videos, and a personalized learning dashboard that gives learners the ability to study at their own pace in and outside of the classroom. https://www.khanacademy.org
Nearpod	With Nearpod, a teacher can create interactive presentations that can contain Quizzes, Polls, Videos, Collaborate Boards, and more. It is a cloud-based student engagement platform. www.nearpod.com
Quizizz	Quizizz is like Kahoot. It is an online-based quiz tool that operates like a gameshow. It also has lesson design tools, quiz making and facilitating tools, and interactive presentation abilities. www.quizizz.com

Source: https://www.educationcorner.com/35-incredible-classroom-apps/

Findings

Data Analysis

When the twenty participants submitted their surveys, the researchers read and collected their data. The researchers chose the above questions because they gave insights into the professors' proficiencies with technology, beliefs about using technology in classrooms, current policies about technology, previous training about technology in classrooms, and desire for training about technology in classrooms. We, the researchers, believe this set of topics would give us a holistic view of Kenyan college professors' relationship with technology in their classrooms. In the following Data Analysis, we show our results and our interpretation of what the results mean.

Current Proficiency. Questions 1-5 were asked for the professors to rate their own proficiencies with hand-held devices. We, the researchers, found this important because greater knowledge about the devices would make training and learning new skills easier than if the professors were ignorant of the capabilities of their smartphones and other devices.

For Question 1, "How do you rate your proficiency with using computers?" 50% of the professors said their proficiency was intermediate. 30% said they were experts. 15% said high intermediate. Only 5% said low intermediate. No one said they lacked proficiency. A strong majority stated they have above-average proficiency with computers.

For Question 2, "I am able to read, draft, and save a document using a smartphone," 40% strongly agree, 30% agree, 5% disagree, and 25% strongly disagree. That is a 70% majority saying they can manipulate documents on their smartphones. For Question 3, "I am able to set up a wireless (Wi-Fi, GPRS) feature using a handheld device," 90% either agree or strongly agree. Only 10% disagree.

For Question 4, "I am able to install software such as Microsoft Office on my smartphone," 85% either agree or strongly agree. Only 15% disagree. For Question 5, "I am able to access a learning management system such as Moodle using my smartphone," 75% either agree or strongly agree. 25% disagree.

In all 5 questions, a majority of the professors state they are proficient in work-related skills on their smartphones. Question 5 had the least positive response with 75% saying that they can access a learning management system. Learning management systems tend to be introduced to educators through training by their schools and education systems. This being the weakest proficiency could mean a lack of technical training in these Kenyan universities.

Beliefs About Technology in the Classroom. Questions 6 and 7 asked for the professors' opinions about the use of handheld devices in the classroom. For question 6, "Which device (smartphone, tablet, laptop) has the best usability in classrooms?", 55% said tablets, 35% said laptops, and only 10% said smartphones. Smartphones are the most accessible of the handheld devices, yet they are the least preferred. Smartphones stereotypically are seen as more of a nuisance than tablets and computers (Haidt 2024).

Question 7, “Do you think handheld devices should be allowed in classrooms? Why or why not?” was a short response question. Out of 20 responses, only 1 professor outright said no, “they are a nuisance.”

The other nineteen respondents said yes but three of them stated there should be limits and caution. They should be used “very rarely. Students should use only them when the instructor finds their utility. They are distracting.” They should be used “not without training or enforced policies.” Handheld devices would help in classrooms “but with training and policies first.”

Sixteen respondents said yes with open arms. Four of them mention replacing paper and pen and changing the delivery of content. “Rarely are handwritten notes needed. I think for example recording lectures would be useful.” Three other respondents wrote how handheld devices are the future and we should embrace them. “The future is in technology.”

Current Policies. Question 8, “What is your current policy about handheld devices in the classroom?,” was a short response question where we received a variety of answers. Five respondents said that handheld devices are “forbidden” in their classes. “If you are caught using your phone while in a class session, you will be asked to leave.” “The university does not allow them to be used in the classrooms”.

Most of the respondents, eleven of them, said yes but with limits. “Students are not allowed to use the gadgets during examination sessions.” “I allow them. I require politeness and rules such as not taking or making calls in class.” “You can use them during class time, when I am not lecturing and when there is not an exam.”
Four respondents either said there are no policies, or they have no idea if there are policies about handheld devices in their universities. “None.” “None at all.” “I have no idea about any policy of this nature.”

Knowledge of Some Handheld Device Educational Programs. Question 9 was “The following are educational tools that require using handheld devices in classrooms. Have you ever heard of them?” The following apps were listed: Kahoot, Quizlet, Classkick, Khan Academy, Nearpod, and Quizizz. In the United States, these are some of the most popular educational programs meant for use in classrooms during lessons. Descriptions of them are in the data collection section. 35% of the Kenyan professors have heard of Kahoot. 35% of the Kenyan professors have heard of Khan Academy. 20% have heard of Quizizz. 15% have heard of Quizlet. None of the Kenyan professors had any knowledge about Nearpod or Classkick.

Age. Question 10 asked for the professors to state what age group they are in. None of the professors were younger than 30. Ten percent were between 30 and 39 years old. Fifty percent were between 40 and 49 years old. Thirty percent were between 50 and 59 years old. Ten percent were between 60 and 69 years old. None of the professors were 70 or older.

Training. Question 11 was a Likert scale question asking the professors to state how much training they have received for using handheld devices in the classroom. The number 1 meant zero training and the number 5 meant plenty of training. Seventy percent of the professors picked the number 1, meaning they have received no training at all. Ten percent chose the number 2, meaning they have received very little training. Five percent chose the number 3, ten percent chose the number 4 and five percent chose the number 5.

Question 12 was: "Would you like to receive training about using handheld devices as tools for curriculum and instruction? Why or why not?" Of the 20 respondents, nineteen of them responded positively with the desire for training. Only one said no with "Not at the moment. I have sufficient knowledge for my current needs."

The rest of the professors said yes with valuable reasons why. "I want to be equipped with knowledge and skills to instruct my learners adequately." "Training about tech would help me connect with the students." "I should have more knowledge about how to use them in classrooms." "Training is always appreciated even if one doesn't think they need it."

Recommendations

Primary and secondary schools should consider adopting handheld devices in classrooms. Students will most likely have handheld devices to use and it would be beneficial for the students to learn how to perform academic skills with these devices. The schools should also have their own hand-held devices that can be used by students who do not have their own.

Institutions of learning should formulate policies that can promote use of emerging technologies at all levels of learning. Writing policies is not enough; there needs to be implementation of the policies. That requires investment.

The Kenyan government and educational institutions should invest in professional development training for its university professors to learn how to utilize handheld devices as educational tools for enhancing student performances in their classes. If the Kenyan government and Kenyan universities want to nurture a Kenyan workforce that is prepared to compete in the world economy, its professors and its students should learn to use hand-held technology to benefit their own skill sets, academic performance, and job readiness.

Discussions and Conclusion

The findings of the study show that university professors are proficient in the use of handheld devices in terms of usability in relation to manipulation of documents, setting up wireless hotspots, installation of applications, and accessing learning management systems using devices such as smartphones. In terms of beliefs about the most suitable technology in the classroom, the majority of the respondents preferred tablets followed by laptops. Numerous participants asserted their belief that smartphones should be avoided in class because of their stereotypical entertainment and outside communication use. "They are a distraction."

However, some participants saw the value of smartphones in class. “Some students only have a smartphone, and not a laptop because they can only afford one or the other.” Handheld devices, especially smartphones, can be used with caution. We, researchers, believe the data shows training is necessary for professors to feel like they can implement smartphones as an educational tool. The training should show educators, such as these professors in Kenya, some of the best educational apps and tools that can be used using smartphones and demonstrate how they can be used in a class setting with many students.

Regarding the policy on the use of handheld devices, the majority of the respondents indicated that phones are allowed in classrooms but with caution. The findings imply that handheld devices are gaining acceptance in learning institutions, challenges on their use notwithstanding. The professors know that handheld devices are going to be the future tools for note-taking, assignment completion, inter-classroom discussion, and examination. The professors have received little to no training about how to prepare for this exponentially quick transition toward handheld devices replacing pencil and paper. The Kenyan government and education sector should invest in training its educators about how to utilize handheld devices to improve student performance in the classroom.

The data from the survey shows there is a need and a desire for Kenyan college professors to receive training about how to integrate handheld devices into their lessons. A professor’s response to the question about the desire for training said, “Training about devices would help me teach in future school years.” The age question showed a majority of the professors are in their 40s or 50s. That means they have 10-25 years before they retire. They will be in the classroom for decades into the future. In this upcoming future, pencil and paper will be phased out of the curriculum and handheld devices will replace them. Kenyan professors need training about how to integrate these devices into their lessons so that they can maintain and improve student proficiency in their topics of study. When professors and teachers implement new tools in the classroom, their students learn how to use the tools too.

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Data collecting instrument: https://forms.gle/JjV8wfdMMduJZikn9

Teacher Perception of Blended Learning on Student Engagement in the Post-Pandemic Era

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The world of education faced an unprecedented challenge when the pandemic forced schools to close and transform into remote education through digital platforms. When the schools started to reopen for face-to-face instruction post-Covid, instead of returning to the familiarity of traditional classrooms, the educators realized that the education landscape had changed. Digital platforms continued to play an integral part and students displayed disengagement from school. A public high school in southeast Texas implemented blended learning to increase student engagement. This case study investigated the perceptions of teachers on using blended learning to increase student engagement in the post-pandemic era in a K-12 setting.

Introduction

The term *new-normal* was first introduced in the business world and later adopted in other sectors, meaning something atypical earlier has now become the norm (Cahapay, 2020). In the context of K-12 education, the "new normal" is a flexible structure of classroom instruction and the permanency of digital education even after classes have now returned to in-person after the pandemic. Striking a balance between digital and traditional modes of instruction to keep students engaged has become the new challenge in post-COVID classrooms (Suriagiri et al., 2022).

This study sought to explore the experiences of teachers as they blended various modes of learning with an emphasis on relationship building during small group in-person instruction. Kohnke and Zou (2021) highlighted the importance of digital tools, independent study, and flexible and collaborative learning as important pedagogical techniques to improve students' learning experiences. Lane et al. (2021) reported a significant increase in Blended Learning (BL) implementation in post-secondary education as it emerged as a favorable mode of learning among higher-education students. Moreover, Short et al. (2021) indicated a rise in the popularity of this method in the K-12 context and Diziuban et al. (2021) also emphasized the increasing interest in BL and its impact on teaching and learning environments.

A remarkable attribute of the BL setting was allowing autonomy to students in learning, which improved communication between the students and their instructor and built trust and confidence (Suriagiri et al., 2022). Students with digital competence thrived in online environments and the sense of autonomy positively affected success in face-to-face environments (Suriagiri et al., 2022). While students having the opportunity to choose from various learning options is important in transferring ownership of learning to the learner, the role of the teacher in guiding students into making those choices is necessary (Bergdahl & Bond, 2022).

While the merits of student-led style of learning are well documented in higher education settings, there is limited information available in the K-12 area on the impact of BL in improving student engagement, the role of teachers and student readiness (Suriagiri et al., 2022). This research gathered perceptions from the participants on the efficacy of blending differentiated instruction, small group discussions, and collaborative learning to increase student engagement at a public high school in Southeast Texas.

Theoretical Foundation

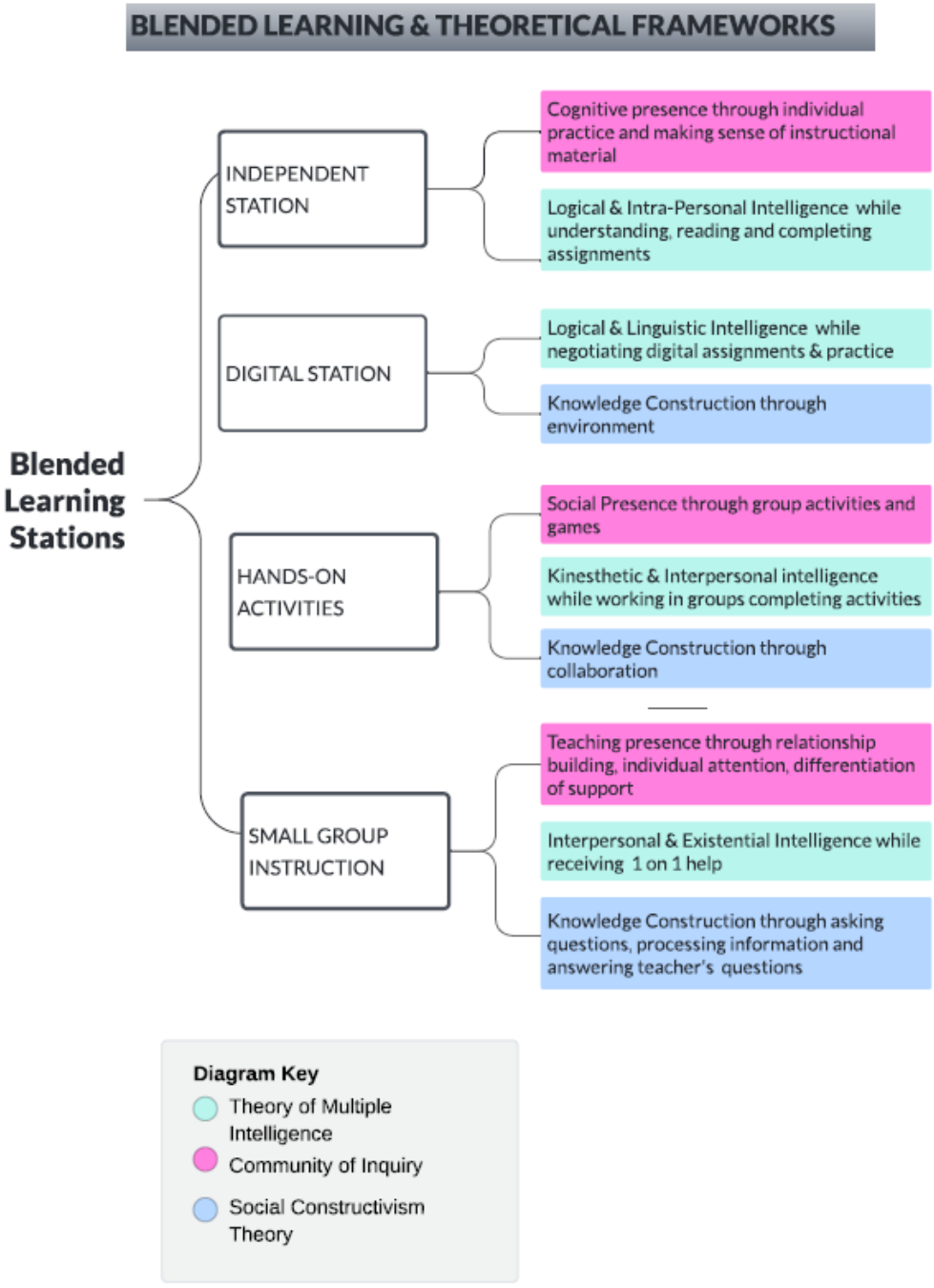
This research is grounded in a relationship between social constructivism theory, multiple intelligences, and the community of inquiry model and how they influence BL models. Social constructivism theory supports the pursuit of problem-solving by interacting with peers, instructors, and curriculum. According to Vygotsky (1962), the experience of reflecting with peers while problem-solving and learning is the essence of social constructivism. Planning different stations of BL and visualizing how students will rotate through the stations requires careful forethought. These are internal factors of the classroom that contribute to student engagement in constructing knowledge, according to

Siddiqi et al. (2022). Social Constructivist Theory is an appropriate framework because, through group activities, discussions, and explorations, learning can be transformed from a passive, disengaged activity to an active learning process.

In addition, Gardner's Theory of Multiple Intelligences suggests offering various learning modes to cater to diverse learners' strengths. Gardner's theory provides a

Figure 1

Inter-Relationship of Theoretical Frameworks in Blended Learning Environment



framework for developing instructional design, which includes a variety of techniques, delivery, and media. The third framework supporting BL is the Community of Inquiry model of learning proposed by Garrison et al. (2000). It considers cognitive, social, and teaching components in a BL environment. The interplay of various aspects of learning theories in a BL environment is illustrated in Figure 1.

BL in Education

BL has received much attention in the past decade due to its promising nature of transforming education from teacher-led to student-led learning (Truitt & Ku, 2018; Zainol et al., 2018). Post-COVID conversations about how to facilitate 21st-century education present opportunities to envision what a post-pandemic K-12 classroom would look like that engages all learners (Tarc, 2020); as well as get an understanding of how teachers will be included and supported to transform education (Hill et al., 2020; Netranzi, 2020; Tarc, 2020; Zhao & Watterston, 2021). Since student engagement is an indicator of student learning and achievement, it is important to explore if BL can mitigate the challenges of post-COVID classrooms and improve student achievement in high school settings (Halverson & Graham, 2019; Kurt et al., 2022; Lane et al. 2021; Tas, 2016).

BL is referred to as the new-normal of the educational landscape post-COVID and reported as becoming increasingly popular in the K-12 area (Graham, 2019). Research showed BL brought positive learning outcomes in post-pandemic classrooms by increasing student engagement (Heilporn et al., 2021; Lane et al., 2021; Sahni, 2019; Suriagiri et al., 2022). Graham (2019) noted most teachers have limited experience in combining multiple modalities of instruction and therefore, professional development for the teachers is critical to support successful implementation of BL. Short et al. (2021) underscored the need for strong leadership to support BL implementation and additional planning time for the teachers to prepare for blended instruction besides periodical professional development. Chen (2016) added that in addition to relevant training and professional development, skillful implementation of BL requires accountability from all stakeholders- teachers, administrators, students, and parents. Singh et al. (2021) found: a clear need for conducting studies to demonstrate effectiveness of blended and hybrid instruction and how instructors can work on designing their classes making it a viable option during current times and as we prepare to teach in the post-vaccine and post-pandemic world. (p.143)

Extensive work has been done in higher education and on student perspectives about blended classrooms. However, the impact of BL on increasing student engagement in K-12 setting and the perspectives of teachers implementing BL with school-age children are scarce (Heilporn et al., 2021; Sahni, 2019; Singh et al., 2021). Student Engagement is a solution to re-ignite passion for learning after the pandemic, reduce dropouts, improve self-esteem, and encourage critical thinking (Kurt et al., 2021; Waldrop et al., 2019). While it is not the objective of this paper to study the nuances of SE, it is important to describe various dimensions of SE available in the literature to understand how blended teaching impacts different aspects of SE. Following are the four dimensions of SE, as described in the literature:

Behavioral Engagement

Indicators of behavioral engagement include participating in activities, intentionally putting effort to overcome challenges, participating in school-based activities, and asking relevant questions (Lei et al., 2018; Waldrop et al., 2019). Li and Xue (2023) identified behavior as an external factor affecting student engagement determined by social, family, and school environment.

Emotional Engagement

Students feel emotionally engaged when they feel positive about their learning environment, including teachers, students, and school (Waldrop et al., 2019). If a teacher fails to establish a supportive environment by adopting harsh corrective measures, it hurts emotional engagement, leading to emotional anxiety for the learner (Li & Xue, 2023). An enthusiastic and fair instructor who understands student needs and supports student autonomy is instrumental in helping students be emotionally engaged (Pedler & Hudson, 2020).

Cognitive Engagement

When a student displays ownership toward learning and mastering skills, it is called cognitive engagement (Sinatra et al., 2015; Tas, 2016). Instructional practices and resources employed by the teacher in the learning process play an important role in stimulating cognitive engagement in the students (Pedler & Hudson, 2020). Lei et al. concluded that going deeper into the content matter was an attribute found in highly motivated students, aiming to improve understanding, versus a less motivated student, whose goal was to pass the content.

Agentic Engagement

Agentic engagement is when students actively participate in their learning by asking questions or suggesting alternatives, which can significantly impact the course of instruction (Sinatra et al., 2015; Tas, 2016). Being an agent of one's learning requires motivation (agency) and action (agentic engagement) (Reeve & Shin, 2020). Agentic engagement is the reciprocity expressed by the student to the learning environment.

Rethinking Post-COVID Classrooms in BL Context

Re-engaging students who returned from remote education and who had experienced childhood trauma due to death, poverty, isolation, etc., was one of the biggest challenges facing educators (Parker & Hodgson, 2020). To address the challenge of re-engaging students in post-COVID classrooms, there has been a huge emphasis on student autonomy in the learning process (Oranga & Matere, 2022; Suriagiri et al., 2022). Darlene-

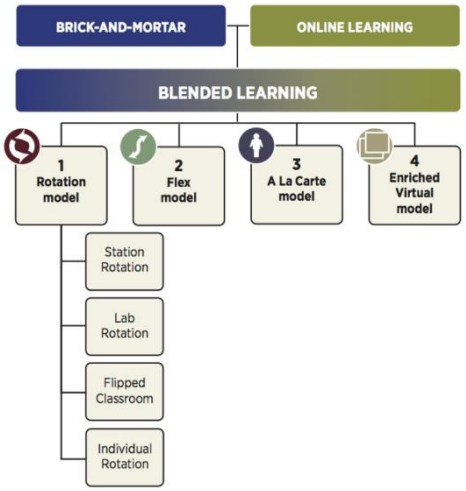
Hammond et al. (2020) stressed the need to utilize in-person and synchronous time for teaching new skills, inquiries, and introducing varied learning resources so that students can indulge in self-directed learning during asynchronous learning periods. Lane et al. (2021) attributed post-secondary students' increased motivation and on-task behavior to blended teaching methods. The researchers observed instead of providing quick answers to student questions, allowing them to reflect and provide feedback to each other to help refine responses would transfer ownership of learning to the learners.

Yet another aspect of rethinking teaching style is the importance of allowing movement in the class. Rands and Gansemer-Topf (2017) studied the effect of creating active learning spaces in the classroom to improve SE by rearranging furniture, learning tools, and allowing movement. The Clayton Christensen Institute (2012) popularized the concept of student control over “time, place, path and/or pace” in the online component of blended instruction (Staker & Horn, 2012, p. 34). However, the flexibility of the pathway to learning could be detrimental to learners who rely on instructive teaching and cannot make decisions for themselves (King, 2023). Students with digital competence thrived in online environments and the sense of autonomy positively affected success in face-to-face environments (Suriagiri et al., 2022). While students having the opportunity to choose from various learning options is important in transferring ownership of learning to the learner, the role of the teacher in guiding students into making those choices is necessary (Bergdahl & Bond, 2022)

Models of BL

BL describes a blend of brick-and-mortar, face-to-face instruction with computer-based, online education (Graham, 2006; Singh et al., 2021). No matter which specific

Figure 2
Common Models of BL



Note: Source: Clayton Christensen Institute (2012).

model of BL or a blend of online and in-person delivery is adopted, the most important aspect of meaningful learning for the students is the pedagogy itself (Graham, 2019). Staker and Horn (2012) and The Clayton Christensen Institute (2012) laid out four BL models: rotation, flex, a la carte, and enriched models (Figure 2).

Rotation Model

Staker and Horn (2012) described different forms of rotations that use a variety of learning modalities to teach a concept. Students move cyclically, completing tasks that involve various modalities, one of which is small-group instruction with the teacher (Truitt & Ku, 2018). In the station rotation method adopted in this study, the teacher set up predetermined learning stations, and students were intentionally grouped. At least one of the stations is digital, another is teacher-led, and there are other manipulatives, exercises, etc., at the other stations. Besides the promises that the station rotation model will help student engagement, there are a few perceived threats to this model. Technical incompatibility between the teacher and/or the students and lack of integrity, especially as students are not being monitored at every station, can prevent drawing the maximum benefit, as noted in the SWOT analysis by Singh et al. (2021).

Methodology

The researcher conducted a case study to focus on the blended learning program at the research site and understand its impact on student engagement in the post-pandemic era. A case study is an in-depth exploration of a bounded system (blended learning methodology in this case) based on extensive data collection (Creswell & Poth, 2016). An intrinsic case study was an appropriate research design because the researcher wanted to highlight teachers' experiences with blended learning implementation with high school children and the challenges (Creswell & Guetterman, 2019). The researcher aimed to provide "rich, contextual details about the strengths and weaknesses" of this teaching methodology in the post-pandemic times through semi-structured interviews with the teachers who implemented blended learning at the research site (p. 478). A case study involves extensive data collection by drawing information from multiple sources (Creswell & Poth, 2016). For that reason, the researcher drew information from the interviews and used the TAPR data as a reference to explain the themes that emerged from the teachers' responses. Understanding teachers' perspective of improving student engagement in a blended environment, the amount of preparation it required, the available support structure and the quality of professional development provided, together with the TAPR data painted a wholesome picture of the impact of BL at the high school. . Interviewees for the study were selected by purposive sampling. All participants had implemented BL with the freshmen for at least one full school year.

Research Design

The purpose of this qualitative study was to understand teacher perceptions on

using BL to increase student engagement post-pandemic at a public high school in southeast Texas. The following research questions guided this study:

1. What are teachers' perceptions of the challenges in engaging students post-pandemic at a public high school in southeast Texas?
2. What are teachers' perceptions of the impact of BL in increasing student engagement post-pandemic at a public high school in southeast Texas?
3. What are teachers' perceptions of their efficacy of teaching using BL methodology post-pandemic at a public high school in southeast Texas?

Texas Academic Performance Report (TAPR) Data and Performance Bands

In the state of Texas, students must pass five end-of-course (EOC) exams in high school to graduate. Performance on the EOC exam has four levels: Does Not Meet (Fail), Approaches, Meets, and Master grade level. Texas Education Agency (TEA) establishes cut scores that define performance levels for an assessment called standard setting. Number of questions one needs to answer correctly in different performance levels is called the 'Raw Score' (TEA, 2023). Cut scores for different performance bands in subject areas for the past two years for ninth-grade students are listed in Table 2.

Table 2

Performance Bands EOC 2021-22 and EOC 2022-23

	English 1		Algebra 1		Biology	
Year	**2021-22**	**2022-23**	**2021-22**	**2022-23**	**2021-22**	**2022-23**
Approaches	38	27	20	20	18	14
Meets	44	36	34	32	30	25
Masters	58	54	41	41	41	38

Data Collection Procedures

Participants of this study were certified classroom teachers in the state of Texas and implemented BL in the freshmen grade level at a public high school in southeast Texas during the year 2022-23. Responses to the interview questions were coded to look for themes. Repetitive occurrences of "routines, rituals, rules, roles and relationships" helped determine patterns of a BL classroom (Saldaña, 2021, p. 8). Summarization of participants' responses along with verbatim quotes were used to answer the research questions. Additionally, a comparative chart of student achievement between 2021-22 and 2022-23 presented differences in student success experienced by different demographics from year to year. Demographics of the participants is presented in table 3.

Table 3

Participant	Gender	Total # of years teaching	# of years teaching in BL format	Subjects Taught
P-1	M	5	1	Biology, Physics, Chemistry
P-2	F	10	2+	Biology, AP Biology, Physics
P-3	F	4	2	Biology, Chemistry, Environmental Systems
P-4	F	10	3	English, Career & Technology
P-5	F	35	4	Algebra, Geometry
P-6	F	4	4	English 1

Limitations

Limitations are those factors that may affect the study and over which the researcher cannot exercise control (Creswell & Guetterman, 2019). The researcher selected one high school in a single school district where BL was being implemented. This limited the research findings to one location and largely within one grade level, the ninth grade. Moreover, the perception of all teachers who implemented BL is not included in the study as they were unavailable for an interview. Therefore, more generalizability of the results is needed.

Findings

The campus improvement plan of the research site targeted not just increasing the passing percent but to also increase the percent of students achieving 'masters' performance. Meeting standards in the EOC exams is a requirement of high school graduation and is also an important factor in the campus performance report card (TEA, 2023). Therefore, the TAPR data was referenced to see if the success experienced by the students in various demographics was different between the two years of interest.

Research Question One

What are teachers' perceptions of the challenges in engaging students post-pandemic at a public high school in southeast Texas? The researcher found three themes in this research question: *regression in understanding school norms, lagging social skills and lack of confidence,* and *complacency*. Table 4 presents some direct quotes relevant to these themes, and discussion of the themes follows.

Table 4
Themes in Responses to RQ1

Theme	Response
Regression in understanding school norms	P4: It's kind of like you had to relearn to walk after a mini-stroke, they were relearning how to talk or do anything. P5: They would work only if the teacher was right next to them. P2: Allowing students to turn in work right up to the very last minute snowballed into habitual late work.
Lagging social skills and lack of confidence	P1: They just seemed out of it, like they had just woken up; students had fallen behind in social development. P3: Students needed to get their confidence back, think on their feet, speak for themselves. They relied on technology so much that it was a distraction. P4: It was a slow process of getting them to communicate; never had kids so quiet in a bad way; was 1 to 1 technology necessary after coming back fully in person? Couldn't we go back to having just class-sets?
Complacency	P2: There was no urgency due to the limitless grace towards turning the assignments. Everybody needed a little kickstart to become interactive again. P1: Only if you approached them, then you had some way of getting them to be involved with you, or else they would just goof around.

Regression in Understanding School Norms

The researcher found that on returning to the in-person school, students had forgotten what it was like to be in school environment and abide by the expectations along with the importance of punctuality. Virtual schooling did not require students to be present in class on time and they could complete assignments right up to the very end of the grading cycle.. Merely showing up to class on time and staying in classroom for the entire class period seemed to be a struggle for the students. They had to be re-trained on the

importance of the punctuality and the consequences of missing deadlines.

Lagging Social Skills and Lack of Confidence

The researcher found that engaging students in classrooms in the years following the pandemic was an uphill task. Students returned with severe deficiencies in social skills such as communication, participation, and engagement with learning. Students were hesitant to take ownership of their learning and were ready to give up at the first instance.

Complacency

Students found it challenging, after the pandemic, to complete assignments in a timely manner by pacing themselves. Typically, an exam that was scheduled to be completed in one to two hours transformed into a twelve-hour, open-book assignment during virtual schooling (Bashir et al, 2021).

Research Question Two

What are teachers' perceptions of the impact of BL in increasing student engagement post pandemic at a public high school in southeast Texas? The researcher found four themes in this research question: *growth occurs over time; intentional grouping and activities; relationship building;* and *teacher buy-in and student accountability*. Table 5 presents some direct quotes relevant to these themes, and discussion of the themes follows.

Table 5

Themes in Responses to RQ2

Theme	Response
Growth occurs over time	P3: There was a learning curve, they grew a lot, started to problem solve, push themselves, take responsibility for their own education. P5: Students may not want to move in the beginning, so give them small bites, get them used to it, students need to feel yes, I can do this.
Intentional grouping and activities	P5: Gamification of learning like using Desmos, motivates students to not give up; They keep playing as if it was a video game even when they are unsuccessful, it doesn't faze them, they just wanna win. P6: Choice works for advanced learners but for the others, teachers provide specific direction "you do this and this today.

Relationship building	P3: Mini-lessons in small groups were my favorite; a pat on the back, weird conversations, there was human connection. P1: Downfall of the mini-lesson is that you're responding more to those who are more vocal so it's not uniform. P5: My teacher's right here, I can really just reach out and touch him.
Teacher buy-in and student accountability	P3: There needs to be teacher buy-in if you want to see the students grow. The more buy-in I had, the more my students persisted. P3: If [students] don't see their own growth, they're not gonna put in the effort. P2: What [students] get out of today is how much effort [they] put in today.

Growth Occurs Over Time

The researcher documented teachers' responses indicating improvement in student engagement as time went by. Since students were so used to teacher-directed learning, they required some time to process how to make learning related decisions on their own. Once it became a routine, students rose to the expectation. Just like students, teachers also got more adept in planning meaningful learning experiences and gauge potential disruptions as they did it more often.

Intentional Grouping and Activities

The researcher found there were more chances of students being engaged at least during part of the lesson cycle because a variety of learning modes were offered during a blended lesson. Higher achieving students who did not need further instruction were sent to the station where the teacher created opportunities for critical thinking, creating, communicating, collaborating, and showing citizenship to extend their learning. Independent learners had online resources to learn and practice by self-direction. Many of those online resources offered accessibility, which was helpful for emergent bilingual students. Students who were ahead in their learning took the ownership of leading their classmates to finish their work. It was an opportunity to grow leadership qualities in students and deepen their understanding of the concepts.

Relationship Building

The researcher found that mini-lessons in small groups were the most favorite aspect of the blended classroom amongst the teachers in increasing student engagement. Students were not embarrassed to be vulnerable in a small setting near the teacher. Some teachers played games with a small bunch of students as they showed their mastery; others made students draw or write with chalks and markers on dry-erase boards, desks, or index cards; a few other times, students would do test corrections and learn test-taking skills as they sat in small groups with the teacher at a table. Teachers often used stamps, stickers, prizes, or treats to give away at the mini-lesson station to reward student participation.

Teacher Buy-In and Student Accountability

Students mimic the adults in the classroom, and if the teacher is averse to BL and appears to be doing it merely for compliance, this methodology will fail to achieve its goals. From an observer's view, the classrooms appeared chaotic and often loud. There was always a plan beneath the obvious. Visible movement of learning in the form of checklists and progression boards was important for the teacher to gauge student learning and to make student accomplishment visible and use it as an encouragement. However, the amount of success a student would experience from carefully planned learning activities was ultimately tied to the student's desire to learn. This is not necessarily an attribute of a blended lesson but learning in general.

Research Question Three

What are teachers' perceptions of their efficacy of teaching using BL methodology post-pandemic at a public high school in southeast Texas? The researcher found four themes in this question: *beginning apprehension, continuous modeling, training, and feedback; lack of confidence; understand the 'why'*. Table 6 presents some direct quotes relevant to these themes, and discussion of the themes follows.

Table 6

Themes in Responses to RQ3

Theme	Response
Beginning Apprehension	P6: It was my first-year teaching and I was learning how to teach in hybrid environment and incorporate BL; I didn't know what I was doing. P2: The hardest part in the beginning was students lacking motivation; Later as I got better, my students did better. Feel bad for our first-time teachers having to implement blended who were so new to the teaching environment.

Continuous Modeling, Training, and Feedback	P6: Procedures are the most important factor behind a successful blended lesson. So may be help a teacher with those basics first? P1: Need handholding in designing stations in the beginning; experiential PD and social learning with colleagues was helpful. P3: Two days of training in the beginning, so many resources were presented, it was a BL throw-up.
Lack of confidence	P2: If we failed, it wouldn't be detrimental [*about using blended days for reviews*]; it was a safe way of doing it with a team of new teachers. P4: Certainly not the first day of a new content.
Understand the 'Why'	P5: Why does blended stop after 9th grade? It's the only time they are applying skills of a 21st-century learner, it should be made mandatory for the upper-level students. P6: It didn't really bring people on-board, it was all about how to do it versus *why* should you do it, it took time to understand the purpose and goal behind blended. P3: Remember these are teenagers, they're gonna be goofy, lazy, don't expect them to learn without guidance from the teacher; start off with lot of hand holding then they slowly become self-reliant like babies. I wasn't sure then. but most of my kids got meets and masters in their EOC and it was my first year teaching Biology.

Beginning Apprehension

The basic requirements of a successful implementation of BL are great classroom control, knowing what works for the diverse learners, experience in pivoting, etc., that come naturally with experience. Participants felt that the new teachers were at a

disadvantage in these areas. Although teachers were apprehensive about the benefits of the methodology and were unaware of the reason behind the implementation, as time went by, after a few training sessions and implementations, there was an increased buy-in from the teachers.

Continuous Modeling, Training, and Feedback

The sheer volume of resources shared with staff at the beginning of the school year was beneficial in creating a BL toolbox and overwhelming. Teachers felt that spreading the training over the school year into smaller segments would have been far less overwhelming and easier to adopt. Teachers supported being observed and receiving feedback, however, they emphasized that modeling strategies with the students could be more beneficial than merely providing feedback. Opportunities to observe team members implementing BL and breaking a large team into smaller groups could also have benefitted the teachers.

Lack of Confidence

The researcher sensed teachers' lack of readiness to teach using a blended format from the content chosen for blended days. Every participant said they did not teach a new concept using blended methodology but used it only for review purposes. They feared students not comprehending new information if they were studying it on their own at the learning stations and might lead to disengagement. Most teachers did not take a grade on those days, and few used informal grading to assess completion. Not taking grades was meant to offset the risk of students making zeroes for non-completion of self-guided assignments.

Understand the 'Why'

The researcher felt that the teachers asked to implement BL needed to know why the initiative was taken. For someone who has no classroom experience or has always taught using traditional lecture and worksheet methods, letting students rotate within the classroom and being unable to monitor students constantly can be unnerving. The researcher also noticed the apprehension amongst the teachers on the amount of time it took to plan the learning stations and the outcome it produced. Some teachers questioned why BL was not sustained beyond ninth grade. Two participants mentioned they would like to see BL continue beyond ninth grade because as students grow older, they can guide their learning better. Unless it is how students learn all four years of high school, they are not being prepared to be the 21st-century learners that is often discussed.

Milestones of BL

When asked to recall positive experiences with student performance in the EOC exam, one participant mentioned being pleasantly surprised at some specific students' scores because they did not show much promise in day-to-day assignments. Teachers utilized 1:1 devices to the fullest extent on blended days by providing short, recorded

lectures and self-scoring assignments to allow practicing skills, generate quick data to make data-based groupings and gamify assignments. However, nearly all the interviewees underscored the importance of paper-based assignments, hands-on activities, creating models, expressing thoughts by writing on index cards, and communicating verbally with classmates to be important in learning apart from computer-based learning on blended days. Although the campus did not meet its yearly performance goal in 2022-23, it should not solely be attributed to BL methodology because this model of teaching and learning is primarily people-based. There were mixed results seen in the EOC exam, which are represented in the following charts:

Figure 3 *English I: Approaches and Masters*

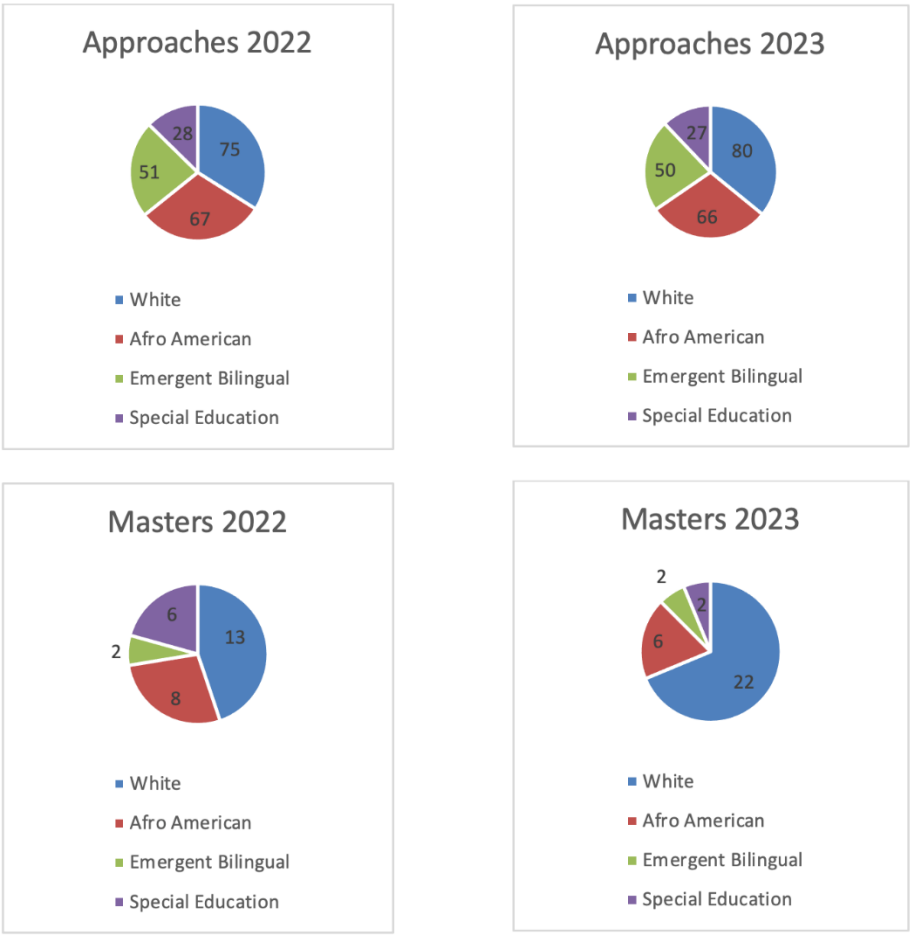


Figure 4 *Algebra I: Approaches and Masters*

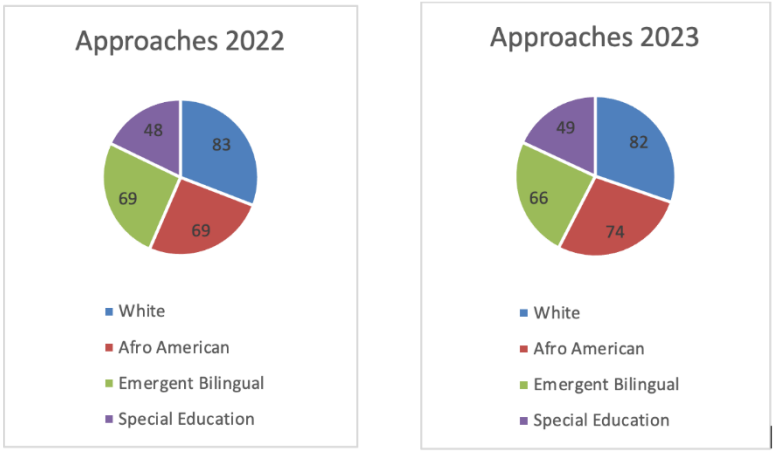


Figure 4 *Algebra I: Approaches and Masters continued*

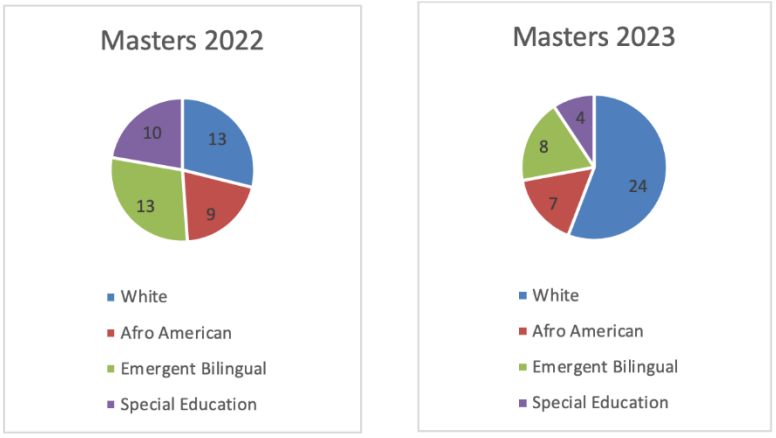
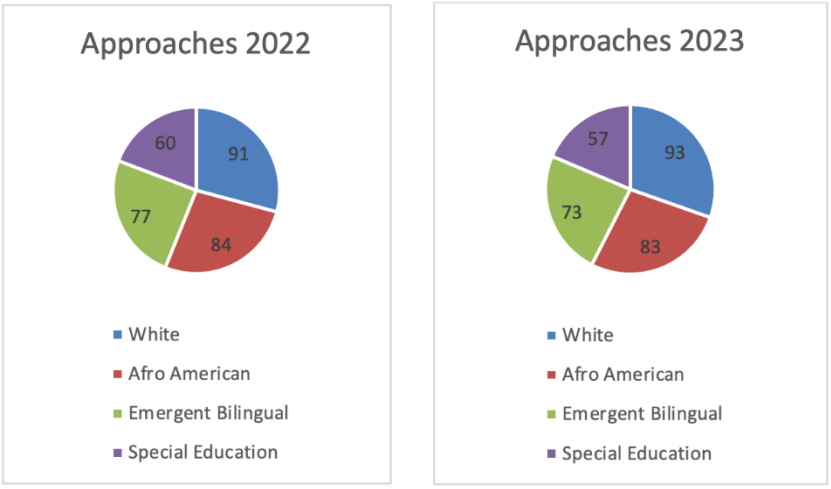


Figure 5 *Biology: Approaches and Masters*







Discussion

No formula for successful implementation can be applied to every situation. The possibility for the teachers to implement BL with little variations depending on the group of students they serve can produce desirable outcomes instead of working in a rigid structure. Artificial intelligence and advanced technology have diminished the importance of traditional skills such as repetition, memorization, and recall, and 21st-century skills such as critical thinking, collaboration, and creativity have become more desirable (Zhao & Watterston, 2021).

On behavioral engagement during the blended day, teachers unanimously agreed on the importance of providing clear guidelines for completing assignments and establishing clear classroom expectations before teaching in a blended environment. The thoughtful grouping of students to eradicate the possibility of mischief was one of the considerations when planning blended days. Teachers put a lot of effort into arranging the furniture to avoid crowding during rotations, thereby preempting unnecessary confrontations among the students.

On emotional engagement during a blended day, the opportunity to meet in small groups with a handful of students was the highlight of a blended day for all participants. There were moments of intimate sharing where the affective filter was lifted, there was laughter and excitement, and there were opportunities for closing the gaps in learning. Participants reiterated the importance of teacher involvement in BL implementation.
On cognitive engagement, teachers expressed that thoughtful grouping of students played an important role in supporting students' cognitive engagement. Placing learners of mixed abilities can impede master learners' desire to take learning to the next level, and conversely, it can make growing learners conscious of their lack of knowledge.

On agentic engagement during a blended day, one of the key adjustment teachers had to make in their teaching approach was to relinquish control and allow students to learn independently in a manner that appealed to them. Students found the opportunities in a BL environment to assert themselves, questioned and debated, as the teacher took on the role of a facilitator rather than an instructor.

Implications

While the researchers stressed that emotional engagement has the greatest impact on student engagement, the participants opined behavioral engagement is a significant factor with school-age children. Teachers expressed that the deeper involvement of the administration in curbing behavioral infractions might bring some reprieve and improve efficiency. Given every school campus's constraint in staffing, one must get creative in setting aside more time for planning purposes. Clear communication about the goals and processes, support structures, and expectations must be relayed to all parties to emphasize the importance of the blended learning initiative.

Recommendations & Future Research

Teachers will have a learning curve and must feel supported wherever they are on their continuum of growth. As stressed by Singh et al. (2021), there needs to be a supportive environment and all stakeholders to assume responsibility. Preparation and execution can be exhausting, and a new teacher might give up trying if their struggle is not understood. Although autonomous learning enhances student engagement in higher education students, school children require training to be independent learners (Sahni, 2018). Incidents of disengagement stemmed from activities that were not age-appropriate and were either too elementary or too complex. According to Lane et al. (2021), the instructor must help students see the relevance of the activities with the day's learning objectives. Providing 'I can' statements can help students have tangible goals and feel accomplished at the end of class. Some teachers suggested the presence of two adults in the classroom could help run a blended lesson more efficiently. Perhaps teachers within a team can merge their classes if the numbers are manageable.

Some participants expressed their preference towards designing a blended lesson independently, without having to restrict themselves within the team expectations. A case study to determine whether being a part of a small learning community is a helpful factor in developing a master instructor of BL or a constraint could be a research topic for the future. Since certain demographics of students responded positively to BL, research on BL will benefit from studies focusing on which groups of students respond positively to learning autonomy. A quantitative study using Pearson's correlation can be conducted to determine if there is a linear relationship between BL and student achievement.

Conclusion

Singh et al. (2021) asserted the need for more studies to determine the effectiveness of BL in the post-pandemic era. This study contributed to the need by adding teacher perspectives on BL implementation to increase student engagement. BL by station rotation method has opportunities for developing 21st-century learners. With every implementation all stakeholders become more skilled, urging the high school educators to rethink their roles in classrooms.

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Differences in the Performance of African American Students by Gender on the Algebra I End-of-Course Exam: A Multiyear, Statewide Investigation

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Introduction

Education is a way of imparting knowledge and skills, promotes innovative thinking and creativity, and is a tool to achieve success. According to Long et al. (2012), students who take advanced courses in high school should experience higher performance in as indicated by grades, achievement scores, and graduation rates; college entrance, performance, and completion rates; and success in the labor market. Unlike other disciplines, literacy in mathematics is a key predictor of postsecondary success. Jeongeun et al. (2015) stated that a thoroughly developed understanding of algebra is needed to have access to advanced educational and career opportunities. Domina (2014) analyzed the selection process into advanced middle school mathematics courses and estimated the effects of advanced courses on students' mathematics. He documented advanced middle school mathematics courses improved student achievement. Evidence was provided to support the need to emphasize the importance of mathematics curricula in middle and high schools (Domina, 2014).

Proficiency in algebra is a gatekeeper to success in advanced mathematics courses, high school graduation, college admission and completion, and obtaining employment in STEM careers (Hughes et al., 2014). Researchers (e.g., Domina, 2014; Rickles, 2013) have established that taking algebra in eighth grade was associated with higher mathematics achievement when the students were prepared to take algebra earlier. According to a publication from the National Academies of Science, Engineering, and Medicine (2022), many African American students do not take advanced math in middle school. Sparks (2020) in a recent article called out that “separate algebra is unequal algebra” even when algebra is offered to students in higher-poverty middle schools (p.7). In other words, algebra in higher-poverty middle schools is often not taught in the same depth as at more affluent schools.

According to the U.S. Department of Education Office for Civil Rights (2018), African American students represent 17% of students enrolled in Grade 8, but only 11% were enrolled in Algebra I. Students who cannot pass a lower-level course such as Algebra I many times cannot access more advanced mathematics coursework which leads to a lack of postsecondary readiness. Many students have to repeat Algebra I because they are not exposed to many algebraic thinking and problem-solving skills while in elementary and middle school (Sawchuk, 2018). These skills are critical to success later on in Algebra I. According to Flores (2007) and Davis (2014), African American students have fewer opportunities to take high-level mathematics courses because of their limited mathematics achievement. Flores (2007) further noted that enrollment in Grade 8 mathematics courses greatly influenced the opportunity to take advanced mathematics courses before graduating from high school. These notions are important due to the effect of the pandemic on mathematics achievement.

According to the National Center for Education Statistics (2022), a 13-point score decrease occurred among African American students compared to a 5-point decrease for White students, resulting in a widening of the White-African American score gap from 25 points in 2020 to 33 points in 2022 in mathematics. The access of African American students to advanced mathematics courses may be affected due to the decline, which is

another area of concern. Hypotheses have been made regarding the factors that contribute to the achievement gap. White students take, on average, advanced academic courses at a higher rate than Black students (Corra et al., 2011; Rodriguez & McGuire, 2019). White students also take advanced academic courses at a higher rate than Hispanic students (Sawchuk, 2018). Enrollment in advanced academic courses is one example of the gap in opportunities that students of color face (Carter & Welner, 2013; Darling-Hammond, 2018). Because White students are exposed to more rigorous curriculum than are Black and Hispanic students, they perform better on standardized examinations. These gaps in mathematics performance are present even before students reach their Algebra I course in high school.

Federal education legislation such as The Elementary and Secondary Education Act of 1965, The No Child Left Behind Act of 2001, and most recently, the Every Student Succeeds Act of 2015 have placed a clear focus on student academic achievement and accountability for all students. Consequently, educational leaders have placed a clear emphasis on reducing academic disparities between student groups enrolled in public schools (Fraga & Slate, 2020). One of the major student groups who have evident disparities are African Americans. According to the National Center for Education Statistics (2020a), the percentage of African American students enrolled in public schools across the United States in the fall of 2017 was 15%, or about 7.6 million African Americans. That percentage was in comparison to the fall of 2000 where 17% of public-school enrollment, or 8 million students were African American across the United States (National Center for Education Statistics, 2020a). Only 8% of African American students in Grade 12 performed at or above the National Assessment of Educational Progress proficiency level on the mathematics assessment. According to the National Center for Education Statistics (2020b) among racial/ethnic groups, the average mathematics score at Grade 12 for White students was 31 points higher than the average score at Grade 12 for their African American peers in 2019. The 31-point White to African American score gap in 2019 was not substantially different from the 30-point score gap in 2015, the previous assessment year, nor from the 31-point score gap in 2005. The roots of the achievement gap trace back to the post-Civil War Era, with educational disparities exacerbated by Jim Crow Laws (Spires, 2015). The notion of separate but equal educational facilities for White students and non-White students were certainly part of the problem. Neither past Supreme Court cases (e.g., *Brown v. Board of Education of Topeka, 1954*), nor past presidential intercessions (e.g., President Eisenhower sending federal troops to Central High School in Little Rock, Arkansas in 1957) were able to mitigate the crisis that has been and continues to be manifested. Specifically, the mathematics achievement for African American students has been and remains problematic.

With respect to the state of interest for this article, Texas, the Texas Education Agency reported data from the 2017-2018 school year that 12.6%, or 680,359 PreK-12 students, were African Americans in Texas (Texas Education Agency, 2018). In the 2017-2018 school year, more than half of all students, 51.3%, were male. These enrollment numbers by gender were not reported separately by student ethnicity/race. The Texas Education Agency (2018) documented that 74.6% of African American students were economically disadvantaged, which was an increase from the previous year. These

percentages of African American students pose a challenge in determining specific achievement data for African American boys and African American girls based on their gender and economic status. Information is available for the African American group overall, but little comparative data is present for students in that particular group. African American students in Texas have not performed as well as their peers on state-mandated mathematics assessments, including the Algebra I End-of-Course exam. This course and course exam are important in that they constitute a gateway high school graduation requirement.

In 2003, Texas implemented the Texas Assessment of Knowledge and Skills as the state mandated assessment. This assessment allowed Texas to demonstrate compliance with the No Child Left Behind Act while increasing the expectations for students' academic performance. The Texas Assessment of Knowledge and Skills exams were designed to measure students' knowledge and mastery of skills across multiple core content areas (e.g., Reading, Mathematics, Science, and Social Studies). However, as evidenced by test scores in Texas, many children were not meeting the achievement standards. Alford-Stephens (2016) examined the degree to which differences were present in mathematics achievement in the Texas Assessment of Knowledge and Skills Mathematics Exit-Level exam for the 2004-2005 through the 2011-2012 school years as a function of student ethnicity/race (i.e., Asian, White, Hispanic, and African American). Asian boys had the best mathematics performance over this 8-year time period, followed by White boys, then Hispanic boys, and last African American boys. Statistically significantly lower mathematics performance was established for Hispanic and African American boys in comparison to Asian and White boys. African American boys had the poorest performance on all of the 10 mathematics objectives in each year of the 8-year time span.

The Alford-Stephens (2016) investigation is very relevant to this article because the state-mandated assessment that she analyzed is aligned to the Algebra I End-of-Course exam, as they are both state exit graduation requirements for mathematics. With respect to this study, the degree to which differences might be present in mathematics between African American boys and African American girls was investigated. As it pertains to the STAAR Algebra I End-of-Course exam, the Texas Education Agency (2019b) reported that 76% of African American students performed at the Approaches Grade Level Standard; 47% of African American students performed at the Meets Grade Level Standard; and 25% of African American students performed at the Masters Grade Level Standard. These results were in comparison to the 84% of all students who performed at the Approaches Grade Level Standard; 62% of all students who performed at the Meets Grade Level Standard; and 39% of all students who performed at the Masters Grade Level Standard. Apparent in this set of statistics are the gaps in the mathematics performance of African American students in Texas.

Though gender gaps have narrowed in recent decades, women remain underrepresented in many mathematics fields (Leaper et al., 2012). Girls tend to do as well as boys in mathematics during their adolescence. Comparative to these studies, Reilly et al. (2019) documented that boys and girls had similar mathematics performance. According to Reilly et al. (2019), gender differences in mathematics have been reported throughout the years, but no major evidence has been documented of the presence of

large gaps. In fact, most of the gaps are considered trivial because they are so small. Voyer and Voyer (2014) established that girls consistently receive higher school grades for all course content areas than boys. In contrast, in meta-analyses of performance on standardized tests, girls have not outperformed boys on standardized assessments, SAT, ACT, and AP exams.

With respect to gender and Algebra I End-of-Course exams, the Texas Education Agency (2019b) reported that 80% of boys performed at the Approaches Grade Level Standard on the Algebra I End-of-Course exam; 56% of boys performed at the Meets Grade Level Standard; and 35% of boys performed at the Masters Grade Level Standard. These results were in comparison to the 88% of girls who performed at the Approaches Grade Level Standard; 67% of girls who performed at the Meets Grade Level Standard; and 44% of girls who performed at the Masters Grade Level Standard. On all three mathematics measures, higher percentages of girls met the standards than did boys. After an extensive and intensive review of the extant literature, no published research articles could be located in which Algebra I exam data had been analyzed with respect to the performance of African American boys when compared to African American girls.

Statement of the Problem

Although information related to mathematics achievement and participation are accessible, limited data associated with the simultaneous intersections of race and gender as it pertains to mathematics achievement are available. Basic mathematics achievement data for African American girls is often unavailable by standard reporting procedures or the data on race and gender are usually released or separately analyzed in mathematics (Gholson, 2016). According to Thompson and Lewis (2005), limited attention has been placed on the success of African American boys in mathematics although an overwhelming amount of literature exists related to their academic achievement, schooling experiences, and life conditions. Although student mastery of Algebra I concepts is considered a predictor of career and college readiness, students enrolled in Grade 8 algebra in predominantly minority schools will receive less algebra and other advanced mathematics content than their peers in low minority schools (Morton & Riegle-Crumb, 2020). Without sufficient access to mathematics data for African American girls and boys, decisions about educational practices, instructional strategies, and interventions to improve student outcomes will not be well-informed.

Purpose of the Study

The purpose of this study was to determine the degree to which differences were present in overall mathematics achievement by gender for Texas African American students. Specifically addressed was performance in mathematics at the Approaches Grade Level, Meets Grade Level, and Masters Grade level standards to ascertain whether gender gaps were present. Three years of the State of Texas Assessments of Academic Readiness (STAAR) Algebra I End-of-Course assessment data was analyzed to determine the degree to which differences existed inl mathematics achievement between African

American girls and boys. Furthermore, after analyzing three years of school statewide data, the extent to which trends were present in overall mathematics achievement was determined.

Significance of the Study

As of the time of this study, few researchers have examined the degree to which differences were present between African American boys and African American girls on the Texas state-mandated Algebra I End-of-Course exam. Additionally, little published literature could be located in which Texas exam data has been analyzed with respect to the performance of African American boys and girls on the Algebra I End-of-Course assessment in Texas. Much of the literature about the achievement gap of African American students in the State of Texas is focused on comparative data with other ethnic/racial groups of students in mathematics. Researchers can use findings from this multiyear analysis to add to the existing literature.

Research Questions

The following overarching research question was addressed in this study: What is the difference between African American girls' and boys' performance on the Algebra I End-of-Course exam? Specific sub-questions under this overarching research question was: (a) What is the difference in the Algebra I End-of-Course Approaches Grade Level performance between African American girls and boys?; (b) What is the difference in the Algebra I End-of-Course Meets Grade Level performance between African American girls and boys?; (c) What is the difference in the Algebra I End-of-Course Masters Grade Level performance between African American girls and boys?; and (d) To what extent were trends present in the three Grade Level standards across the three school years of data? The first three research questions were addressed separately for the 2016-2017, 2017-2018, and 2018-2019 school years, whereas the fourth research question involved all three school years so that trends could be identified.

Method

Research Design

For this multi-year investigation, a causal-comparative research design was present (Johnson & Christensen, 2020). Archival data, which are sometimes referred to as secondary data, was analyzed. Participants in this study were African American girls and African American boys who had taken the Algebra I End-of-Course exam. The dependent variables of student mathematics performance have previously occurred. In this study, archival data was acquired from the Texas Education Agency Public Education Information Management System and was analyzed to determine the degree to which differences were present in mathematics performance for Texas African American students. The dependent variables in this study were student performance levels on the STAAR Algebra I End-of-Course exam (i.e., Approaches Grade Level, Meets Grade Level, Masters Grade Level) for

the 2016-2017 through the 2018-2019 school years for African American girls and boys. In 2020, the spring STAAR tests were canceled due to the pandemic, and in the 2021 school year, the Commissioner of Education gave families the option to send their child to school to test if families had no health or safety concerns. This allowance from the Commissioner resulted in reduced participation compared to typical years; therefore, data was not obtained for the pandemic years.

Participants and Instrumentation

Participants in this study were African American girls and African American boys who had taken the Algebra I End-of-Course exam. Three measures of mathematics were present on this exam: Approaches Grade Level, Meets, Grade Level, and Masters Grade Level. The achievement data for this study were obtained through a Public Information Request to the Texas Education Agency's Public Education Information Management System. Data was then imported into the Statistical Package for Social Sciences software program for analysis.

The Texas Education Agency (2017) suggested that performance in the Approaches Grade Level category indicates that students are likely to succeed in the next grade or course with targeted academic intervention. Students in this category generally demonstrate the ability to apply the assessed knowledge and skills in familiar contexts (Texas Education Agency, 2017). If students perform in the Meets Grade Level category, this performance indicates they have a high likelihood of success in the next grade or course but may still need some short-term, targeted academic intervention. Students in this category generally demonstrate the ability to think critically and apply the assessed knowledge and skills in familiar contexts (Texas Education Agency, 2017). Student performance in the Masters Grade Level category indicates that students are expected to succeed in the next grade or course with little or no academic intervention. Students in this category demonstrate the ability to think critically and apply the assessed knowledge and skills in varied contexts, both familiar and unfamiliar (Texas Education Agency, 2017).

Results

To ascertain whether differences were present in STAAR Algebra I End-of-Course exam performance (i.e., Did Not Meet, Met) at the Approaches Grade Level, Meets Grade Level, and Masters Grade Level standards between African American boys and African American girls for the 2016-2017, 2017-2018, and 2018-2019 school years, Pearson chi-square analyses were conducted. This statistical procedure was viewed as the optimal statistical procedure to use because frequency data was present for STAAR Algebra I End-of-Course Grade Level standards and for gender. As such, chi-squares are the statistical procedure of choice when variables are categorical (Slate & Rojas-LeBouef, 2011). In addition, with the sample size, the available sample size per cell was more than five. Therefore, the assumptions for using Pearson chi-square procedures were met.

Approaches Grade Level Analyses Across All Three School Years

For the first research question on the Algebra I End-of-Course Approaches Grade Level

standard for the 2016-2017 school year, the result was statistically significant, $\chi^2(1) = 1075.42$, $p < .001$. The effect size for this finding, Cramer's V, was small, .15 (Cohen, 1988). As revealed in Table 1, a statistically significantly higher percentage of African American girls, more than 15 percentage points, met the STAAR Algebra I End-of-Course exam Approaches Grade Level standard than did African American boys.

Table 1

Frequencies and Percentages of STAAR Algebra I End-of-Course Approaches Grade Level Performance Standard by African American Gender for All Three School Years

School Year and Gender	Did Not Meet *n* and %age of Total	Met *n* and %age of Total
2016-2017		
Boys	(*n* = 12,339) 48.2%	(*n* = 13,262) 51.8%
Girls	(*n* = 6,798) 33.1%	(*n* = 13,760) 66.9%
2017-2018		
Boys	(*n* = 10,869) 44.4%	(*n* = 13,634) 55.6%
Girls	(*n* = 5,528) 28%	(*n* = 14,188) 72%
2018-2019		
Boys	(*n* = 9,609) 42.1%	(*n* = 13,218) 57.9%
Girls	(*n* = 4,560) 24.7%	(*n* = 13,919) 75.3%

With respect to the 2017-2018 school year, the Pearson chi-square revealed the presence of a statistically significant difference, $\chi^2(1) = 1247.15$, $p < .001$, Cramer's V of .17, small effect size (Cohen, 1988). As delineated in Table 1, a statistically significantly higher percentage of African American girls, more than 16 percentage points higher, met the STAAR Algebra I End-of-Course exam Approaches Grade Level standard than did African American boys. Concerning the 2018-2019 school year, a statistically significant difference was yielded, $\chi^2(1) = 1374.83$, $p < .001$, small effect size, Cramer's V = .18 (Cohen, 1988). A statistically significantly higher percentage of African American girls, more than 17 percentage points higher, met the STAAR Algebra I End-of-Course exam Approaches Grade Level standard than did African American boys. Descriptive statistics for this analysis are contained in Table 1.

Meets Grade Level Analyses Across All Three School Years

Regarding the 2016-2017 school year for the STAAR Algebra I End-of-Course Meets Grade Level standard, a statistically significant result was yielded, $\chi^2(1) = 821.97$, $p < .001$,

small effect size, Cramer's V = .13 (Cohen, 1988). A statistically significantly higher percentage of African American girls, more than 12 percentage points higher, met the STAAR Algebra I End-of-Course Meets Grade Level standard than did African American boys. Table 2 contains the descriptive statistics for this analysis.

Table 2

Frequencies and Percentages of STAAR Algebra I End-of-Course Meets Grade Level Performance Standard by African American Gender for All Three School Year

School Year and Gender	Did Not Meet *n* and %age of Total	Met *n* and %age of Total
2016-2017		
Boys	(*n* = 19,939) 77.9%	(*n* = 5,662) 22.1%
Girls	(*n* = 13,548) 65.9%	(*n* = 7,010) 34.1%
2017-2018		
Boys	(*n* = 18,446) 75.3%	(*n* = 6,057) 24.7%
Girls	(*n* = 12,036) 61.0%	(*n* = 7,680) 39%
2018-2019		
Boys	(*n* = 15,932) 69.8%	(*n* = 6,895) 30.2%
Girls	(*n* = 9,642) 52.2%	(*n* = 8,837) 47.8%

With respect to the 2017-2018 school year, the result was statistically significant, $\chi^2(1) = 1033.59$, $p < .001$, small effect size, Cramer's V = .15 (Cohen, 1988). As revealed in Table 2, a statistically significantly higher percentage of African American girls, more than 14 percentage points higher, met the STAAR Algebra I End-of-Course Meets Grade Level standard than did African American boys. Concerning the 2018-2019 school year, a statistically significant difference was yielded, $\chi^2(1) = 1343.98$, $p < .001$, small effect size, Cramer's V = .18 (Cohen, 1988). A statistically significantly higher percentage of African American girls, more than 17 percentage points higher, met the STAAR Algebra I End-of-Course exam Meets Grade Level standard than did African American boys. Descriptive statistics for this analysis are contained in Table 2.

Masters Grade Level Analyses Across All Three School Years

For the third research question on the STAAR Algebra I End-of-Course exam Masters Grade Level standard, the result was statistically significant, $\chi^2(1) = 410.47$, $p < .001$. The effect size for this finding, Cramer's V, was below small, .09 (Cohen, 1988). As presented in Table 3, a statistically significantly higher percentage of African American girls, 5

percentage points higher, met the STAAR Algebra I End-of-Course exam Masters Grade Level standard than did African American boys during the 2016-2017 school year.

Table 3

Frequencies and Percentages of STAAR Algebra I End-of-Course Masters Grade Level Performance Standard by African American Gender for All Three School Years

School Year and Gender	Did Not Meet *n* and %age of Total	Met *n* and %age of Total
2016-2017		
Boys	(*n* = 23,840) 93.1%	(*n* = 1,761) 6.9%
Girls	(*n* = 18,009) 87.6%	(*n* = 2,549) 12.4%
2017-2018		
Boys	(*n* = 22,192) 90.6%	(*n* = 2,311) 9.4%
Girls	(*n* = 16,324) 82.8%	(*n* = 3,392) 17.2%
2018-2019		
Boys	(*n* = 19,891) 87.1%	(*n* = 2,936) 12.9%
Girls	(*n* = 13,912) 75.3%	(*n* = 4,567) 24.7%

Concerning the 2017-2018 school year, a statistically significant difference was yielded, $\chi^2(1) = 587.57$, $p < .001$, small effect size, Cramer's V of .12 (Cohen, 1988). As revealed in Table 3, a statistically significantly higher percentage of African American girls, more than 7 percentage points higher, met the STAAR Algebra I End-of-Course exam Masters Grade Level standard than did African American boys. With respect to the 2018-2019 school year, a statistically significant difference was revealed, $\chi^2 (1) = 965.12$, $p < .001$, small effect size, Cramer's V = .15 (Cohen, 1988). A statistically significantly higher percentage of African American girls, more than 11 percentage points higher, met the STAAR Algebra I End-of-Course exam Masters Grade Level standard than did African American boys. Delineated in Table 3 are the descriptive statistics for this analysis.

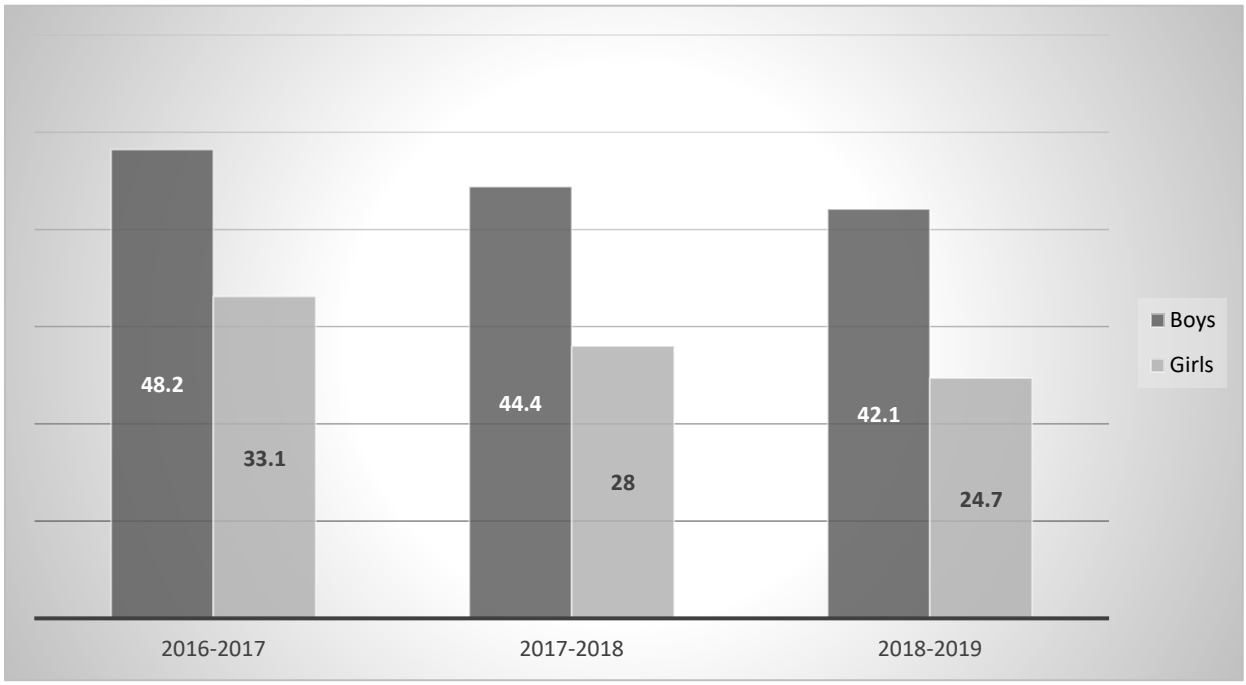
Algebra I End-of-Course Exam Performance Across All Three School Years

Concerning the Approaches Grade Level standard, African American girls outperformed African American boys in all three school years. The percentages of African American girls and African American boys who met the Approaches Grade Level standard consistently increased each school year. Regarding African American girls, 66.9% met the Approaches Grade Level standard in 2016-2017, 72% met the approaches Grade Level standard in 2017-2018, and 75.3% met the Approaches Grade Level standard in 2018-

2019. In reference to African American boys, 51.8% met the Approaches Grade Level standard in 2016-2017, 55.6% met the Approaches Grade Level standard in 2017-2018, and 57.9% met the Approaches Grade Level standard in 2018-2019. The percentages of African American boys and African American girls who did not meet this Grade Level standard are depicted in Figure 1.

Figure 1

Percentages of African American Students by Gender Who Did Not Meet the STAAR Algebra I End-of-Course Approaches Grade Level Performance Standard for All Three School Years



With respect to the Meets Grade Level standard, African American girls consistently outperformed African American boys in all three school years. Similar to the Approaches Grade Level standard, higher percentages of African American girls met this standard than African American boys in each school year. Despite the increase in performance each year, more than three-fourths of African American boys and almost two-thirds of African American girls did not meet the Meets Grade Level standard in the 2016-2017 school year; about three-fourths of African American boys and more than one-half of African American girls did not meet the Meets Grade Level standard in the 2017-2018 school year; and more than two-thirds of African American boys and slightly more than one-half of African American girls did not meet the Meets Grade Level standard in the 2018-2019 school year. Portrayed in Figure 2 are the percentages of African American boys and African American girls who did not meet this Grade Level standard.

Figure 2

Percentages of African American Students by Gender Who Did Not Meet the STAAR Algebra I End-of-Course Meets Grade Level Performance Standard for All Three School Years

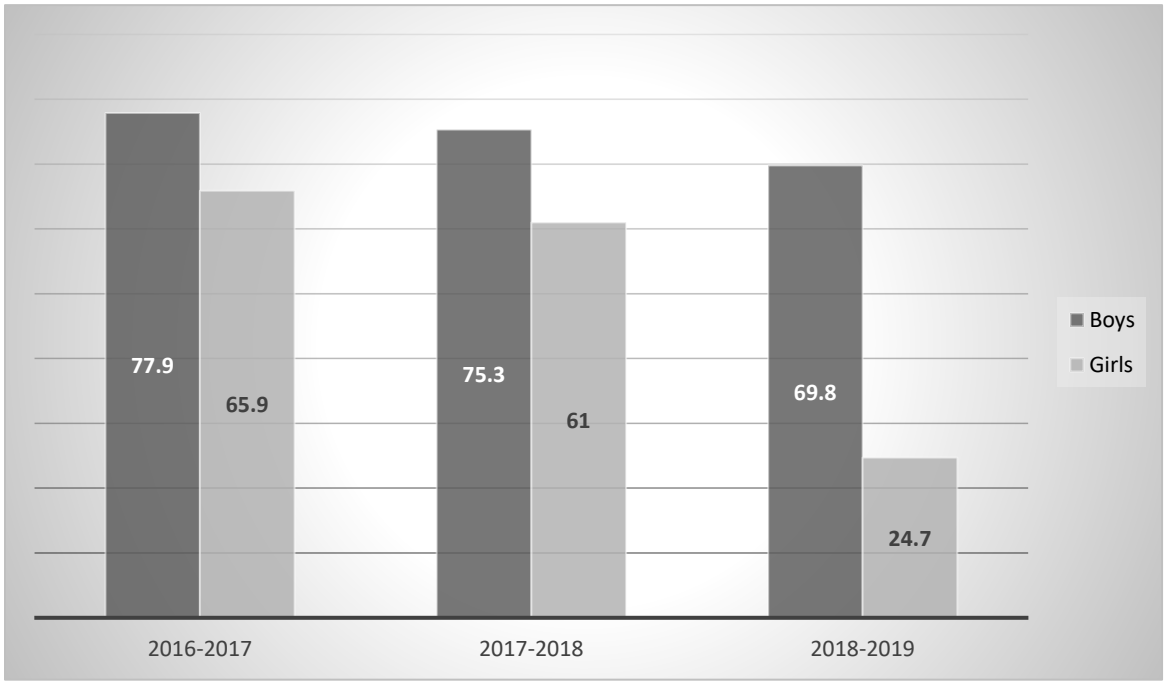
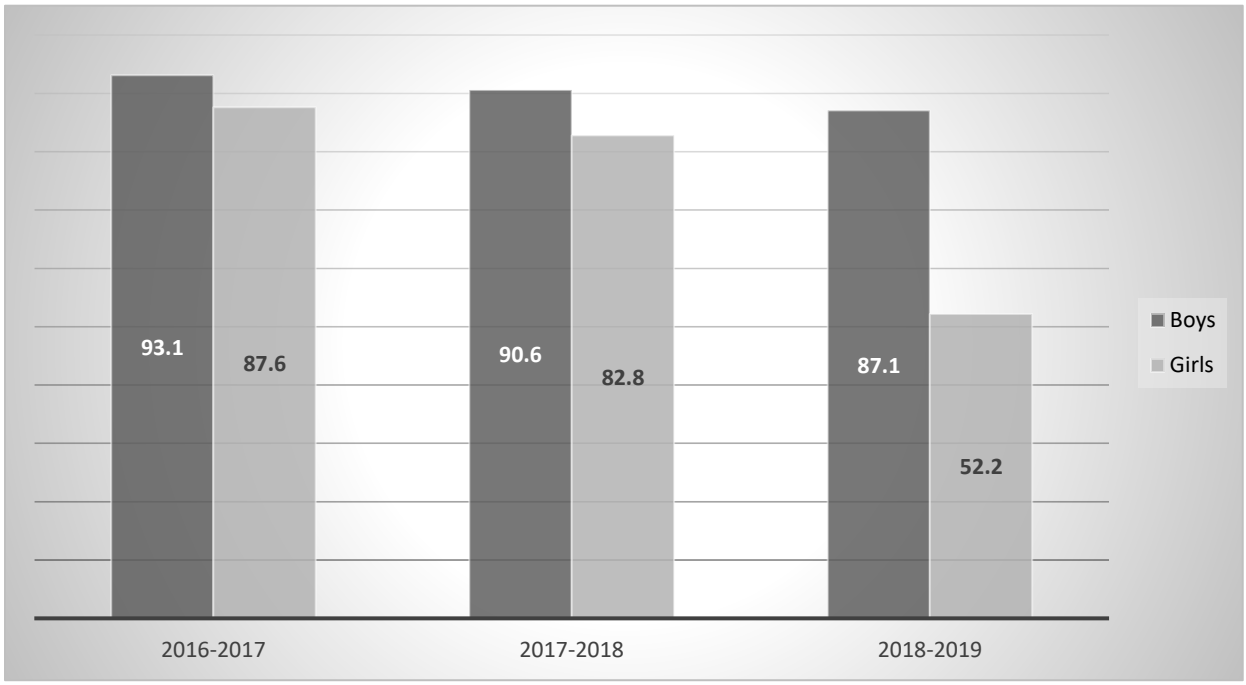


Figure 3

Percentages of African American Students by Gender Who Did Not Meet the STAAR Algebra I End-of-Course Masters Grade Level Performance Standard for All Three School



In regard to the Masters Grade Level standard, African American girls outperformed African American boys in all three school years. In comparison to the other two Grade Level standards, lower percentages of African American boys and African American girls met the Masters Grade Level standard. In all three school years, 2016-2017, 2017-2018, and 2018-2019, more than 75% of African American boys and African American girls did not meet this standard. Depicted in Figure 3 are the percentages of African American boys and girls who did not met this Grade Level standard.

Discussion

In this Texas, statewide investigation, Algebra I End-of-Course exam performance was investigated by African American student gender. Three Grade Level standards were addressed: Approaches Grade Level, Meets Grade Level, and Masters Grade Level. Statistically significant differences were revealed between African American boys and girls for all three Grade Level standards in all three school years. African American girls outperformed African American boys in all instances. The performance gaps between African American girls and African American boys increased each year.

An issue of concern based on the results was that 48.2% of African American boys and 33.1% of African American girls did not meet any Grade Level standard in the 2016-2017 school year. In regard to the 2017-2018 school year, 44.4% of African American boys and 28% of African American girls did not meet any Grade Level standard. For the last school year of data analyzed, 42.1% of African American boys and 24.7% of African American girls did not meet any Grade Level standard. Although the performance of African American girls and boys consistently improved, academic disparities between African American students and their peers are still prevalent.

Connections to Existing Literature

As evident in this multiyear statewide investigation, African American girls performed statistically significantly higher than African American boys in the three school years of data that were analyzed. These findings are consistent with Voyer and Voyer (2014) who established that girls consistently receive higher school grades for all course content areas than boys. Although Reilly et al. (2019) suggested that clear statistically significant differences between boys and girls have not been established, results contained in this study are congruent with Texas Education Agency (2019) data which showed that on all three mathematics measures, higher percentages of girls met the standards than did boys. Moreover, Paschall et al. (2018) contended that the intersectionality of multiple student demographics (e.g., economic status, gender, or ethnicity/race) should be addressed when performing analyses on educational equity. Findings from this investigation add to the existing research literature that African American girls outperform African American boys, results that are consistent with the extant research literature.

Implications for Policy and Practice

Several implications for policy and practice are present based on the findings of this multi-year investigation. Policymakers are encouraged to continue funding and advocating for African American students in the State of Texas as achievement gap numbers continue to consistently increase. Additionally, funds and resources should be allocated to communities that serve high populations of African American students, specifically African American students in poverty. These funds should be used to provide families with the necessary academic support to help students when they enter school.

Regarding instructional practices, teacher preparation programs must include curricula to help aspiring teachers understand the complexities of educating students from different economic backgrounds and advocate the use of culturally responsive teaching methods in mathematics. At the school level, district leadership should mandate professional development to help teachers stay abreast of best practices. Also, educators are encouraged to continue implementing new interventions geared toward African American students in the form of tutorials and general intervention groups. Lastly, a concerted effort should be made toward general awareness of the consistent gaps between African American and their peers.

Recommendations for Future Research

Based on the results of this investigation, several recommendations for future studies can be made. First, only data on African American boys and girls in the State of Texas were the focus of this investigation. As such, researchers are encouraged to extend this study to other states to determine whether these results discussed herein are generalizable to other states. Second, because only Algebra I End-of-Course test data was examined in this investigation, researchers are encouraged to analyze data in Biology, English I, English II, and U.S. History which students in Texas are required to take to fulfill graduation requirements. Third, African American boy and girls were the only student group whose data was analyzed. Hence, researchers should consider analyzing performance for other student groups such as students identified as being at-risk, students enrolled in special education, and students in poverty. Lastly, researchers should examine the extent to which results in this investigation would be generalizable based on demographic characteristics such as ethnicity/race (e.g., Hispanic, Asian, and White).

Conclusion

In this article, the extent to which differences were present between African American boys and girls in their performance on the Texas state-mandated Algebra I End-of-Course exam was addressed. Specifically examined was the extent to which African American boys and girls differed in their performance on three Grade Level performance measures: Approaches Grade Level, Meets Grade Level, and Masters Grade Level during the 2016-2017, 2017-2018, and 2018-2019 school years. Statistically significant

differences were documented in the Algebra I End-of-Course exam performance of African American boys and girls. Statistically significantly higher percentages of African American girls met the three Grade Level standards in all three school years than did African American boys. Of concern were the high percentages of African American girls and African American boys who did not meet any Grade Level standard.

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