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Comparison of Traditional to Hybrid Modality of Instruction

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COMPARISON OF TRADITIONAL
TO HYBRID MODALITY
OF LEARNING

by

Paul Michael Spadaro

A dissertation submitted to the faculty of Coastal Carolina University
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Education
with a specialization in Educational Leadership

Education Sciences and Organizations

Coastal Carolina University

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Doctoral Committee:

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ABSTRACT

The COVID-19 pandemic caused unprecedented disruption in education across the United States. Prior to the pandemic, students in third grade struggled with low reading proficiency, a difficulty that predicts persistent academic struggles, school dropout, and even delinquency. Districts in South Carolina and around the United States adapted to the challenges of the COVID-19 pandemic in various ways, and among these strategies were a traditional learning modality, where students attended school only in-person and when possible, and a hybrid learning modality, where students alternatively attended in-person and remotely. It is important to understand the potential impacts of these scheduling decisions on student performance, particularly in third grade reading. The purpose of the proposed quantitative causal comparative study was to examine whether third grade students' reading performance, as measured by the SC READY ELA assessment, vary as a function of students' enrollment in a district using a hybrid modality of instruction as compared with a traditional modality during the 2020-2021 school year. Data from districts using hybrid and traditional schedules were analyzed, representing 1,455 students. Results indicated that students on hybrid schedules had significantly higher mean scores than students on traditional schedules, particularly for male, female, and White students. Follow-up interviews with superintendents revealed that districts were generally unprepared for the pandemic and that roles of parents, teachers, and leaders changed significantly during the pandemic. Additionally, superintendents focused on making informed decisions, reducing inequities in learning related to technology

access, and supported instruction using technology. Taken together, the quantitative findings and experiences of superintendents support the need for increased preparedness for potential future disruptions to education and concerted effort on the part of all stakeholders to ensure continuity of instruction and adequate support for all students.

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CHAPTER 1

INTRODUCTION

In both public parlance and the academic literature, debates are ongoing about the utility of educational technology. Parents, teachers, students, and researchers alike seek to understand and argue whether online technology can successfully improve the quality and efficiency of teaching in public schools (Baum & McPherson, 2019; Kaden, 2020; Raes et al., 2020a). This debate existed before the COVID-19 pandemic, but the rise of emergency remote learning because of the pandemic made it much more relevant. As a measure to protect staff, students, and families, school districts took aggressive steps to move educational content online, functionally ushering in an era of at least temporary “blended” learning that combined degrees of online and in-person learning (Dorn et al., 2020; Kaden, 2020).

Nearly half of the 907 public school districts in the US opened schools fully remote in 2020 (Rosenburg, 2020). This includes more than three-quarters of the nation's largest communities, which serve high proportions of students with the most significant learning and social-emotional needs stemming from the pandemic (Rosenburg, 2020). Public school districts had to pivot and offer diverse learning modalities for student safety and accountability. Most public school districts relied on providing a hybrid modality of instruction to enhance student learning, where students attended school

remotely one or more days per week and attended in-person one or more days per week (Baum & McPherson, 2019). Researchers stated hybrid learning could offer a transformative experience in which new modes of education can challenge teachers to consider the best ways to educate students (Baum & McPherson, 2019). However, there is evidence that gaps remain in providing effective hybrid learning (Kaden, 2020; Raes et al., 2020a) as compared with traditional, in-person learning.

In particular, although some expected that the move to a hybrid approach to learning would benefit students, large scale implementation of hybrid and online learning has led to many detriments. In particular, loss, disparities, and ineffective learning have been associated with the use of online learning in public schools (Kaden, 2020; Raes et al., 2020a; Raes et al., 2020b). In the 2019-2020 school year, there was evidence that students were falling behind in fully online and hybrid platforms (Dorn et al., 2020). Based on the existing discrepancies regarding the benefits of hybrid education for public schools and high school students specifically, additional research is needed (Kaden, 2020). In particular, while many colleges and universities have been engaging students through online courses for the past decade, there is a lack of understanding of the effectiveness of online classes in hybrid models for elementary students (Raes et al., 2020a).

There is evidence that hybrid classrooms, when effectively implemented, can be better than traditional models and improve students' abilities, especially in disadvantaged schools (Baum & McPherson, 2019). Using online learning media can enhance interaction and communication in schools as in conventional classrooms. Students in a hybrid model can freely communicate and share with teachers and classmates the

material presented (Baum & McPherson, 2019). However, in contrast to the identified benefits of hybrid classrooms for elementary students, other researchers have highlighted the issue of disparities faced by students in the hybrid model (Dorn et al., 2020; Raes et al., 2020a; Raes et al., 2020b). It is possible that the benefits of hybrid learning documented in the literature are a result of the collegiate context. It is also possible that detriments have only been encountered because of the haphazard and emergency nature of online learning as it relates to COVID-19. More research is needed into the impacts of hybrid learning in elementary school students.

1.1 Problem Statement

The problem in this study was the low student proficiency of students in third-grade reading courses in South Carolina. The broader problem that was explored was whether, in the elementary language arts setting, hybrid modeled courses produced higher knowledge acquisition levels than students in the traditional face-to-face environment where teachers used the direct instruction model of teaching. Building reading skills at this grade level is critical: Students reading below grade level in third grade are at increased risk of persistent academic struggles, school dropout, and even delinquency (Lee-St. John et al., 2018; Simonton, 2016; Wolter, 2017). At the same time, developing strong reading skills by third grade are well-situated for success going forward (Walz, 2020). Hence, third grade reading proficiency is considered a very important outcome.

Because of the importance of third grade reading, South Carolina has determined that it must assess all students to exhibit proficiency in third-grade reading standards (South Carolina Department of Education, 2021). This assessment centers around

standardized testing to demonstrate mastery of content and performance standards. Results from the 2020-2021 third grade reading end-of-course (EOC) assessment indicate that, at present, only approximately 45% of students scored Meets Expectations (26%) or Exceeds Expectations (19%) across the state of South Carolina when accounting for grades 3 through 8 (South Carolina Department of Education, 2021). The problem examined in this study, therefore, was the impact of the hybrid modality of learning on third grade reading EOC scores. The independent variables of interest were (a) hybrid learning, (b) race/ethnicity, (c) socioeconomic status, (d) SPED status, and (e) gender. The dependent variable of interest was third grade reading EOC scores.

1.2 Nature of the Study

1.2.1 Purpose of the Study

The purpose of this quantitative causal comparative study was to examine the impact that hybrid modality of learning had on third grade reading EOC scores during the 2020-21 school year in public elementary schools in South Carolina. Specifically, the study examined whether third grade students' reading performance, as measured by the SC READY ELA assessment, vary as a function of students' enrollment in a district using a hybrid modality of instruction as compared with a traditional modality during the 2020-2021 school year. Overall, there is a demand for additional research on the outcomes of hybrid learning for K-12 (Dorn et al., 2020; Raes et al., 2020a; Raes et al., 2020b). The findings of this study can be used to address a gap due to the lack of quantitative data on the impact of hybrid learning environments, specifically in third-grade reading

classrooms. The results of this study may offer further support to the body of knowledge needed to address this problem by adding new quantitative data on student knowledge acquisition in hybrid courses and guiding classroom teachers in developing curriculum and teaching methodology. The findings of this study can be used to guide school districts in developing a hybrid curriculum and teaching methodology to engage students better and yield improved outcomes in hybrid learning.

1.2.2 Research Questions

The research questions and associated hypotheses used to guide this study were as follows:

RQ1: What is the difference in third grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year?

H1o: There is no difference in third grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year.

H1a: There is a difference in third grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year.

1.2.3 Methods

The research methodology for the study was quantitative. A quantitative methodology is most appropriate to examine a numeric relationship between these variables (Creswell & Creswell, 2018). Secondary data were used to measure the variables of interest, as detailed in Chapter 3. The independent variables of interest were (a) hybrid learning, (b) race/ethnicity, (c) socioeconomic status, (d) SPED status, and (e) gender. The dependent variable of interest was third grade reading EOC scores. The relationship between these variables was assessed using a causal comparative design, also called an *ex post facto* design, which is ideal for examining the differences between two or more circumstances that diverged naturally (Johnson, 2001). The research questions were answered through analysis using independent samples *t*-tests to determine if EOC scores significantly differed when any of the independent variables differed. This methodological choice aligns with the theoretical foundations of Piaget's (1954) cognitive constructivism theory of learning, which is detailed in the following section.

1.2.4 The Theoretical Base

The theoretical basis for the study rested on a theoretical understanding of hybrid learning and on a proper theory of learning. Hybrid learning represents a type of learning that blends online and in-person education (Baum & McPherson, 2019). The development of information technology has encouraged the emergence of various learning models of innovation in education, especially in learning systems that have changed conventional learning systems into modern learning systems based on information and communication technology (Suhartanto, 2009). Hybrid learning helps

provide access to the learning process without the constraints of time and place (Baum & McPherson, 2019). Hybrid learning combines several methods, models, and approaches to learning to achieve the same learning objectives (Sunaryo & Nuraida, 2018). Theories with hybrid learning blend direct instruction and cognitive constructivism learning theory into an instructional design model. When educators apply these learning theories, key elements emerge as essential avenues of a thriving hybrid learning environment (Carman, 2005). Less clear is how well the ideas in these theories apply in reality. Though the literature demonstrates that the idea of hybrid learning is conceptually sound, it is important to determine if this theoretical soundness carries over in terms of yielding better learning outcomes than traditional classroom learning. That was the question that the study intended to answer.

Specific theoretical support for learning through an online model can be found in Piaget's (1954) cognitive constructivism theory of learning, which asserts that individuals generate knowledge and produce meaning from their personal experiences, and then develop intellectually through that construction of knowledge. Piaget's cognitive constructivism theory provides a framework for teaching and learning, describing students' engagement in diverse learning environments (e.g., a hybrid learning modality) as promoting personal discovery and the construction of knowledge. In this study, the central tenets of Piaget's cognitive constructivism theory of learning were applied to an exploration of the use of combined learning modalities to enhance reading and writing achievement, drawing on Piaget's position that learning occurs when students are exposed to and interact with a variety of objects, environments, and experiences (Piaget, 1954). Given the role of factors, environments, and experiences in Piaget's theory, it is a natural

extension of the primary research question to also ask what other factors might influence the efficacy of hybrid learning for third grade reading. To this end, a number of experiential and environmental factors were incorporated into the study as the secondary independent variables. These factors were (a) race/ethnicity, (b) socioeconomic status, (c) SPED status, and (d) gender. Integrating these factors yielded more comprehensive results in alignment with Piaget's (1954) cognitive constructivism theory of learning.

1.3 Operational Definitions

The following key definitions were central to the proposed study:

End of course (EOC). EOC exams are those conducted at the end of a given academic year in a given subject area to assess a student's learning of the academic content taught for that subject (South Carolina Department of Education, 2019). EOC exams typically align with state or federal standards.

Hybrid learning. Hybrid learning is a format in which students attend school remotely one or more days per week and attend in-person one or more days per week (Baum & McPherson, 2019).

Third grade reading. Third grade reading is the level of reading expected of students who have completed the third grade. Reading level is indicated by students scoring Meets Expectations or Exceeds Expectations on EOC exams in the state of South Carolina (South Carolina Department of Education, 2019).

1.4 Assumptions, Limitations, Scope and Delimitations

1.4.1 Assumptions

Assumptions are foundational truths that a study is based on but that cannot be proven (Merriam & Tisdell, 2015). There are assumptions in all research. This study, therefore, also had key assumptions. The first assumption was that a quantitative study using secondary data can adequately address the research problem. This assumption was based on the use of quantitative research to study similar issues and on the existence of quantitative data that would seem appropriate for addressing the research problem. The second assumption was that the data for the study would be complete and free of errors. Because the data were recorded and entered into student records by others, there was a possibility of clerical errors or other contaminations of the data. As these could not be checked, they were assumed to be not present or only minor. Finally, the study assumed that EOC exams are an adequate measure of reading level. Standardized tests have often been criticized, but they are also the functional measure used by schools and by the state, so few alternatives exist.

1.4.2 Limitations

Limitations are weaknesses of a study (Creswell & Creswell, 2018). This study, like all research, also had limitations. The study was limited by the use of secondary data. Though very practical to use in terms of both resource investment and research ethics, secondary data use means that the researcher had no input on the data collection and had to use the data as they were. Secondly, the proposed study was limited by the set of chosen variables. These variables were chosen in alignment with the literature and logical

reasoning as those most likely to affect learning. Nonetheless, it was possible that the list of variables was inappropriate or substantially incomplete and therefore would not capture all the issues in play. Finally, the proposed study was limited by the potential for researcher bias. Such bias is always present to some degree. However, as detailed in Chapter 3, multiple sets of the methodology and presentation of results were dedicated to mitigating and minimizing the influence of researcher bias on the results.

1.4.3 Scope and Delimitations

The scope and delimitations of a study determine its focus (Merriam & Tisdell, 2015). Delimitations should be used to ensure the study addresses the desired issues. There were several delimitations in this study. First, the proposed study was delimited to the state of South Carolina as this was the context in which the problem was identified. Second, the study was delimited to third grade reading because of the identified importance of third grade reading in the literature. Third, the proposed study was delimited to the independent variables of (a) hybrid learning, (b) race/ethnicity, (c) socioeconomic status, (d) SPED status, and (e) gender because these are the factors deemed most relevant. The study's specific focus was delimited to the effect of hybrid learning because of the ongoing debate in the literature regarding the efficacy and prospective benefits of hybrid learning.

1.5 The Significance of the Study

This study is significant in several ways, including both practical and academic significance. The practical significance of the study is determined primarily by the need

to better understand the effects of hybrid learning. Third grade reading is especially important as a foundation for students' reading ability and later success (Lee-St. John et al., 2018; Simonton, 2016; Wolter, 2017). From this research, school districts may better understand the effects of hybrid courses on improving elementary school student achievement. By adopting online learning modules to create a hybrid classroom, elementary instructors provide varying instructional strategies suitable for diverse learning styles. However, effective hybrid learning models must be provided to reduce disparities and yield positive student outcomes in online learning (Dorn et al., 2020; Kaden, 2020; Raes et al., 2020a). The findings of this study can be used to identify the impact of hybrid learning models and implications for improving hybrid learning models.

Academically speaking, this study derives significant from helping to bridge a noted gap in the literature. Specifically, there is a lack of understanding of the effectiveness of online classes in hybrid models for elementary students because existent research has tended to focus on colleges (Raes et al., 2020a). There is a debate in the literature as to whether hybrid learning is beneficial (Baum & McPherson, 2019) or detrimental (Dorn et al., 2020; Raes et al., 2020a; Raes et al., 2020b) to students' overall success. This study is positioned within that debate and can contribute to the literature on elementary school hybrid learning by offering evidence from third grade reading in South Carolina.

1.6 Conclusion

In summary, the problem in this study was the low student proficiency of students in third-grade reading courses in South Carolina. To address this problem, the purpose of

the quantitative causal comparative study was to examine the impact that hybrid modality of learning had on third grade reading EOC scores during the 2020-21 school year in public elementary schools in South Carolina. The study answered one central research question: What is the difference in third grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year? This research question was answered using secondary quantitative data and an independent samples *t*-test. The study was based on the theoretical foundation of Piaget's (1954) cognitive constructivism theory of learning. The study has both practical and academic significance.

This chapter, Chapter 1, offered an introduction to and overview of the study. Next, in Chapter 2, the research underlying the topic is reviewed. This review will expound on the problem statement, the background literature, and the theoretical base. Then, in Chapter 3, the research methods by which the proposed study will be conducted are discussed in depth. Chapter 3 will expand on the nature of the study section, addressing data collection and analysis. Once the study is complete, Chapter 4 will contain the results of the data collection and analysis, as well as a description of the sample. Finally, Chapter 5 will conclude the study with a discussion of the results in the context of the existing literature and the specific physical context of the research problem that this study addressed.

CHAPTER 2

REVIEW OF THE LITERATURE

The hybrid modality of instruction gained importance during the COVID-19 pandemic when school districts took aggressive steps to bring the hybrid model into mainstream usage (Dorn et al., 2020; Kaden, 2020). Historically, the hybrid modality of instruction has mainly been applied at the collegiate level (Raes et al., 2020a). Hence, most of the prior research concerning hybrid learning has targeted students and professors involved in undergraduate and postgraduate hybrid learning courses (Raes et al., 2020a). However, additional research is needed to determine the effectiveness of online classes in hybrid learning for elementary students (Raes et al., 2020a) which were implemented largely in response to the COVID-19 pandemic (Shamir-Inbal & Blau, 2021). The purpose of this quantitative study was to examine the impact that the hybrid modality of learning had on third-grade reading EOC scores during the 2020-21 school year in public elementary schools in South Carolina.

2.1 Synopsis

Theoretical support for learning through an online model can be found in Piaget's (1954) cognitive constructivist theory of learning. The theory asserts that individuals generate knowledge and produce meaning from their personal experiences, and then

develop intellectually through that construction of knowledge (Mohammed & Kinyó, 2020; Piaget, 1954). Cognitive constructivist theory has been used as a theoretical foundation in numerous topics in research related to learning (Al-Sakkaf et al., 2019) and across various teaching disciplines (Devi, 2019).

Hybrid learning integrates technological advances and innovation through learning via an online system with interaction and participation from traditional learning models (Sulistiono, 2019). However, there is no consensus in the literature on the definition of hybrid learning as it is often used interchangeably with other terms depicting combinations of teaching modalities that include online learning (McCabe & Francis, 2020; Ghazali, 2022; Halasa et al., 2020; Lopes & Soares, 2018; Ntim et al., 2021). Only a few studies were found that distinguished hybrid learning from other learning modalities that include at least one online interaction (Abi Raad & Odhabi, 2021; Arnett, 2021; Ulla & Perales, 2022). According to Abi Raad and Odhabi (2021), for example, hybrid learning involves teaching in-person and online students simultaneously whereas, in blended learning, in-person and online teaching happen asynchronously.

Several studies that were reviewed for inclusion in this literature review were concerned with comparing the effectiveness of traditional learning with different formats of online learning modalities to determine which most positively influenced learning outcomes and student satisfaction (Nortvig et al., 2018). However, most of the research shows that contextual factors, such as the knowledge and skill of the educator and the quality of the content, also influence learning outcomes and student satisfaction (Nortvig et al., 2018). Hence, much of the research relating to hybrid learning has concentrated on identifying the benefits and challenges of this learning modality (Nortvig et al., 2018).

These studies varied in methodological approaches and populations of interest (Bülow; 2022).

The majority of studies in the existing literature employed qualitative study designs that targeted adult education at the collegiate level (Raes et al., 2020a). Most of these studies sought to identify characteristics of student experiences or technological designs of hybrid learning programs (Raes et al., 2020a). The benefits of hybrid learning included flexibility (Amarin, 2020; Binnewies & Wang, 2019; Bower et al., 2015; Ghazali, 2022; Singh et al., 2021; Wang & Rasmussen, 2020), facilitation of student-centered learning (Ghazali, 2022; Singh et al., 2021; Zydney et al., 2019), space for more students (Bülow, 2022; Ørngreen et al., 2013), increased student autonomy (Flynn-Wilson & Reynolds, 2020; Ghazali, 2022; Ørngreen et al., 2013; Raes et al., 2020a; Shamir-Inbal and Blau, 2021; Singh et al., 2021; Wang & Rasmussen, 2020; Xie & Yang, 2020), and innovative pedagogy (Ghazali, 2022; Green et al., 2020; Liu et al., 2018; Lopes & Soares, 2018; Raes et al., 2020b; Shamir-Inbal & Blau, 2021).

The challenges to hybrid learning modalities included the digital competency of educators (Beatty, 2019; Bülow, 2022; Flynn-Wilson & Reynolds, 2020; Kundu et al., 2021; Ørngreen, 2015; Shamir-Inbal & Blau, 2021; Zydney et al., 2019), the quality and availability of equipment (Bülow, 2022; Flynn-Wilson & Reynolds, 2020; Shamir-Inbal & Blau, 2021), and difficulties communicating during live sessions (Angelone et al., 2020; Shamir-Inbal & Blau, 2021; Zydney et al., 2019). In addition, recent research revealed that hybrid learning posed specific threats to the well-being of both students and teachers. These threats included feelings of isolation and mental exhaustion (Abi Raad & Odhabi, 2021; Bower et al., 2015; Chemi, 2020; Chen et al., 2018; Green et al., 2020;

Rambøll, 2020; Smith et al., 2020; Singh et al., 2021; Wang & Rasmussen, 2020; Yang et al., 2020; Zydney et al., 2020; Zydney et al., 2019).

The majority of studies that investigated the use of technology as a learning medium in elementary schools focused on blended learning modalities – not hybrid learning (Fadhila & Hidayati, 2021; Prescott et al., 2018; Seage & Türegün, 2020). Very few empirical studies relating to hybrid learning were found that focused on young learners. Of these, most studies are centralized to populations in Indonesia (Fadhila & Hidayati, 2021; Handayani & Utami, 2020; Zakaria et al., 2022).

2.2 Organization of the Chapter

This chapter offers a detailed discussion of Piaget's (1954) cognitive constructivist theory of learning that was used to frame the study. In addition, the chosen framework's appropriateness and applicability to the proposed study will be demonstrated. Following, a literature review of relevant studies will be provided progressing from broad subject matter toward the identified gap in the existing literature. These subjects include the evolution of hybrid learning, distinctions between hybrid learning models and blended learning models, the potential benefits and challenges of hybrid learning, and what is currently known about the application of hybrid learning in elementary schools. In addition, this chapter will provide literature-based descriptions of the research variables and a brief review of the literature surrounding the chosen methodology.

2.3 Literature Search Strategy

To uncover the relevant literature, I performed a systematic search of the following electronic databases: JSTOR, Google Scholar, PsycInfo, and PsycArticles. Key search terms included *hybrid learning*, *blended learning*, and *online instruction* entered individually and in combination with *elementary* or *grade*. Additionally, *constructivism*, *cognitive constructivist theory*, and *Piaget* were terms used to research the chosen theoretical foundation. Finally, *third-grade reading scores*, *SC READY ELA assessment*, and *quantitative research methodologies* were explored to provide literature-based descriptions of the dependent and independent variables, as well as literature-based support for the chosen methodology. Articles from the database searches deemed relevant to the proposed study were included in the literature review. 85% of included articles were from 2018 to the present.

2.4 Review of the Literature

The previous section offered a synopsis of research relating to Piaget's (1954) cognitive constructivist theory of learning and the hybrid model of instruction. In addition, the literature search strategy was described. This section will provide a thorough review of the relevant literature in support of the underlying purpose of the current study: to examine the impact that hybrid modality of learning had on third-grade reading EOC scores during the 2020-21 school year in public elementary schools in South Carolina. To begin, this section will offer a comprehensive examination of Piaget's (1954) cognitive constructivist theory of learning that provided the theoretical foundation for the current

study. Further, evidence of the theory's appropriateness as a theoretical foundation and the theory's applicability to the current study will be provided.

2.4.1 Cognitive Constructivist Theory of Learning

In the proposed study, the central tenets of cognitive constructivist theory of learning are applied to an exploration of the use of combined learning modalities to enhance reading and writing achievement. The theory of cognitive constructivism was developed by Swiss psychologist Jean Piaget (Devi, 2019). Piaget was considered the first psychologist to make a systematic review of how children attain knowledge and understanding (Diugnan, 2022).

There are four central tenants to constructivism (Doolittle & Camp, 1999; Stipanovic & Perganits, 2018). First, constructivism is based on the premise that individuals are active participants in learning (Doolittle & Camp, 1999; Ekpenyong, 2018; Piaget, 1954; Sipanovic & Perganits, 2018). Second, learners seek to understand their environments by assigning subjective meaning to their experiences (Creswell & Creswell, 2018; Doolittle & Camp, 1999; Sipanovic & Perganits, 2018). Third, cognitive constructivist theory prioritizes the process of the transformation and organization of knowledge based on the perceptions of the individual (Doolittle & Camp, 1999; Mohammed & Kinyó, 2020). Fourth, knowledge is constructed within biological and neurological systems, as well as through social, cultural, and language interactions (Doolittle & Camp, 1999; Sipanovic & Perganits, 2018). Cognitive constructivist theory acknowledges only the first two tenets of constructivism (Doolittle & Camp, 1999). The cognitive constructivist theory of learning asserts that individuals generate knowledge

and produce meaning from their personal experiences, and then develop intellectually through that construction of knowledge (Piaget, 1954).

Constructivism teachings combine cognitive and social perspectives; Knowledge is individually constructed and socially mediated (Devi, 2019). Cognitive constructivism describes the development of cognitive abilities while social constructivism emphasizes the context in which learning is achieved (Valdez et al., 2022). Ekpenyong (2018) explained that cognitive constructivists purport that individuals make sense of new information based on pre-conceived beliefs and self-identity. In contrast, social constructivists believe knowledge is gained through social interactions, debate, and with the help of mentors (Ekpenyong, 2018). Doolittle and Camp (1999) described the difference between cognitive constructivists and social constructivists thus: "Cognitive constructivists emphasize accurate mental constructions of reality...Social constructivists emphasize the construction of an agreed-upon, socially constructed reality" (p. 8).

A basic assumption of constructivism is that learning occurs within real-world tasks (Doolittle & Camp, 1999; Ekpenyong, 2018). Reflection on these tasks allows the learner to change existing beliefs, discard previous assumptions, or assimilate new information (Ekpenyong, 2018). In addition, constructivist pedagogy should involve social negotiation and mediation (Doolittle & Camp, 1999). From the cognitive constructivist perspective, social negotiation and mediation are necessary for the development of socially relevant skills and knowledge (Doolittle & Camp, 1999).

Piaget (1954) introduced the learning process through the concept of schemata. Schemata are the mental structures by which individuals adapt to and explain their environments (Yüksel, 2020). Similar to children's building blocks, learning is scaffolded

through assimilation and accommodation (Yüksel, 2020). Assimilation occurs when new concepts are integrated into existing schemata (Schiarnberg, 1985). Accommodation, however, occurs when the introduction of new information results in the modification of existing schemata or develops entirely new schemata (Schiarnberg, 1985). In this way, children gain an understanding of new information by alternating back and forth between assimilation and accommodation (Devi, 2019).

2.4.2 Cognitive Constructivist Appropriateness as a Theoretical Foundation

Cognitive constructivist theory has been applied to numerous topics in research related to learning (Al-Sakkaf et al., 2019). A systematic review of the literature conducted by Al-Sakkaf et al. (2019), revealed that constructivism was the dominant theoretical framework applied to computing education research. The theory has also led to significant empirical findings concerning learning, memory, and cognition (Doolittle & Camp, 1999). Schema theory, working memory models, computational models of learning and memory, and neurological models of brain function have all emerged from studies that relied on cognitive constructivist frameworks (Doolittle & Camp, 1999). Further, successful instructional applications, such as concept maps, elaborative practice, reading strategies, and problem-solving strategies resulted from theoretical advances that benefited from cognitive constructivist theory (Doolittle & Camp, 1999). These examples demonstrate that the cognitive constructivist theory is an appropriate theoretical foundation for research across numerous fields of study.

In addition, constructivism has been applied across various teaching disciplines (Devi, 2019). Doolittle and Camp (1999) championed cognitive constructivism as the

theory that was most compatible with career and technical education. Devi (2019, p. 8) described constructivist learning in education as a "student-driven process in which students develop or construct their understanding of information." The teacher takes on the role of a guide by offering guidance, asking questions, and explaining concepts to the students rather than disseminating information (Devi, 2019).

Devi's (2019) understanding of constructivism reflects the foundational aspects of a flipped classroom learning model. The flipped classroom, as described by Hidayah and Mustadi (2021), is a learning model in which students learn content at home using online tools and conduct inquiry and investigation at school. The flipped classroom provides an environment in which students can spend more time applying and practicing newly learned concepts in school with the guidance of their teacher (Jackson, 2019). In addition, the flipped classroom encourages increased interactions between teachers and students which have been shown to improve student motivation, engagement, satisfaction, and performance (Lopes & Soares, 2018).

A study by Xu and Shi (2018) applied constructivist learning theory to the learning modality of the flipped classroom. Their findings concurred with Hidayah and Mustadi's (2021) description of the flipped classroom; students in a flipped classroom are active participants in their education while teachers take on a supportive role to cultivate students' learning independence (Xu & Shi, 2018). Based on these examples, the cognitive constructivist theory of learning is also an appropriate theoretical foundation for education research.

2.4.3 Cognitive Constructivist Theory's Applicability to the Current Study

Many studies examining educational technology are under-theorized (Schad et al., 2021). However, Sommerauer and Müller (2018) found that 78 percent of the articles related to augmented reality for teaching and learning that were included in their literature review relied on constructivist learning theories. However, Schad et al. (2021) argued that many studies offer only vague references to foundational theories that do not support the conceptualization of research in collecting and analyzing data. The following examples demonstrate that cognitive constructivist theory (Piaget, 1954) applies to the current study.

Valdez et al. (2022) conducted a phenomenological study to ascertain details from teachers' lived experiences of learning to deliver lessons using an online platform during the COVID-19 pandemic. The researchers employed Piaget's (1954) cognitive constructivist theory of learning to examine the process of construction, deconstruction, and reconstruction in learning the process of teachers who were navigating the abrupt transition from a traditional classroom environment to an entirely online instruction modality. The findings revealed that teachers were able to improve and innovate through the process of teaching online (Valdez et al., 2022). An analysis of the data viewed through the lens of cognitive constructivist theory revealed that teachers demonstrated aspects of cognitive constructivism including practice, sharing, and reflection to gain competency in delivering lessons online (Valdez et al., 2022). This study demonstrates that the cognitive constructivism theory of learning applies to learning using an online modality.

Jung and Wong (2018) found Piaget's (1954) cognitive constructivist theory of learning to be one of two dominant theoretical frameworks applied to the research of robotics education for young children. However, Jung and Wong (2018) cautioned that existing studies relying on constructivism as a pedagogical foundation were limited by technological determinism, meaning, technology was attributed with being the causal influence of student learning-not teaching methods. The researchers argued that a shift in focus from technology to pedagogy was to investigate young children's agency to adapt to technology, teaching methods, and curricula rather than a focus on the robotics technology itself (Jung & Wong, 2018). This warning is particularly relevant to the current study as research into the impact that hybrid modality of learning had on third-grade reading EOC scores during the 2020-21 school year in public elementary schools in South Carolina is conducted. Applying Piaget's (1954) cognitive constructivism theory of learning as the theoretical foundation of the current study will frame the research in such a way as to keep the focus on how students learn rather than the tools they use to gain knowledge.

2.4.4 Evolution of Hybrid Learning

Before the COVID-19 pandemic, the majority of teaching took place in traditional brick-and-mortar classrooms using a face-to-face format where both teachers and students were present at the same time (Jones, 2019; Nortvig et al., 2018) Traditional instruction operates on the assumption that effective learning is possible for all students who attend school at the same times and participate in the same lessons at an equal pace to their classmates (Arnett, 2021). There are numerous benefits to traditional learning.

These benefits include the opportunity to ask questions and receive responses in real-time (Paul & Jefferson, 2019), organic bonding between students and faculty (Roval & Jordan, 2004), and the opportunity for teachers to read non-verbal cues allowing them to make adjustments as needed (Paul & Jefferson, 2019). However, traditional instruction does not take into account differences in background knowledge, diverse cultural and linguistic identities, socioeconomic status, parent education levels, personality traits, natural aptitudes, interests, developmental challenges, and past trauma (Arnett, 2021).

Asynchronous learning, where students can complete their course work online at their own pace without being physically present in a classroom, emerged in the mid-1990s at the collegiate level as a result of technological advances and the internet (Ghazali, 2022; Jones, 2019; Nortvig et al., 2018). The adoption of online learning in K-12 schools has developed gradually over the last two decades (Arnett, 2021). However, the sudden onset of the COVID-19 pandemic in 2020 caused an abrupt acceleration and widespread implementation of online learning in grades K through 12 (Arnett, 2021).

Online learning refers to teaching that is conducted through the use of digital technology typically involving the internet or web-based platforms, mobile devices, or video conferencing (Ghazali, 2022; Jones, 2019). Technology provides the infrastructure, tools, and resources that facilitate the online learning experience (Ntim et al., 2021). Education institutions have explored various learning environments including electronic books, simulations, podcasts, blogs, and vlogs (Jones, 2019; Ntim et al, 2021). Online learning is multi-faceted and continues to evolve as more research is conducted in educational technology, educational psychology, and learning sciences. The flexibility of

place and time, convenience, and adaptability to different learning styles were among the benefits associated with early online learning (Ghazali, 2022).

The economic advantages associated with online learning have inspired academic administrators to increase the variety of online course offerings (Jones, 2019). However, passive learning typically associated with early adaptations of online learning did not yield effective academic results (Jones, 2019). Consequently, the advent of online learning brought forth several non-traditional learning models that included blended and hybrid learning (Jones, 2019).

The terms blended learning and hybrid learning are often used interchangeably in the literature to mean any teaching modality that includes virtual learning, online learning, or mobile learning (Ghazali, 2022; McCabe & Francis, 2020; Ntim et al., 2021). However, some studies were found that distinguished hybrid learning from other teaching modalities. Abi Raad and Odhabi (2021), for instance, distinguished hybrid learning from blended learning based on synchronicity. According to the researchers, " Hybrid learning involves the simultaneous application of in-person and remote instruction, while blended learning is the asynchronous application of both" (Abi Raad & Odhabi, 2021, p. 4). Ulla and Perales (2022) agreed with this assessment. Their definition of hybrid learning stated that " hybrid teaching is synchronous teaching of students in the classroom and online using an online platform" (Ulla & Perales, 2022, p. 2).

Arnett (2021) further separated the terms blended and hybrid learning when used within the context of teaching during the COVID-19 pandemic. Synchronous hybrid instructional arrangements used during the pandemic were primarily used to transmit traditional classroom instruction via the internet and offered none of the benefits

previously associated with blended learning (Arnett, 2021). However, survey data revealed that both teachers and administrators planned to use online learning more than they did before the pandemic (Arnett, 2021). The following sub-sections will further distinguish blended learning from hybrid learning by offering examples and details of both learning modalities.

2.4.5 Blended Learning

Blended learning combines aspects of both traditional and online formats (Banat, 2020; Kayalar & Kayalar, 2021). Dziuban et al. (as cited in Singh et al., 2021) defined blended learning as follows:

Blended learning...is an instructional method that includes the efficiency and socialization opportunities of the traditional face-to-face classroom with the digitally enhanced learning possibilities of the online mode of delivery (p. 141).

Prescott et al. (2018) noted that blended learning can take various forms, thus allowing users to adapt a program that best fits their pedagogical goals and physical setting. This benefit was echoed by Nortvig et al. (2018) who found blended learning offered students the flexibility to learn where and when they wanted. The benefit of flexibility was further underscored by Binnewies and Wang (2019) who claimed that blended learning offered students greater control of their learning strategies.

Singh et al. (2021) identified three primary characteristics of the blended learning approach. First, a blended learning approach follows a student-centered teaching model where every student must be actively engaged in learning. Second, blended learning offers increased opportunities for interactions between students and faculty, students and

peers, students with content, and students with supplemental learning material. Third, blended learning provides opportunities to gather formative and summative assessments to improve course offerings (Singh et al., 2021). These characteristics demonstrate the key tenets of the cognitive constructivist theory that students take an active role in learning and use reflection to assimilate or accommodate new information (Piaget, 1954).

In a typical blended learning modality, the discussion takes place online and in face-to-face interactions (Jones, 2019). Learning material is disseminated to the students via forums such as Facebook, blogs, Wiki, or a Learning Management System (Jones, 2019). A recent study by Taufik et al. (2022) examined the application of YouTube-based virtual blended learning as a learning modality during the COVID-19 pandemic. The researchers found that virtual learning through YouTube had a significant positive impact on students' fundamental learning skills (Taufik et al., 2022).

Blended learning has been applied across teaching disciplines including science, technology, engineering, mathematics, physical education, and reading (Kundu et al., 2021; Marcuso et al., 2020; Schechter et al., 2015; Seage & Türegün, 2020; Taufik et al., 2022). As a recent example of a literacy-based study, Marcuso et al. (2020) evaluated the effects of blended learning in kindergarten through fifth-grade students during the 2016-2017 school year. Compared to students in schools learning by traditional instruction methods, the students in the treatment schools demonstrated greater gains on reading tests (Marcuso et al., 2020). This study demonstrates the viability of using a blended learning modality for reading instruction in elementary school (Marcuso et al., 2020). The results reported by Marcuso et al. (2020) were supported by Rambøll, et al. (2020) who found elementary students' reading comprehension scores improved as a result of blended

learning modalities. Further, the students appeared to be happy and enthusiastic when engaged in blended learning activities (Rambøll, et al., 2020).

One example of a blended learning program is the Lexia Reading Core5. The program integrates online activities, ongoing assessment to guide instruction, and targeted resources for teacher-led instruction, as well as independent offline work (Schechter et al., 2020). Lexia Reading Core5 specifically addresses literacy-based skills that include phonemic awareness, phonics, fluency, vocabulary, language acquisition, comprehension, and writing to teach English language arts to students in kindergarten through fifth grade. In addition, the program teaches other essential 21st-century skills such as communication and collaboration. Core5 includes an online program along with integrated teacher-led Lexia Lessons and paper and pencil independent, student-led activities as appropriate (Schechter et al., 2020).

The efficacy of the Lexia Reading Core5 was demonstrated by Kazakoff et al. (2018). The researchers examined the reading development of kindergarten through fifth-grade students enrolled in the Lexia Reading Core5 program. The results indicated students' reading skills improved significantly over the first year based on standardized test results (Kazakoff et al., 2018). The researchers concluded the Lexia Reading Core5 was an effective tool for use with at-risk students because of the ability of the program to accurately and efficiently differentiate instruction when faced with students who present diverse profiles and skills (Kazakoff et al., 2018).

2.4.6 Hybrid Learning Model

The hybrid learning model integrates technological advances and innovation through learning with an online system with interaction and participation from traditional learning models (Sulistiono, 2019). Online interactions in a hybrid medium of instruction can be completed either synchronously using real-time meeting sessions or asynchronously where students interact at different times (Siegelman, 2019). Synchronous learning enables social activities that simulate regular class lessons and may include discussions, whole-class activities, and peer feedback (Shamir-Inbal & Blau, 2021). Asynchronous learning tasks aim to promote individual student learning (Shamir-Inbal & Blau, 2021). Singh et al. (2021) identified four types of hybrid learning models: rotation, flex, a la carte, and enriched virtual education.

2.4.6.1 Rotational Learning Model

In the rotation model, students move through different modalities of learning based on a fixed schedule or when the instructor deems it appropriate (Ghazali, 2022; Lopes & Soares; Singh et al., 2021; Wang et al., 2021). Students can rotate from a traditional classroom to a computer lab or to working online from home (Singh et al., 2021). Learning stations may include direct instruction from the teacher, small group or whole class activities, group projects, and individual tutoring or assignments (Ayob et al., 2020). The inclusion of online learning is what makes the rotational learning model a sub-category of blended learning (Ayob et al, 2020; Wang et al., 2021).

There are four specific types of rotational learning: station rotation, lab rotation, the flipped classroom model, and the individual rotation model (Ayob et al., 2020; Dakhi

et al., 2020; Kayalar & Kayalar, 2021). In station rotation, students rotate to different stations within one classroom where at least one station is an online learning method (Ayob et al., 2020; Dakhi et al., 2020; Ghazali, 2022; Lopes & Soares, 2018). Rotation through each station is not optional for learners engaged in this modality (Ghazali, 2022). Station rotation is most commonly implemented in elementary schools (Lopes & Soares, 2018) and was reportedly the most widely used model pre-pandemic (Arnett, 2021).

Lab rotation involves students rotating among different locations within a school where at least one station is a computer lab (Ayob et al., 2020; Dakhi et al., 2020; Lopes & Soares, 2018). Lab rotation allows schools to make use of existing computer labs and coordinate teacher schedules (Lopes & Soares, 2018). In addition, lab rotation offers students the opportunity to apply and reinforce what they have learned in class (Ghazali, 2022). This modality requires the least instructor interaction (Ghazali, 2022).

The flipped classroom concept is a sub-model of rotational learning in which students learn content at home and apply the knowledge to coursework, inquiry, and investigation in school (Ayob et al., 2020; Ghazali, 2022; Hidayah & Mustadi, 2021; Lopes & Soares, 2018). At-home learning consists of video lectures, readings, homework, or supplemental videos (Lopes & Soares, 2018). In-class activities, such as role-play, debates, quizzes, and group presentations allow the student to practice the knowledge learned at home (Lopes & Soares, 2018). A benefit of the flipped classroom is that it allows students to learn at their own pace (Lopes & Soares, 2018). However, the flipped classroom model also represented an initial increase in workload for teachers who had to spend time in course preparation to find or create online content or come up with in-class learning activities (Lopes & Soares, 2018).

In a survey conducted by Arnett (2021), the flipped classroom model was the most popular learning modality among educators during the pandemic. Those surveyed viewed the flipped classroom model as a way to support absent students, tailor instruction to fit student needs and circumstances, and allow more time in class to focus on giving students individualized support (Arnett (2021). Most of the teachers surveyed plan to continue utilizing the flipped classroom model post-pandemic (Arnett, 2021).

The individual rotation model involves teachers assigning individual rotations to students based on their learning needs (Ayob et al., 2020; Ghazali, 2022). Students do not rotate among every available station or modality (Ayob et al., 2020; Lopes & Soares, 2018). Instead, students follow unique educational pathways to learn content through individual study, small homogenous groups, collaboration, or individualized interventions designed by the teacher (Ghazali, 2022). In a typical rotational learning model, students rotate within a classroom or set of classrooms (Ayob et al., 2020).

The rotational model has been applied to students of all grade levels and across academic disciplines (Ayob et al., 2020). Prior research revealed that the rotational learning model has a positive effect on learning and contributed to gains in mean test scores (Ayob et al., 2020). Possible explanations of the efficacy of the rotational learning model included an enhanced learning experience and direct feedback from the teacher (Ayob et al., 2020). It should be noted that the rotational model has also been categorized as a form of blended learning by Abi Raad and Odhabi (2021) and Arnett (2021).

The rotational model was applied to emergency teaching during the COVID-19 pandemic with important differences. Most schools implemented a rotational schedule where students came to school for in-person instruction on alternating times, days, or

weeks while others participated remotely (Arnett, 2021). Teachers reported difficulties maintaining remote student engagement using this synchronous hybrid learning modality as students failed to participate or did not turn on their cameras (Arnett, 2021).

2.4.6.2 Flex Model

In the flex model, online learning is central to the student's education (Ayob et al., 2020; Lopes & Soares, 2018; Singh et al., 2021). Content and instruction are fully delivered via online learning (Ayob et al., 2020; Dakhi et al., 2020; Wang et al., 2021). Students navigate course material independently and at their own pace (Dakhi et al., 2020; Ghazali, 2022). Students are offered the flexibility to seek in-person support as needed but are not required to physically be in a classroom unless they choose to (Ayob et al., 2020; Ghazali, 2022; Lopes & Soares, 2018; Singh et al., 2021). In the flex model, teachers serve as mentors or guides who remain available to students if individual tutoring is needed (Ayob et al., 2020; Lopes & Soares, 2018). According to Wang et al. (2021), the flex model adjusts to individual students' learning styles, offers flexibility that increases teaching resources, and strengthens teachers' team flexibility. The flex model offers individuals a high level of control over their education (Lopes & Soares, 2018).

HyFlex is a flex model developed by Beatty (2019) in response to a need to serve both online and traditionally instructed students. HyFlex courses offer students the flexibility to attend classes online or in person, synchronously or asynchronously (Beatty, 2019). A benefit of the HyFlex course design includes increased access to courses when attending in person is problematic or when desired course schedules are conflicting (Beatty, 2019). In addition, HyFlex offers more learning resources to students and

enables teachers to serve more students with the same number of resources (Beatty, 2019).

2.4.6.3 A La Carte

The a la carte model allows the student to choose either online or onsite classes or a combination of both depending on the student's interests or needs (Ghazali, 2022; Kayalar & Kayalar, 2021; Singh et al., 2021). Also referred to as self-blend (Chukwuemeka et al., 2020; Lopes & Soares, 2018), this model offers flexibility for students who wish to supplement their learning with online courses that may not be offered in the traditional school environment (Dakhi et al., 2020; Ghazali, 2022; Wang et al., 2021). A la carte models are typically found in high schools to offer students advanced placement or elective courses that would not otherwise be a part of the school's curriculum (Lopes & Soares, 2018). According to Kayalar and Kayalar (2021), a la carte models support student-centered learning, develop student self-management skills, and personalize learning.

2.4.6.4 Enriched Virtual Model

The enriched virtual model includes courses in which students are required to complete in-person sessions and then learn course content and instruction alone via an online modality (Ayob et al., 2020; Kayalar & Kayalar, 2021; Lopes & Soares, 2018; Singh et al., 2021). The in-person sessions typically are reserved for group-based work or teacher-led instruction meant to enhance students' learning experiences (Kayalar & Kayalar, 2021). Additionally, face-to-face interactions hold students accountable via

regular check-ins with instructors (Kayalar & Kayalar, 2021). The enriched virtual model differs from the flipped classroom because students in the enriched virtual model are only required to attend school in person on designated days (Kayalar & Kayalar, 2021). Unlike the a la carte model where online and face-to-face modalities vary by course, the enriched virtual model combines online and offline experiences across courses offering a whole-school experience (Kayalar & Kayalar, 2021).

2.4.7 Potential Benefits of Hybrid Learning

Numerous studies have examined the potential benefits of hybrid learning using both qualitative and quantitative methods. A review of the research from 2018-2022 confirms earlier research; hybrid learning entails many significant benefits. Some of the benefits explored by prior research have included positive financial benefits for students and institutions; Students save money from reduced costs associated with commuting while institutions experience cost savings from reduced building upkeep and maintenance (Ghazali, 2022). Other studies have noted an increase in student self-efficacy (Singh et al., 2021) and in student motivation to learn (Magnus et al., 2020) when compared to traditional teaching.

Even more research explored relationships within the hybrid learning environment. Prior research indicated that technology levels out asymmetrical relations (Cook et al., 2020; Konnerup et al., 2019). In other words, digital platforms provide individuals of diverse social and economic backgrounds with opportunities to connect on an equal basis (Cook et al. 2020). Educators reported that the collective experience of facilitating emergency remote teaching during the COVID-19 pandemic improved intra-

school coordination and strengthened digital school culture (Shamir-Inbal & Blau, 2021). Yet another study revealed teachers perceived classroom management was easier because hybrid learning reduced bullying (Arnett, 2021). +Several other benefits, including flexibility, facilitation of student-centered learning, space for more students, increased student autonomy, and innovative pedagogy, will be explored in greater detail in the following sub-sections.

2.4.7.1 Flexibility

To begin, flexibility was touted by many researchers as a benefit of hybrid learning. Binnewies and Wang (2019), for example, examined the teaching components of a HyFlex course taken by second-year undergraduate students using a mixed-methods study design. Qualitative and quantitative feedback provided by students indicated the flexibility offered by the HyFlex course was appreciated by students in that the students experienced greater control over their learning strategies (Binnewies & Wang, et al. 2019). Ghazali (2022) reported that hybrid learning freed students and teachers from the constraints of the time and place of traditional learning methods which created flexibility around the frequency and methods of communication.

Bower et al. (2015) conducted a cross-case analysis of blended synchronous learning environments. The researchers proclaimed that hybrid learning offered pedagogical flexibility because teachers could choose the method that best suited the needs of their students. Hence, pedagogical flexibility facilitated the dissemination of course content. In addition, the students perceived greater access to learning due to the flexibility that the online modality created (Bower et al., 2015). The students appreciated

that they could attend live classes from other locations if they were unable to attend in person due to illness or other time commitments (Bower et al., 2015).

Bower et al.'s (2015) findings were confirmed by subsequent research. Hybrid learning models were found to offer flexible learning environments and the increased possibility of participating as a distance student in cases of illness, quarantine, or physical or mental disability (Singh et al., 2021; Wang & Rasmussen, 2020). Amarin (2020) discovered a decline in the dropout rates of students enrolled in hybrid learning modalities as access to teaching became easier for students living in remote areas.

2.4.7.2 Facilitates Student-centered Learning

In addition to offering students more flexibility, the hybrid learning approach was also found to promote student-centered learning (Arnett, 2021; Zydney et al., 2019). Prior research has shown that hybrid learning modalities encourage more student ownership of their learning environment (Ghazali, 2022; Singh et al., 2021; Zydney et al., 2019). An exploratory study conducted by Zydney et al. (2020) used a design-based research methodology to create, test, and assess a blended synchronous learning environment. Roles within the classroom were distributed based on student interests. The researchers found students took on greater leadership roles through facilitating program protocols (Zydney et al., 2020).

2.4.7.3 Space for More Students

The implementation of hybrid learning programs also has the potential to create more physical space for students (Bülow, 2022). Allowing students to learn from home or

elsewhere results in fewer students on campus at the same time. This creates a safer learning environment amidst the COVID-19 pandemic in that fewer students on campus allows for more physical space between students (Bülow, 2022). In addition, hybrid learning has the potential advantage of allowing an increase in student enrollment as institutions can accommodate more people due to the lack of physical constraints (Ørngreen et al., 2013).

2.4.7.4 Increased Student Autonomy

Prior research has shown that students enrolled in hybrid learning develop greater autonomy and self-organization skills (Flynn-Wilson & Reynolds, 2020; Ørngreen et al., 2013; Raes et al., 2020a; Singh et al., 2021; Wang & Rasmussen, 2020). A study conducted by Shamir-Inbal and Blau (2021) revealed that teachers adapted their roles to include assisting students with becoming self-regulated learners over the course of the COVID-19 pandemic shutdown. Autonomous learning has been shown to improve student learning outcomes, promote self-discipline, and cultivate life-long learning skills (Ghazali, 2022; Xie & Yang, 2020). In addition, hybrid learning environments facilitate student monitoring of their own academic progress (Ghazali, 2022). Digital platforms allow students to view feedback from instructors and track grades throughout their coursework (Ghazali, 2022).

2.4.7.5 Innovative Pedagogy

Before the COVID-19 pandemic, online lessons were unnecessary and represented time-demanding redundancy for most teachers (Arnett, 2021). Once teachers

were forced online, they discovered tools with the potential to make lessons more engaging (Arnett, 2021). In a hybrid learning environment, teachers design their own learning activities that can be tailored to capture students' attention and activate engagement (Ghazali, 2022; Green et al., 2020; Shamir-Inbal & Blau, 2021). In addition, hybrid learning offers the possibility of involving external experts and the inclusion of students' own resources (Liu et al., 2018; Raes et al., 2020b). Teachers can also apply alternative evaluation and assessment methods (Ghazali, 2022). Learning analytics collect student results and provide comprehensive reports on academic achievement (Ghazali, 2022). In flipped classroom models, online formative assessments can provide students with immediate feedback to better prepare them for in-class activities (Lopes & Soares, 2018).

Shamir-Inbal and Blau (2021) reported that teachers preferred to design their own learning content not only to meet individual student needs but to free themselves from routine and foster creativity. The researcher analyzed nationwide samples from 133 elementary and secondary school teachers in Israel who facilitated emergency remote teaching during the COVID-19 pandemic (Shamir-Inbal & Blau, 2021). The participants of the study perceived an increase in personal empowerment that stemmed from feelings of accomplishment and professional success as they navigated synchronous and asynchronous learning (Shamir-Inbal & Blau, 2021). The experience of adapting to emergency remote teaching provided educators with an opportunity for personal and professional growth (Shamir-Inbal & Blau, 2021).

This section identified numerous benefits of hybrid learning models found in the literature. Flexibility, facilitation of student-centered learning, space for more students,

increased student autonomy, and innovative pedagogy were identified as the potential benefits of hybrid learning by multiple sources. However, the hybrid learning model is not without challenges. In the following section, a discussion of the challenges associated with hybrid learning that have been identified in prior research will be detailed.

2.4.8 Challenges of Hybrid Learning

Despite the numerous benefits of hybrid learning, recent research has shown that some students prefer traditional classroom course delivery over hybrid or wholly online learning formats as they found traditional classes more engaging and interactive (Clayton et al., 2018). In addition, Arnett (2021) reported that the majority of teachers of synchronous hybrid learning modalities during the 2020-2021 school year surveyed perceived that their students were behind learning benchmarks. However, these outcomes varied based on circumstances and individual learning preferences (Arnett, 2021).

The literature review also showed that the numerous benefits of hybrid learning are challenged by the digital competency of educators (Beatty, 2019; Bülow, 2022; Flynn-Wilson & Reynolds, 2020; Kundu et al., 2021; Ørngreen, 2015; Shamir-Inbal & Blau, 2021; Ulla & Perales, 2022; Zydney et al., 2019), the quality and availability of equipment (Bülow, 2022; Flynn-Wilson & Reynolds, 2020; Shamir-Inbal & Blau, 2021), and difficulties communicating during live sessions (Angelone et al., 2020; Shamir-Inbal & Blau, 2021; Zydney et al., 2019). In addition, recent research revealed that hybrid learning posed specific threats to the well-being of both students and teachers. These threats included feelings of isolation and mental exhaustion (Abi Raad & Odhabi, 2021; Bower et al., 2015; Chemi, 2020; Chen et al., 2018; Green et al., 2020; Rambøll, 2020;

Smith et al., 2020; Singh et al., 2021; Wang & Rasmussen, 2020; Yang et al., 2020; Zydney et al., 2020; Zydney et al., 2019). This section offers a detailed discussion of these challenges as reported in prior research.

2.4.8.1 Digital Competency

In a hybrid learning environment, teachers are required to facilitate and coordinate the use of different technologies while simultaneously instructing students who are in person or online (Beatty, 2019; Ørngreen, 2015). Tasks associated with a hybrid learning program, other than preparing lesson plans and disseminating information to students, include setting up and utilizing projectors, webcams, speakerphones, or web conferencing tools and handling troubleshooting (Ulla & Perales, 2022; Zydney et al., 2019). These tasks are comparatively more demanding than facilitating a traditional classroom (Zydney et al., 2019) and can be overwhelming to some educators (Shamir-Inbal & Blau, 2021). Virtual synchronous learning classes with more students, larger classrooms, and additional equipment often require additional support (Zydney et al., 2019).

The quality of teaching in a hybrid learning environment is dependent on the digital competency and digital literacy of teachers and students (Bülow, 2022; Kundu et al., 2021; Ulla & Perales, 2022). Technology requires instruction and habituation to maximize its usefulness (Flynn-Wilson & Reynolds, 2020). Teachers may not receive adequate training (Shamir-Inbal & Blau, 2021) or lack the multi-tasking skills (Zydney et al., 2019) required to effectively use digital platforms while instructing students. A case study by Ulla and Perales (2022) highlighted that hybrid teaching requires teachers to not only have strong pedagogical but experience with online platforms.

Furthermore, student engagement was impacted by the teacher's technological skills (Flynn-Wilson & Reynolds, 2020); Technical problems increased when adjunct faculty unfamiliar with the equipment or digital platforms taught a virtual synchronous course in place of full-time faculty. A study by Flynn-Wilson and Reynolds (2020) demonstrated that student proficiency in technology also impacted the learning experience. The study revealed that students gained confidence and became more comfortable using the technology in virtual synchronous learning with each new course in which they enrolled. In addition, the researchers found that students' perceptions of participation in discussions and the quality of discussions became more positive with each additional enrollment in a virtual synchronous learning course (Flynn-Wilson & Reynolds, 2020).

2.4.8.2 Equipment Quality and Availability

Another drawback of hybrid learning is that hardware is susceptible to technical issues that may result in downtimes or connectivity problems (Abi Raad & Odhabi, 2021). Problems with audio/visual equipment may interfere with a student's ability to see and hear, potentially having a negative impact on the overall learning experience (Zydney et al., 2019). The software can also impact the quality and effect of hybrid learning (Zydney et al., 2019). Web conferencing platforms impact the ease of participation and availability of features, such as whiteboards or closed captioning (Zydney et al., 2019). In a study conducted by Flynn-Wilson and Reynolds (2020), students perceived technology issues were a major obstacle that impeded learning. The students reported lagging internet connections, microphone malfunctions, and student-end equipment problems

were barriers to virtual synchronous learning (Flynn-Wilson & Reynolds). These findings were supported by research from Valdez et al. (2022) who reported that connectivity issues were most often the impetus for student engagement.

Additionally, the availability of equipment is necessary to facilitate hybrid learning (Ulla & Perales, 2022). Many institutions lack the infrastructure and technology staff to support hybrid learning (Singh et al., 2021). According to Ulla and Perales (2022), each hybrid classroom should be equipped with a multimedia projector, a computer connected to the internet, a web camera, a microphone, and an online meeting platform.

Additionally, students may not have access to the technology that would allow them to participate in hybrid learning (Dakhi et al., 2020; Singh et al., 2021). Singh et al. (2021) referred to the inaccessibility to technology as the *digital divide* that impedes student learning. Singh et al.'s conclusion was supported by Shamir-Inbar and Blau (2021); Participants in their study reported that, in some homes, one computer had to meet the needs of both students and their parents who were working from home. Moreover, students quickly become disinterested if they do not have access to the necessary equipment (Dakhi et al., 2020).

2.4.8.3 Difficulties in Communicating

Dakhi et al. (2020) cautioned that one of the most significant drawbacks of online learning is the lack of interaction between teachers and students. Face-to-face interactions were found to be a more natural and effective mode of communication compared with internet-based discussions (Yang et al., 2020). Several studies noted difficulties in

communicating within hybrid learning courses. The majority of studies found identified challenges with interpersonal communication during virtual synchronous learning. Difficulties with interpersonal communication were attributed to technological challenges and poor student attendance during live sessions (Shamir-Inbal & Blau, 2021).

Zydney et al. (2020), in particular, noted several interpersonal communication challenges related to technology. For instance, the loss of visual and audible cues from students created a disadvantage for teachers. The need for physical connection was echoed by participants in an exploratory study by Angelone et al. (2020); Face-to-face discussions facilitated learning when students could read each other's body language (Angelone et al., 2020).

In addition, the audio component of virtual synchronous learning was particularly important to student success (Bower et al., 2015). Poor audio/visual quality and framing of the instructor inhibited student participation (Bell et al., 2014; Zydney et al., 2020). The remaining conscience of camera positioning and speaking into a microphone interrupted the conversational flow of discussion (Bower et al., 2015; Zydney et al., 2019).

Distractions were also a factor that impeded communication. Multiple communication channels were found to take student focus away from the content of the discussion. Also, students were sometimes participating in discussions in an environment that caused a distraction (Zydney et al., 2020). As an example, a participant in Zydney et al.'s (2020) study shared their perception that a student joining a virtual synchronous discussion from an airport created a distraction making it hard for other students to fully engage. Background noise and audio feedback were frequently cited as a distraction or

impetus to a conversation (Angelone et al., 2020). In working with K-12 students during emergency remote teaching, educators reported that students often would not join the class *Zoom* meetings or would disappear from the screen (Samir-Inbal & Blau, 2021).

A study by Angelone et al. (2020) revealed several timing and communication issues. Troubleshooting required teachers to remove themselves from discussions or entirely stop presentations (Angelone et al., 2020). Communication was also dependent on instructors' ability to multitask. In one iteration of Angelone et al.'s (2020) exploratory study, the instructor failed to monitor the online chat and missed questions from students who were having difficulty.

Group size was another crucial consideration when designing for learning (Zydney et al., 2019). Chen et al. (2017) noted that large group classes posed a threat to focused and effective communication during online discussions. Synchronous discussions were sometimes characterized by awkward silences, students speaking over one another, and students interrupting one another (Szeto, 2014). In addition, Angelone et al. (2020) reported that teachers had difficulty communicating with the whole group during the breakout session.

2.4.8.4 Perceived Isolation

In addition to the challenges of hybrid learning associated with technical proficiency, quality, accessibility, and communication, students who participated remotely often felt ignored or neglected (Yang et al., 2020). Smith et al. (2020) noted that teachers may ignore or forget about online students in favor of face-to-face students when leading synchronous hybrid learning if the teacher is not on a digital meeting platform

themselves. Abi Raad and Odhabi (2021) concluded that the physical separation of students and teachers led to perceived isolation by both parties. Perceived isolation was a challenge to hybrid learning reported by several researchers and has been associated with lower student outcomes (Nortvig et al., 2018). Absenteeism and disengagement with course materials due to perceived isolation were noted as potential reasons for lower success rates among hybrid learners (Nortvig et al., 2018).

Rambøll (2020) found remote learners experienced a sense of detachment and reported difficulties in establishing cooperation with other students across learning spaces. Wang and Rasmussen (2020) noted that online learners in virtual synchronous environments often became spectators instead of participants and co-designers of the learning space. This was sometimes attributed to technical issues or the instructor's inattentiveness to online participants (Angelone et al., 2020; Smith et al., 2020; Singh et al., 2021). However, Butz and Stupnisky (2016) reported that online synchronous hybrid students experienced significantly lower levels of peer relatedness than their on-campus counterparts.

Bower et al. (2015) called for strategies to improve co-presence. Co-presence is the sense of community and rapport shared amongst students of hybrid learning courses whether physically present in a classroom or participating via technology (Bower et al., 2015). Angelone et al. (2020) reported that on-campus students who participated in their study perceived online students as outsiders or a distraction. The researchers recommended that hybrid learning designs incorporate visual connections and inclusive language to enhance co-presence (Angelone et al., 2020).

2.4.8.5 Educator Well-Being

Hybrid learning also poses challenges to the mental and physical well-being of instructors who lead these programs. Some educators who have contributed to prior research studies described feeling mentally exhausted after facilitating and coordinating the use of digital platforms while also leading course instruction (Arnett, 2021; Chemi, 2020; Ørngreen, 2015). One teacher surveyed by Arnett (2021) described the experience as doing "two jobs at the same time" (p. 7) while another experienced a lack of energy extolled from the amount of effort required to teach synchronous hybrid learning day to day. Still, others described synchronous hybrid learning arrangements as unsustainable at the elementary school level due to the workload that one teacher described as "doubled" (p. 11).

Bülow (2022) attributed the mental exhaustion that educators experience after facilitating a hybrid learning class to cognitive overload; The teacher must be present in interactions with students while simultaneously listening to an inner dialogue engaged in strategic involvement of relevant digital resources. This heavy mental load is referred to as *hyper zoom* or *hyperfocus* (Bower et al., 2015; Ørngreen, 2015; Zydney et al., 2019). The mental exhaustion resulting from this heavy mental load has been referred to as *zoom fatigue* (Wiederhold, 2020).

Wiederhold (2020) explained the physiological effect of using videoconferencing programs. According to the researcher, the delay in communication, even if only a millisecond, caused by the use of video conferencing systems interrupts the precisely timed vocalizations, gestures, and movements that humans use to communicate (Wiederhold, 2020). This delay causes the human brain to work harder to overcome the

interruption and restore synchrony (Wiederhold, 2020). In addition, Wiederhold (2020) noted that enlarged faces and prolonged eye contact often associated with video conferencing are registered by the brain as threatening. As a result, the body floods with stress hormones that leave individuals feeling tired (Wiederhold, 2020).

2.4.9 Hybrid Learning in Elementary Schools

Much of the research involving digital learning tools at the elementary school level has focused on blended learning programs that took place inside schools. Synchronous hybrid learning at the elementary school level did not become a focus for research until the COVID-19 pandemic disrupted earlier methods. While research on hybrid learning models is limited at the elementary school level, the flexibility and adaptability of these modalities are attractive to educators at all levels (McCabe & Francis, 2020). The current study seeks to examine the impact that the hybrid modality of learning had in elementary schools in South Carolina, specifically in the third grade. Therefore, a careful review of the literature approaching the identified gap is warranted.

Much of the recent research investigating hybrid learning in an elementary school environment is centralized in Indonesia. Handayani and Utami (2020), for instance, examined the effectiveness of hybrid learning modalities on character-building education in Indonesia. Zakaria et al. (2022) quantitatively compared face-to-face and hybrid learning outcomes of fourth-grade elementary school students in Indonesia. Fadhila and Hidayati (2021) examined the relationship between teacher performance and student learning motivation in two Indonesian elementary schools using a correlative, quantitative research design. Generally, the research indicated that hybrid learning was an

effective instructional method within Indonesian elementary schools across multiple teaching disciplines (Fadhila & Hidayati, 2021; Handayani & Utami, 2020; Zakaria et al., 2022).

Other studies exploring hybrid learning methods in elementary schools have relied heavily on qualitative methods. Moore (2022), for example, employed qualitative research to gain an understanding of teachers regarding their experiences with providing instruction in a synchronous hybrid learning environment in a rural elementary school in North Carolina. Moore's (2022) findings aligned with prior research that professional development and training on the implementation of hybrid learning for teachers is a necessary component of a hybrid learning program. Also, insufficient access to the internet, slow internet speeds, unfamiliarity with how to use technology, and lack of parent or guardian support were perceived to be barriers to educators' ability to teach (Moore, 2022).

Arnett (2021) surveyed administrators and teachers from across the United States to learn their perceptions about the teaching modalities applied during the 2020-2021 school year in 841 K-12 school districts. The results aligned with prior research that indicated synchronous hybrid instruction is mentally and physically taxing on educators (Arnett, 2021). In addition, teachers felt less able to provide remote students with social and emotional support than to in-person students. Yet, the majority of administrators and teachers surveyed indicated that they intended to use online resources more than they did before the pandemic (Arnett, 2021). Arnett (2021) cautioned that these results may be atypical of synchronous hybrid learning modalities because most schools implemented these programs hastily as an emergency response to the COVID-19 pandemic. While this

study is not delimited to elementary education only, it was included here as it was one of the few studies found that addresses synchronous hybrid learning outside of Indonesia.

2.4.10 Literature Based Descriptions of the Variables

2.4.10.1 Dependent Variable

In this study, the dependent variable of interest was students' third-grade reading scores, as measured by the South Carolina College- and Career-Ready (SC READY) assessment of English Language Arts (ELA) in the 2020-2021 school year. The SC READY assessment is administered annually to all public school students in grades 3–8 in the content areas of (ELA) and math (Chen et al., 2018). An independent evaluation conducted by the Human Resources Research Organization (HRRO) revealed that the SC READY assessment adhered to industry best practices for seven key elements of assessment design and implementation. The key elements examined were as follows: item development processes; item standards alignment and item quality; test construction processes; test administration procedures; scaling, rating, and scoring processes; psychometric processing and item parameters; and minimum legal requirements (Chen et al., 2018). The findings of the independent evaluation of the SC READY assessment conducted by the HRRO support the validity of the test scores for their intended uses and purposes (Chen et al., 2018).

While the SC READY assessment is a valid instrument for measuring student performance in reading, the 2020-2021 school year was impacted dramatically by the COVID-19 pandemic (Arnett, 2021). Instructional arrangements varied as most school systems operated emergency remote and hybrid modalities in the interest of student and

educator safety (Arnett, 2021). According to Arnett (2021), these programs differed from the high-quality online learning programs studied by the researcher previously because they were typically implemented without the benefit of advanced planning, educator development, or best-in-class online learning resources. Hence, Arnett (2021) cautioned that research related to hybrid learning during this period should be considered representative of emergency arrangements made during the pandemic and not an evaluation of online learning in general.

2.4.10.2 Independent Variable

The independent variable of interest was learning modality, with the two possible values consisting of hybrid learning modality and traditional learning modality. The hybrid learning modality has already been discussed in detail. Therefore, this section will summarize the traditional learning modality.

Traditional learning has been described as a teacher-centric learning method that takes place in person or face-to-face (Halasa et al., 2020). Teacher-centeredness has been described as a learning environment in which teachers are active and students are passive (Serin, 2018). In a traditional classroom, teachers conduct lectures as a means of disseminating information to students (Serin, 2018).

Traditional learning methods have been compared to several different online learning modalities for various reasons. Halasa et al. (2020), for example, compared student outcomes in traditional learning environments with those in a mixed modality that included blended learning and a flipped classroom to determine which was the most effective. Clayton et al. (2018) measured student preferences for traditional classrooms,

hybrid courses, or wholly online formats and found students significantly preferred traditional classrooms. Faulconer et al. (2018) compared failure rates, grade distributions, and withdrawal rates of students in an introductory Physics course across several learning modalities. Students who attended classes in person had significantly lower withdrawal rates than in hybrid or wholly online classes. However, those enrolled in wholly online courses were more likely to receive an A than in traditional or hybrid learning modalities (Faulconer et al., 2018).

While these studies offered insights into the differences between traditional classes and other learning modalities, all of the studies sought to understand the differences at the collegiate level (Clayton et al., 2018; Faulconer et al., 2018; Halasa et al., 2020). A *Google* search utilizing the terms *traditional learning*, *elementary*, and *hybrid* yielded zero results that encompassed all three terms indicating that very little research has made comparisons between traditional learning and hybrid learning at the elementary school level. This further underscores the importance of the current study to fill this gap in the research.

2.4.11 Methodology

The chosen methodology of the proposed study was a quantitative method. The purpose of quantitative research is to test theories, determine facts, demonstrate relationships between variables, or predict outcomes (Kumatongo & Muzata, 2021). In this study, quantitative analysis was utilized to examine the numeric impact of the variables of interest. This non-experimental study design can be used to inform school

policy and procedures as well as improve teaching methods and learning (Kumatongo & Muzata, 2021).

Studies that have explored hybrid learning in the past have largely relied upon qualitative research methods (Bülow, 2022). For example, Angelone et al. (2020) conducted an exploratory study utilizing case study methodology. The researchers gathered data from observations of blended sessions, debrief sessions, survey responses, and participant interviews to iteratively design, assess, and refine the technological design of a blended synchronous learning environment to improve the learner experience. Another study by Zidney et al. (2019) employed case study analysis to illustrate three different approaches to a synchronous hybrid teaching program called Here to There (HOT). The researchers emphasized the importance of sound pedagogical principles along with pragmatic considerations, such as class size, available technology, and instructors' skills when designing a blended synchronous approach to learning.

Other studies that employed quantitative methods relied on survey designs to gather data. Flynn-Wilson and Reynolds (2020), for instance, surveyed graduate students enrolled in virtual, hybrid, and traditional learning modalities over four semesters to understand the perceptions of graduate students surrounding the use of a virtual synchronous platform, called Adobe Connect. The researchers determined the interaction between students and faculty was more positive in the synchronous mode platform – and the level of satisfaction increased as students took more courses (Flynn-Wilson & Reynolds, 2020). Shamir-Inbal and Blau (2021) also used an online survey to gather data to understand the pedagogical, technological, and organizational challenges and benefits of computing-enhanced digital learning environments, and to explore teachers'

pedagogical strategies. Responses to the open-ended questionnaire yielded a variety of pedagogical distance learning strategies used by teachers (Shamir-Inbal & Blau, 2021). In addition, the teachers shared their perspectives on the pedagogical, technological, and organizational challenges and benefits of emergency remote teaching.

Some studies were found that relied upon statistical analysis to draw conclusions from hard data. Yang et al. (2020), for example, examined learning behavior data (teacher speaking time, audience total, timing of the first visit to the online classroom, viewing time, and completion rate) from live online prosthodontic courses held by an online dental school in China from February to May 2020. The researchers concluded that traditional learning modalities are significantly more conducive to student-teacher and student-student interactions because they involve a more natural method of communication than internet-based discussion (Yang et al., 2020).

2.5 Conclusion

The scant research related to the hybrid modality of instruction in elementary schools underscores the importance of the proposed study. The literature review revealed that the majority of research relating to hybrid learning has occurred at the collegiate level (Raes et al., 2020a). This is logical considering elementary schools have historically employed blended and traditional learning methods rather than hybrid learning modalities before the COVID-19 pandemic (Fadhila & Hidayati, 2021; Prescott et al., 2018; Seage & Türegün, 2020).

While the terms blended and hybrid learning are frequently used interchangeably in the literature (McCabe & Francis, 2020; Ghazali, 2022; Halasa et al., 2020; Lopes &

Soares, 2018; Ntim et al., 2021), Abi Raad and Odhabi (2021), Arnett (2021), and Ulla and Perales (2022) argued that the terms are distinguishable based on synchronicity; Hybrid learning involves teaching in person and online students simultaneously, whereas in blended learning, in person and online teaching happens asynchronously. Arnett (2022) further argued that the synchronous hybrid instructional arrangements used during the pandemic were primarily used to transmit traditional classroom instruction via the internet and offered none of the benefits previously associated with blended learning.

Four types of hybrid learning modalities were identified in the literature: rotational, flex, a la carte, and enriched virtual education (Singh et al., 2021). Of these, the rotational model, specifically station rotation, was identified as the most utilized learning modality in elementary schools pre-pandemic, other than traditional teaching (Lopes & Soares, 2018). A unique rotational model emerged during the pandemic to address safety concerns (Arnett, 2021). Most schools implemented a rotational schedule where students came to school for in-person instruction on alternating times, days, or weeks while others participated remotely (Arnett, 2021).

There were numerous benefits of hybrid learning identified in the literature. Flexibility was the most commonly mentioned and included increased access to learning (Amarin, 2020; Bower, et al., 2015; Singh et al., 2021; Wang & Rasmussen, 2020), pedagogical freedom (Bower et al., 2015), and greater student control over learning strategies (Binnewies & Wang, 2019; Ghazali, 2022). In addition, hybrid learning was associated with the facilitation of student-centered learning (Ghazali, 2022; Singh et al., 2021; Zydney et al., 2019), space for more students (Bülow, 2022; Ørngreen et al., 2013), increased student autonomy (Flynn-Wilson & Reynolds, 2020; Ghazali, 2022; Ørngreen

et al., 2013; Raes et al., 2020a; Shamir-Inbal and Blau, 2021; Singh et al., 2021; Wang & Rasmussen, 2020; Xie & Yang, 2020), and innovative pedagogy (Ghazali, 2022; Green et al., 2020; Liu et al., 2018; Lopes & Soares, 2018; Raes et al., 2020b; Shamir-Inbal & Blau, 2021).

The challenges to hybrid learning modalities included the digital competency of educators (Beatty, 2019; Bülow, 2022; Flynn-Wilson & Reynolds, 2020; Kundu et al., 2021; Ørngreen, 2015; Shamir-Inbal & Blau, 2021; Zydney et al., 2019), the quality and availability of equipment (Bülow, 2022; Flynn-Wilson & Reynolds, 2020; Shamir-Inbal & Blau, 2021), and difficulties communicating during live sessions (Angelone et al., 2020; Shamir-Inbal & Blau, 2021; Zydney et al., 2019). Further, hybrid learning posed specific threats to the well-being of both students and teachers. These threats included feelings of isolation and mental exhaustion (Abi Raad & Odhabi, 2021; Bower et al., 2015; Chemi, 2020; Chen et al., 2018; Green et al., 2020; Rambøll, 2020; Smith et al., 2020; Singh et al., 2021; Wang & Rasmussen, 2020; Yang et al., 2020; Zydney et al., 2020; Zydney et al., 2019).

Safety precautions necessitated by the COVID-19 pandemic required elementary schools to bring the hybrid model into mainstream usage (Dorn et al., 2020; Kaden, 2020). Hence, opportunities for new research relating to the hybrid learning modality are available at the elementary school level. Researchers in Indonesia have already begun to explore a variety of potential ways hybrid learning has impacted elementary school students. Research topics related to hybrid learning in Indonesia included character building (Handayani and Utami; 2020), student outcomes (Zakaria et al.; 2022), and student learning motivation (Fadhila and Hidayati; 2021). In general, the research

indicated that hybrid learning was an effective instructional method within Indonesian elementary schools across multiple teaching disciplines (Fadhila & Hidayati, 2021; Handayani & Utami, 2020; Zakaria et al., 2022).

Research of hybrid learning modalities conducted at the elementary school level by Moore (2022) aligned with prior studies. The digital competency of educators and the availability of technology were perceived to influence the effectiveness of synchronous hybrid learning. Further, teachers found synchronous hybrid learning to be mentally and physically taxing (Arnett, 2021). Finally, the synchronous hybrid programs studied by Arnett (2021) differed from the high-quality online learning programs studied previously because they were typically implemented without the benefit of advanced planning, educator development, or best-in-class online learning resources. Hence, Arnett (2021) cautioned that research related to hybrid learning during this period should be considered representative of emergency arrangements made during the pandemic and not an evaluation of online learning in general.

The following chapter will describe the research design and rationale for the current study. In addition, the methodological approach will be outlined, including sampling and recruitment strategies, data collection instrumentation, and data analysis plan. Finally, any applicable issues of trustworthiness or ethical concerns will be discussed.

CHAPTER 3

METHODOLOGY

The purpose of this quantitative causal comparative study was to examine the impact that hybrid modality of learning had on third grade reading EOC scores during the 2020-21 school year in public elementary schools in South Carolina. The study was guided by a single, overarching quantitative research question, namely: What is the difference in third grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year? In the previous chapter, Chapter 2, the literature underlying the study was examined in detail to fully develop the background to the study and its theoretical foundations. In Chapter 3, the research methods are explained in detail.

Chapter 3 begins with the justification of the post-positive research perspective, the quantitative research methodology, and the causal comparative design. Then, the population and sample are discussed, along with the study site. Next, the instrumentation with which data were collected are presented. Following the instrumentation is a discussion of data collection and data analysis. The chapter concludes with research ethics. Through these key sections, this chapter details and justifies the key methodological choices for the study.

3.1 Research Design and Approach

3.1.1 Research Perspective

A post-positivist perspective was used to frame this study. Post-positivism supposes that truth may be determined through empirical research methods (Fox, 2008). Studies using a post-positivist perspective often utilize quantitative methods, employing rigorous testing to determine relationships that are presumed to exist in the real world. This position contrasts with constructivism, which posits that no such truth exists; instead, only individuals' realities can be accessed. These realities are shaped by individuals' experiences and the subjective way individuals make sense and meaning from those experiences (Fox, 2008). It is essential to acknowledge that students learn by observation, processing, interpretation, and personalizing the information into personal knowledge (Anderson, 2008). As such, they construct knowledge. However, the study utilized methods in examining students' knowledge construction that align with post-positivism. Specifically, the study utilized the assumption that truth may be determined through empirical research methods, specifically through assessment of third grade students' reading performance and statistical testing to determine if a significant difference existed in these scores from the learning modality students experienced.

3.1.2 Research Approach

In alignment with the post-positivist perspective, the study was conducted using a quantitative methodology. Quantitative research is numerical and relational in its approach to addressing a research problem (Balnaves & Caputi, 2001). A quantitative

study focuses on specific variables and the relationships between them (Creswell & Creswell, 2018). Because these variables are either inherently numerical or possible to quantify using existing, validated instruments, the resulting data are short-form (Balnaves & Caputi, 2001). That is to say, because of their quantified nature, quantitative data are closed-ended. This allows a researcher to collect data from large sample sizes and draw on the resultant statistical power that such samples provide (Creswell & Creswell, 2018). However, because of the closed-endedness of the data they pertain too, quantitative studies must be based in existing theory and cannot explore new ideas (Balnaves & Caputi, 2001). Overall, quantitative research is ideal when the key variables are easily quantified and when existing theory provides a set of key hypotheses which the study can test (Creswell & Creswell, 2018).

A quantitative methodology aligned well with the proposed study. First and foremost, this study was relational in nature. The central issue in the study was whether a relationship exists between type of school (hybrid/traditional) and third grade reading outcomes. Secondly, the study was deeply grounded in the theoretical foundations of Piaget's (1954) cognitive constructivism theory of learning. This theoretical foundation gave rise to the necessary quantitative hypotheses. In addition, the study addressed variables that were either easily quantified as categorical/dichotomous (e.g., type of school or race) or innately quantitative in nature (the EOC test scores). Finally, the study aligned with a quantitative method because student data existed in the volumes necessary to carry out a quantitative study. Hence, a quantitative methodology is a good fit.

The alternative methodology would be qualitative. Qualitative research is more subjective in nature (Merriam & Tisdell, 2015). In a qualitative study, the researcher

focuses on the opinions and perceptions of the study participants (Hammarberg et al., 2016). Hence, qualitative research does not focus on specific variables, but rather broader phenomena (Merriam & Tisdell, 2015). Qualitative research is open-ended and exploratory in nature, making it good for addressing topics that theory does not yet adequately cover (Hammarberg et al., 2016). In addition, a qualitative methodology is descriptive, collecting long-form data from a few participants (Merriam & Tisdell, 2015). Therefore, qualitative research cannot achieve statistical power and instead is used to produce more in-depth exploration and description (Hammarberg et al., 2016).

A qualitative methodology would have been a poor fit for the proposed study for several reasons. Firstly, the participants in the study were third grade students. Qualitatively accessing this population would have been ethically fraught. Secondly, the study did not need qualitative exploration. Existing theory provided the research question and hypothesis for testing. Thirdly, the study focused on the relationships between variables rather than on exploring a central phenomenon. Furthermore, long-form qualitative data would not have allowed the study to achieve the desired statistical power and thus would not have produced a generalizable result. For these reasons and more, the study was poorly aligned with a qualitative research methodology and approach to research.

3.1.3 Research Design

The study used a nonexperimental historical causal comparative research design. Within the quantitative methodology, there are two main sets of research designs: the experimental and the nonexperimental (Johnson, 2001). Experimental research is the

ideal, as it is stronger, with the ability to determine causal relationships (Ross & Morrison, 2013). However, experimental research is also very difficult to carry out, as doing so requires stringent preconditions (Ross & Morrison, 2013). In particular, the researcher must be able to control variables and also randomize the participants into test and control groups. In this study, the researcher lacked the resources or authority to control whether a school used in-person or hybrid learning. Moreover, the necessity of hybrid learning because of the pandemic means that randomization of groups would be impossible. Therefore, an experimental design was determined to be impossible. Hence, a nonexperimental approach was used instead. Nonexperimental research uses real-world data to draw weaker but still important conclusions (Johnson, 2001).

Within the nonexperimental designs, the three main types are causal comparative, correlational, and descriptive. A causal comparative or *ex post facto* design is used to compare outcomes across two or more circumstances that have diverged naturally (Johnson, 2001). Such a design was ideal for the study, which compared the results for schools that adopted hybrid learning and schools that used in-person learning. A correlational design involves examining the predictive relationship between variables (Creswell & Creswell, 2018). At the present study compared contexts rather than examining predictive relationships, a correlational design would not have aligned. A descriptive design does not seek to test any hypotheses (Johnson, 2001). The present study was focused on inferential testing and therefore could not have used a descriptive design.

A causal comparative design can be historical, cross-sectional, or longitudinal (Johnson, 2001). This study was historical. A historical design uses existing, secondary

data (Creswell & Creswell, 2018). The present study was historical because it used such data. A cross-sectional design collects cross-sectional data from the population at a single point in time (Johnson, 2001). Such a design is only necessary when no good secondary data exist. Since secondary data existed, this study was not cross-sectional. Finally, a longitudinal study examines effects over time (Creswell & Creswell, 2018). The present study was concerned only with the pandemic period and hence was not longitudinal.

3.2 Setting and Sample

The population of interest consisted of all elementary school students in the state of South Carolina. Within this overall population, the target population was all third grade students in the state of South Carolina. Third grade was the focus of this study because third grade reading ability plays a key role in determining student' academic success going forward (Lee-St. John et al., 2018; Simonton, 2016; Wolter, 2017). The only inclusion criteria for the study were that students be (a) in the third grade, (b) live in South Carolina for the whole of the 2020-2021 academic year, and (c) attend either traditional/in-person classes or hybrid classes for 2020-2021.

Within the target population, all available student data were sampled. This represents an exhaustive approach to sampling, in which the sample is equal to the target population. Exhaustive sampling was made possible through the use of secondary data, which are available from districts in South Carolina. Hence, the study setting was schools in the state of South Carolina. Using the independent samples *t*-test described below in the analysis section, the minimum necessary sample size for the proposed study was 128 students, with at least 64 from in-person schools and at least 64 from hybrid schools. This

value was determined through a G*Power analysis using a statistical power of 80%, a medium effect size, and a significance level of 0.05.

3.3 Instrumentation and Materials

The instrumentation for the proposed study consisted exclusively of secondary data drawn from the South Carolina Department of Education. The data were at the student level, for all schools across the state that used either in person or hybrid learning for the years 2020-2021. The specific variables that were retrieved for the study were as follows:

3.3.1 EOC Reading Scores

EOS reading exam scores were the dependent variable for the study. The EOC scores consisted of scores on the SC READY ELA EOC, a standardized EOC test used by all schools in South Carolina to assess students' reading ability relative to standards and the state curriculum. The SC READY ELA EOC is a carefully developed and validated measure. As a functional instrument, it has not been validated in the same fashion as a research instrument, but it has been refined over time to more closely align with the learning standards it is intended to measure. EOC scores were continuous data, measured as a student's score from 0-100 on the EOC reading exam.

3.3.2 Learning Modality

Learning modality was the primary independent variable for the study. Modality was a dichotomous variable with possible values of 0 for traditional/in-person learning

and 1 for hybrid learning. Because learning modality is a naturalistic measure of the underlying construct, it was considered to have perfect reliability and validity barring clerical errors.

3.3.3 Race/Ethnicity

Race/ethnicity was a secondary independent variable. Race/ethnicity was measured as a categorical variable. The racial and ethnic categories used aligned with those used on the US Census. Race and ethnicity were combined to create categories such as “Non-Hispanic White.” As race/ethnicity is a naturalistic measure of the underlying construct, it was considered to have perfect reliability and validity barring clerical errors.

3.3.4 Socioeconomic Status

Socioeconomic status (SES) was a secondary independent variable. SES was measured as a categorical variable that indicated whether students receive no lunch reduction (0), reduced lunches (1), or free lunches (2). Free and reduced lunches were the only proxy for SES available in the dataset.

3.3.5 Special Education Status

Special education (SPED) status was a secondary independent variable. SPED status was measured as a dichotomous variable with values of 0 for non-SPED and 1 for SPED. As SPED status is a naturalistic measure of the underlying construct, it was considered to have perfect reliability and validity barring clerical errors.

3.3.6 Gender

Gender was a secondary independent variable. Gender was measured as a categorical variable with values of 0 for male, 1 for female, or 2 for other. Because gender is a naturalistic measure of the underlying construct, it was considered to have perfect reliability and validity barring clerical errors.

3.4 Data Collection and Analysis

3.4.1 Data Collection

Data collection for the study proceeded as follows. First, IRB approval for the study was obtained. Because the study involved only anonymous secondary data, IRB approval was expected to be straightforward. Once all approvals were obtained, the data collection began. An email was drafted and sent to superintendents of rural districts in South Carolina, indicating precisely which data are needed as detailed in the prior section. Only the six key variables for the study plus an identification number were requested (the numbers being assigned as the data were retrieved). Superintendents agreeing to participate will be asked to send the requested data in a Microsoft Excel file. Once a sufficiently large sample was achieved (i.e., one 128 or more students), data collection for the study ended. The data were then combined and imported into SPSS statistical software for the data analysis.

3.4.2 Data Analysis

The data analysis for the study was conducted using descriptive and inferential statistics. All analyses were performed using the latest version of SPSS statistical analysis software. As the first step in the analysis, the data were cleaned. Any datapoints missing one of the six variables were excluded from the analysis. Then, the data were subjected to a descriptive analysis. The descriptive analysis involved calculating and tabulating key values for the data. For nominal data, namely districts' learning modality and the other independent variables, frequency and percentage were calculated. For interval data, consisting of third grade students' SC READY ELA scale scores, minimum, maximum, mean, median, and standard deviation were calculated. Then, an inferential analysis was used to answer the research question. To recall, the research question and associated hypotheses were:

RQ1: What is the difference in third grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year?

H1₀: There is no difference in third grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year.

H1_a: There is a difference in third grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality

of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year.

To test the hypotheses, an independent sample *t*-test was employed. The test was two-tailed. An independent sample *t*-test is used to determine whether or not the mean differs between two different samples (Gerald, 2018). Hence, the mean of the reading EOC scores was compared between hybrid and traditional schools using the test. If there was a significant difference between the two types of learning, then the null hypothesis would be rejected. If the test indicates, at a significance level of 0.05, that there is a significant difference, it would be possible to interpret the numerical values of the two means to determine which modality has yielded better results.

Then, regardless of the overall answer, each of the secondary independent variables were tested as a moderating effect on the primary independent variable. To recall, the secondary independent variables are race/ethnicity, socioeconomic status, SPED status, and gender. Given the large sample size available, it was possible to conduct an individual two-tailed, independent samples *t*-tests within each secondary independent variable category. For example, gender involved comparing the effects of learning modality on reading EOC scores for boys, girls, and others (if any). This enabled a more nuanced analysis and a better understanding of the ways in which the effects of hybrid learning differ for different groups of students at the third grade level.

3.5 Research Ethics

Ethical research practices were followed throughout the study. Most importantly, the study was conducted using anonymized secondary data. The use of anonymous

secondary data prevented the need for any primary data collection. This expedited IRB approval and removed the need for informed consent. The most important point of authorization was requesting the permission from rural district superintendents in South Carolina to access and use deidentified student data. Hence, not only did the study not contain identifying information, but the researcher never had access to it.

Once obtained, the data were stored securely. When not in use, the data were stored on a password-protected USB drive. The USB drive was stored in a locked desk drawer when not in use. Only the researcher and approved university personnel had access to the data. The data will be stored for five years following the publication of the study, then fully deleted through reformatting of the USB drive on which they are stored. Overall, the study is expected to pose no ethical risk or risk or harm to participants.

CHAPTER 4

RESULTS

The purpose of the quantitative causal comparative study was to examine the impact that hybrid modality of learning had on third grade reading EOC scores during the 2020-21 school year in public elementary schools in South Carolina. Specifically, the study examined whether third grade students' reading performance, as measured by the SC READY ELA assessment, vary as a function of students' enrollment in a district using a hybrid modality of instruction as compared with a traditional modality during the 2020-2021 school year.

The research questions and associated hypotheses used to guide this study are as follows:

RQ1: What is the difference in third grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year?

H1_o: There is no difference in third grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year.

H1_a: There is a difference in third grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year.

4.1 Data Collection

After gaining approval to obtain secondary data for the study, emails were drafted and sent to the superintendents of rural school districts in South Carolina to request deidentified student data related to the study. The request for information included the schedule type (i.e., traditional or hybrid), gender, race, giftedness, setting (i.e., special education or non-special education), and the ELA scores. Superintendents or other district staff from five districts responded, representing three districts using hybrid settings and two districts using traditional settings. In all, the five districts submitted data for 1,455 students. Given that the minimum sample size to achieve sufficient statistical power in the study was 128 students, the sample of 1,455 was more than sufficient to ensure that the results of the statistical analysis were capable of testing the study's hypotheses.

Only the six key variables for the study plus an identification number were included (the numbers being assigned as the data are retrieved). The dataset was then retrieved using a physical flash drive by the researcher. Once the data were received, they were imported into SPSS statistical software for the data analysis.

Additional qualitative data were collected to corroborate the quantitative findings and to describe the journeys of superintendents through the pandemic. Qualitative data

were collected from individual interviews of three superintendents of school districts in South Carolina. The three participants were asked about their experiences during the transition from traditional face-to-face classes to fully online classes to hybrid and return to face-to-face settings during the school year 2020-2021 to the ongoing school year 2022-2023. The participants were referred to as Participant 1, Participant 2, and Participant 3 to protect their identities. The interview data were recorded, transcribed, and imported to NVivo version 12, a qualitative data analysis software, in preparation for analysis.

4.2 Results

The data analysis for the study were conducted using descriptive and inferential statistics. All analyses were performed using the latest version of SPSS statistical analysis software. As the first step in the analysis, the data were cleaned. Any datapoints missing one of the six variables were excluded from the analysis. After data cleaning, a total of 1,455 student data were included in the analyses. Table 1 presents the frequencies and percentages of nominal variables. For the schedule type, there were 830 students from a hybrid schedule ($n = 57\%$) while 625 students were from a traditional schedule ($n = 43\%$). In terms of gender, 745 students were males (51.2%) while 710 students were females (48.8%). For the race of participants, most participants were Whites ($n = 726$, 49.9%), Blacks ($n = 462$, 31.8%), and Hispanics ($n = 224$, 15.4%). Majority of the participants involved in the study were not gifted ($n = 1,395$, 95.9%) and were from a non-special education setting ($n = 1,228$, 84.4%).

Table 4.1 Frequencies and Percentages of Nominal Variables ($N = 1,455$)

		Frequency	Percent
Schedule Type	Hybrid	830	57.0
	Traditional	625	43.0
	Total	1455	100.0
Gender	Male	745	51.2
	Female	710	48.8
	Total	1455	100.0
Race	American Native/Alaskan Native	9	.6
	Black	462	31.8
	Hispanic	224	15.4
	Multiracial	33	2.3
	Pacific Islander	1	.1
	White	726	49.9
	Total	1455	100.0
Gifted	Yes	60	4.1
	No	1395	95.9
	Total	1455	100.0
Setting	Special Education	227	15.6
	Non-Special Education	1228	84.4
	Total	1455	100.0

Table 2 presents the descriptive statistics of students' ELA scores. The mean ELA score was 395.11 ($SD = 116.68$). The lowest ELA score was 148 while the highest ELA score was 825. The ELA score was used as the dependent variable in the analyses for this study. Shapiro-Wilk's test was conducted to determine whether the data follows the normal distribution. The result of the Shapiro Wilk's test determined that the data was not normally distributed. Therefore, non-parametric independent samples t -tests were used for the analyses. The histogram presented in Figure 1 also shows that the distribution is not normally distributed as there are more datapoints on the left side of the distribution. Therefore, Mann-Whitney U tests were more appropriate for the analyses.

Table 4.2 Descriptive Statistics of ELA Scores

	<i>N</i>	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	<i>Shapiro Wilk's</i>	<i>p</i>
ELAVSS	1455	148.00	825.00	395.11	116.68	.976	<.01

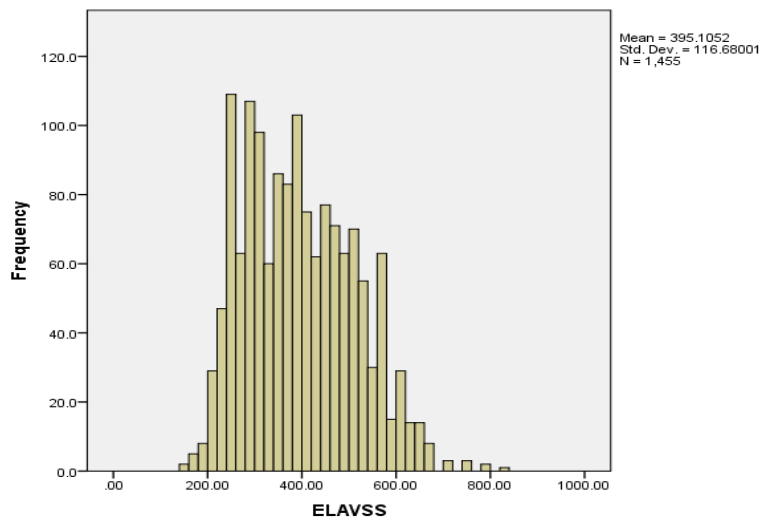


Figure 2.1 Histogram of ELA Scores

Frequencies and percentages of gender based on schedule type are presented in Table 3. As observed, the gender distribution for hybrid and traditional students are similar. There are slightly more male participants ($n = 429$, 51.7%) than female ($n = 401$, 48.3%) participants in the hybrid group. There are also slightly more male participants ($n = 316$, 50.6%) than female ($n = 309$, 49.4%) participants in the traditional group.

Table 4.3 Frequencies and Percentages of Gender Based on Schedule Type

Schedule Type		Frequency	Percent
Hybrid	Male	429	51.7
	Female	401	48.3
	Total	830	100.0
Traditional	Male	316	50.6
	Female	309	49.4
	Total	625	100.0

In terms of the race of hybrid and traditional students, the frequencies and percentages are presented in Table 4. In both groups, most students identified as White. However, there are more Black participants in the hybrid schedule (36.4%) as compared to traditional schedule (25.6%). On the other hand, there are more Hispanic participants in the traditional schedule (22.7%) as compared to the hybrid schedule (9.9%).

Table 4.4 Frequencies and Percentages of Race Based on Schedule Type

Schedule Type		Frequency	Percent
Hybrid	American Native/Alaskan Native	7	.8
	Black	302	36.4
	Hispanic	82	9.9
	Multiracial	17	2.0
	White	422	50.8
	Total	830	100.0
Traditional	American Native/Alaskan Native	2	.3
	Black	160	25.6
	Hispanic	142	22.7
	Multiracial	16	2.6
	Pacific Islander	1	.2
	White	304	48.6
	Total	625	100.0

The distribution of participants according to giftedness and schedule type is presented in Table 5. As observed, almost all of the students in the traditional schedule are not identified as gifted ($n = 615$, 98.4%). For the hybrid schedule, 94% ($n = 780$) are not gifted while 6% are gifted ($n = 5$).

Table 4.5 Frequencies and Percentages of Giftedness Based on Schedule Type

Schedule Type		Frequency	Percent
Hybrid	Yes	50	6.0

	No	780	94.0
	Total	830	100.0
Traditional	Yes	10	1.6
	No	615	98.4
	Total	625	100.0

For the instruction setting, the frequencies and percentages are presented in Table 6. As observed, there were 108 special education students (13%) and 722 non-special education students (87%) in the hybrid schedule. There are 119 special education students (19%) and 506 non-special education students (81%) in the traditional schedule.

Table 4.6 Frequencies and Percentages of Instruction Setting Based on Schedule Type

Schedule Type		Frequency	Percent
Hybrid	Special Education	108	13.0
	Non-Special Education	722	87.0
	Total	830	100.0
Traditional	Special Education	119	19.0
	Non-Special Education	506	81.0
	Total	625	100.0

Table 7 presents the descriptive statistics of ELA scores based on the schedule type. The mean ELA score for hybrid schedule is 408.18 ($SD = 122.54$) while the mean ELA score for traditional schedule is 377.75 ($SD = 106.04$). The range of scores for hybrid was 148 to 825 while the range of scores for traditional was 163 to 679.

Table 4.7 Descriptive Statistics of ELA Scores Based on Schedule Type

Schedule Type	<i>N</i>	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>
Hybrid	830	148.00	825.00	408.18	122.54
Traditional	625	163.00	679.00	377.75	106.04

To test the hypotheses posed in the study, Mann-Whitney U tests were conducted. Table 8 presents the result of the Mann-Whitney U test for the difference in mean ranks of ELA scores between hybrid and traditional schedule. The results showed that there is a significant difference in mean ranks ($Z = -4.553, p < .001$). The result showed that hybrid participants have a higher mean rank as compared to traditional participants (Mean Rank = 670.21). Therefore, the hybrid schedule participants have significantly higher mean scores as opposed to traditional schedule participants. There is sufficient evidence to reject the null hypothesis which stated that there is no difference in third grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year.

Table 4.8 Mann-Whitney U Test for ELA Scores Based on Schedule Type

Schedule Type		N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	p
ELAVSS	Hybrid	830	771.51	640356.50	223258.5	-4.553	0.000
	Traditional	625	670.21	418883.50			
	Total	1455					

In the interview with Participant 2, the superintendent perceived that the hybrid setting allowed for the integration of the “best” practices in a traditional setting with the technology tools that enhanced instruction. Thus, students in the hybrid setting were believed to have higher “collaboration, innovation and engagement” than students in the traditional setting which may have contributed to the students’ test scores. Participant 2 stated:

By combining the best of traditional classroom practices and instructional technology tools, we can create a powerful learning experience for students that foster collaboration, innovation and engagement. We can use instructional technology to close the achievement gap rather than widening it.

To further analyze the data, a Mann-Whitney U test was conducted to determine whether the ELA scores are significantly different between hybrid and traditional schedule for gifted students. The result is presented in Table 9. The result showed that there is no significant difference in mean ranks of ELA scores between gifted hybrid and traditional schedule participants ($Z = -0.717, p = .473$).

Table 4.9 Mann-Whitney U Test for ELA Scores Based on Schedule Type (Gifted Students)

Schedule Type		N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	p
ELAVSS	Hybrid	50	31.22	1561.00	214	-0.717	0.473
	Traditional	10	26.90	269.00			
	Total	60					

In the interviews, the three superintendents had different perceptions about the performances of students in the hybrid and traditional settings. Participant 1 perceived that, regardless of the setting, students can achieve “similar levels of academic success” provided that teachers utilized the best practices in using technology tools. On the contrary, Participant 2 believed that only gifted students tended to do well in any setting. Students with low academic achievements tended to struggle in online settings. However, for Participant 3, students of any academic achievement tended to do well in hybrid settings. The participant explained that students received whole group instruction during

the face-to-face classes and then afforded the flexibility in learning during online learning. Participant 3 shared that they tasked the teachers to plan the face-to-face instruction such that when students were in online sessions, they can do the work and learn independently. Participant 3 elucidated:

If students [were] there [for] a day and the groups came in, they got face-to-face instruction, they fully understand [the lessons]. The next day, you're going to have assignments in Schoology. You go pull those things down, and we were very cautious with our teachers such that [the students] are working independently [when online].

A Mann-Whitney U test was conducted to determine whether the ELA scores are significantly different between hybrid and traditional schedule for special education students. The result is presented in Table 10. The result showed that there is no significant difference in mean ranks of ELA scores between special education hybrid and traditional schedule participants ($Z = -0.642, p = .521$).

Table 4.10 Mann-Whitney U Test for ELA Scores Based on Schedule Type (Special Education Students)

Schedule Type		N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	p
ELAVSS	Hybrid	108	116.94	12629.00	6109	-0.642	0.521
	Traditional	119	111.34	13249.00			
	Total	227					

In the interviews, Participants 1 and 2 stated that special education students generally experienced inequities during the shift to online classes. Participant 1 shared that special education students and their families tended to lack devices and proper internet connection more than the general education students. Participant 1 emphasized

making accommodations within the plans to continue to educate the special education students. Participant 1 stated, “[We are] making sure they had access that was equitable based on their abilities...[through] instructional continuity plan with curriculum designs, plans for access to devices and connectivity, and supports for parents and teachers that are activated whenever needed.” Participant 2 similarly described providing accommodations to special education students as they experienced inequities in online learning. Participant 2 shared providing “increased guidance” for special education students.

A Mann-Whitney U test was conducted to determine whether the ELA scores are significantly different between hybrid and traditional schedule for male students. The result is presented in Table 11. The result showed that there is a significant difference in mean ranks of ELA scores between male hybrid and traditional schedule participants ($Z = -3.228, p = .001$). The male hybrid schedule students have significantly higher mean ELA scores than male traditional schedule students as indicated by the higher mean rank value of 394.84.

Table 4.11 Mann-Whitney U Test for ELA Scores Based on Schedule Type (Male Students)

Schedule Type	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	p	
ELAVSS	Hybrid	429	394.84	169385.50	58413.5	-3.228	0.001
	Traditional	316	343.35	108499.50			
	Total	745					

A Mann-Whitney U test was conducted to determine whether the ELA scores are significantly different between hybrid and traditional schedule for female students. The

result is presented in Table 12. The result showed that there is a significant difference in mean ranks of ELA scores between female hybrid and traditional schedule participants ($Z = -3.288, p = .001$). The female hybrid schedule students have significantly higher mean ELA scores than female traditional schedule students as indicated by the higher mean rank value.

Table 4.12 Mann-Whitney U Test for ELA Scores Based on Schedule Type (Female Students)

Schedule Type	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	p	
ELAVSS	Hybrid	401	377.71	151463.50	53046.5	-3.288	0.001
	Traditional	309	326.67	100941.50			
	Total	710					

The interview participants did not reference gender as part of the attributes that may have influenced ELA scores in both hybrid and traditional settings.

A Mann-Whitney U test was conducted to determine whether the ELA scores are significantly different between hybrid and traditional schedule for Black students. The result is presented in Table 13. The result showed that there is no significant difference in mean ranks of ELA scores between Black hybrid and traditional schedule participants ($Z = -1.229, p = .219$).

Table 4.13 Mann-Whitney U Test for ELA Scores Based on Schedule Type (Black Students)

Schedule Type	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	P	
ELAVSS	Hybrid	302	237.06	71591.00	22482	-1.229	0.219
	Traditional	160	221.01	35362.00			

ELAVSS	Hybrid	422	403.48	170270.50	47270.5	-6.054	0.000
	Traditional	304	308.00	93630.50			
	Total	726					

In terms of race, only Participant 2 described that ethnic and minority racial groups may experience inequities in online learning. The participant described students from minority groups to be “vulnerable and struggling.” However, the ethnic and minority racial groups were not specified.

4.3 Interview Results

This section contains the themes that emerged from the individual interview of the three district superintendents. The themes were generated from the inductive analysis of the interview data using NVivo 12. Six themes emerged from the data which were: (a) unpreparedness for sudden shifts in learning modalities, (b) changes in the responsibilities of parents, teachers, and superintendents, (c) supported students, parents, and teachers, (d) made informed decisions for the benefit of the students, (e) addressed inequities in learning, and (f) integrated technology and improved instruction delivery using virtual platforms. The overall narrative of the participants’ experiences of the impacts of the hybrid learning modality was influenced by the challenges, best practices, and outcomes of their experiences of the transition from the traditional setting before the pandemic to the fully online setting during school year 2020-2021 to the current hybrid and face-to-face settings.

4.3.1 Unpreparedness for Sudden Shifts in Learning Modalities

One challenge that the superintendents identified in shifting the classroom setting from face-to-face to online to hybrid was the lack of being prepared of the involved individuals. Furthermore, the superintendents, teachers, and parents were generally unprepared to transition from traditional to online classes, as the shift came suddenly during the beginning of the COVID-19 pandemic in 2020. Participants 2 and 3 also stated that the schools lacked the provisions to conduct classes online. Participant 2 stated:

Asking school districts, in a matter of a few months, to replace a system of traditional education that has been in place for hundreds of years, is a big task. Because remote or hybrid teaching has rarely existed at all educational levels before, there would have been no reason for an expectation of readiness to flip a switch and begin teaching students through a hybrid or fully remote form.

Participant 1 shared that being technologically-inclined and working towards one-to-one ratio of student to device prior to the pandemic and the shift to online classes helped in their practice of the continuity of providing instruction for their students. Participant 1 stated, “We were very fortunate that we had already been going one is to one...Already very accustomed to delivering instruction via technology.” However, Participant 1 experienced a challenge in preparing and supporting the teachers for online teaching and using online learning platforms, as not all teachers were tech savvy.

Participants 2 and 3 also perceived that the shift to the online setting in 2020 would only last for a few weeks. The three participants cited equity problems when the traditional setting did not resume for a few months. Participant 1 reported no problems in students having devices to use for online classes, but being in a low-income rural district,

some students experienced problems with internet connectivity. Participants 2 and 3 disclosed the challenge in providing one device for each student to use in online learning. Upon receiving federal funds, the participants shared that they immediately purchased devices for their students. Participant 3 stated, “So once that first wave of money came in, and we did what everybody else did...we put our elementary...we started [with] K through two, we did iPads and in three through 12, we [provided] laptops.”

Participant 2 also cited the inequities experienced by low-achieving students and students from ethnic and racial minority groups when classes were conducted online. The participants shared that students were expected to be somewhat learning independently in the online setting particularly when doing assignments. Participant 2 perceived that “vulnerable” students may have struggled with completing assignments by themselves. Participant 2 articulated:

High-achieving learners tend to be minimally affected by online schooling; students who do fine anywhere tend to do fine online. The online penalty is more severe for vulnerable and struggling students—students with low prior achievement or from disenfranchised ethnic and racial groups.

Participants 1 and 2 shared that they experienced difficulties in preparing for online instruction in 2020, as the community had divided opinions about the policies surrounding COVID-19 restrictions. Participant 1 shared that their district was located in a rural area where the community make their own decisions. Participant 1 shared that some community members perceived that their “choices were being taken away” because of the COVID-19 restrictions and did not agree with the school closure and distance learning policies. Participant 1 shared:

We have always had a very strong culture of local control in this county and don't like the state poking around in our business. But the virus has given a lot more authority to the state and that's not been easy for my folks to swallow. That's spooked some people because they feel like their choices are being taken away. I think as a community, there's been a lot of division that we've had to deal with as a school district. There has been some division about whether we should be in school or whether we should be out of school.

Participant 2 shared that some parents and board members “politicized” the implemented COVID-19 restrictions, which also affected the district's response to the crisis. Participant 2 stated:

The school openings, vaccinations, and masking were politicized during the pandemic. Parents and community members behaved outrageously on social media and at school board meetings...the board members' own political perspective tended to shape their willingness to close schools or adopt health and safety precautions.

4.3.2 Changes in the Responsibilities of Parents, Teachers, and Superintendents

Another challenge experienced by the three superintendents was the changes in their own responsibilities as well as the responsibilities of parents and teachers in instructing the students during the transitions of the learning modalities in the past three years. Participants 1 and 2 shared that their roles shifted from supporting teachers and students to accomplishing pandemic-related tasks. Participant 2 explained:

I was reading about things like community spread, viral transmission, social distancing guidelines, and quarantine guidance? That's literally what I am reading now because that's what I need to be familiar with to do this job. It's honestly become a welcome distraction for me when I can talk about teaching and learning because there isn't much of that now. We had to learn new skills with rapid adjustment that attributed to the pandemic as well as the new learning the pandemic demanded in their work.

As schools reopened for full face-to-face or hybrid setting, Participant 1 shared that their work as a superintendent shifted to monitoring the implementation of health and safety measures to prevent the spread of the disease. The change in responsibilities also took away the focus on teaching students and helping them achieve high test scores.

During online classes, Participant 1 shared that they also had no way to hold teachers accountable. Participant 1 stated, "You must be a realist and understand that not everyone is going to work at the same level. Some teachers will go the extra mile, and some will do the minimum." Participant 1 expressed their understanding that teachers as well as students may have experienced stress as a result of the transitions of learning modalities. Participants 1 and 2 perceived that they were tasked to address the socio-emotional needs of teachers and students to continue to support their teaching and learning.

As classes were held remotely, most students attended online classes in their homes. Parents were expected to help their children with online classes. However, Participant 3 stated that not all parents can sit with their children for online classes and help with assignments. Participant 3 shared, "Number one, [parents] can't help their

children but some of them that would want to help say I don't understand that.” To continue educating students in the online setting, Participants 1 and 2 believed that they needed to engage their students. Both participants expressed that their teachers experienced challenges in fulfilling the roles of engaging students online. Participant 2 stated, “The inability to engage students in an online environment as was one of the most significant challenges our teachers encountered while transitioning to online learning.”

4.3.3 Supported Students, Parents, and Teachers

In order to maintain or improve the students’ test scores, the participants shared that their best practices when transitioning from one learning modality to another included providing support for students, parents, and teachers. At the beginning of school closure and shift to online learning in 2020, the participants shared that they continued feeding their students and their families. Providing food for the students and their families was as much of a priority as continuing to provide instruction. Participants 2 and 3 shared that the families were called to pick up meals and worksheets during the beginning of school closures.

Participants 1 and 2 also shared supporting teachers through implementing measures to ensure their safety and through providing them with continuous education to adapt to the new learning modality. Participant 2 elaborated:

My district focused on the Google Suite and Video conferencing programs initially, which allowed technology adverse staff to be trained and become more comfortable with basic remote instructional delivery. We worked through

professional development on learning loss and closing the gap, before shifting their focus to social-emotional training.

4.3.4 Made Informed Decisions for the Benefit of the Students

The participants' best practices in addressing low test scores also included making informed decisions about the suitable pedagogies for the students. Participant 1 shared making data-driven decisions using pre-assessment scores to identify areas of improvement. All three participants also sought information from teachers and other experts to address the problem of students' low test scores. Participant 3 stated:

The pandemic has really changed who sits at my table when I make a decision. It used to be my principals, finance department, and folks on the operational side. Now, when I make a major decision, I have the county health director on the phone, the nurse is in here, and I have a member of the board who is a family medical doctor.

Participant 1 shared that several individuals had different, sometimes conflicting, opinions about instructing students in different modalities. The participant disclosed that they handled the disagreements through making decisions based on the long-term goals communicated to the community. Participant 1 stated:

Superintendents must set priorities in their work to ensure that everything gets done. I stuck to my roots of “passion and perseverance for meeting long-term goals...How we communicated multiple forms of communication to ensure that everyone within the organization is aware of the organization's goals as well as the progress being made toward those goals. Additionally, superintendents must

align individual and department goals with district goals so everyone is working toward the same goal... The pandemic changed decision-making processes and forced me to recalibrate what information was used to influence stakeholder perspectives.

4.3.5 Addressed Inequities in Learning

One outcome of going through the transitions in learning modalities that affected the improvement of students' test scores was addressing the inequities in learning. Addressing inequities included the continuous offer of hybrid learning modality. Participants 1 and 2 explained that with a hybrid setting, students can learn with flexibility to accommodate the inequities they experienced. Participant 2 shared, "Similarly, Students who were quarantined could stream in, so they wouldn't fall behind. Also, if students were absent for a particular activity—field trip, band trip, overnight trip—and still receive instruction from the teacher, remotely." Participant 2 also perceived that the future of education would inevitably include online classes. Implementing hybrid learning modality would prepare their students for academic success in any learning modality, which could address inequities in college readiness. Participant 1 believed that having online and hybrid classes helped students gain the 21st century skills they would need to succeed in college and in their future careers. Participant 2 shared:

We now have a blended system – work collaboratively together to build a blended stage. College landscape is changing drastically. Predictions are far more online and hybrid learning. We have to ensure our students are prepared for these types

of learning models as students will encounter them moving forward as they are preparing for college and career readiness.

The three participants perceived that the outcomes of the transition to online learning resulted in improvements to their technology resources which allowed for the continuation of hybrid classes despite having the option to return to traditional face-to-face classes. Participant 1 shared:

A best practice we exhibited was ensuring everybody has devices and access to Internet and connectivity was certainly a factor in providing all students with equitable access... We [made] sure they had access that was equitable based on their abilities and not just a take it or leave it approach.

Participant 2 described that class sizes tended to be smaller in online and hybrid settings. The smaller class size addressed inequities experienced by students with special needs. Participant 2 stated, “Small class sizes and more targeted instruction for special education students.”

4.3.6 Integrated Technology and Improved Instruction Delivery Using Virtual Platforms

The participants shared that the transition to online and hybrid classes resulted in better acceptance of non-traditional learning modalities and utilization of technology tool for education compared to the attitudes and practices before the pandemic. Participant 3 explained:

I mean, it was again, of course there were some parents that were pushing, saying if you can do one day you can do it, but they didn't understand that. It wasn't an

instructional thing that was making us go hybrid. What was making us go hybrid is because of the social distancing.

Adapting hybrid and online classes also provided students with flexible learning options. Participant 1 shared that students can continue to learn remotely and enroll in courses offered by other institutions which could improve their future prospects.

Participant 1 shared:

It creates a more flexible learning environment for students and gives them options as we a small rural district have limitations to what classes we can offer.

We now offer and share courses with other school districts that lead to pathways.

Within the district, the participants shared that the board members became more accepting of using technology tools of education and were willing to allot a budget for purchasing online learning resources. Participant 3 explained:

The experience of moving from traditional, what it did was...it made us come in into where we should have been with technology four or five years ago, so that'll never go away...On the virtual days...we probably do more of that now in our buildings than we did because we see that, hey, this works. And now we got these devices, I can take four or five kids back here and we can do something with a reading lesson or whatever. And the rest of these kids can complete something that I've assigned with them in the learning management system or online research.

Participant 3 also shared that the veteran teachers became more tech savvy as a result of the transition to online and hybrid learning and receiving professional development. Participant 3 reported:

They were good teachers, but they're better teachers now because they had to learn how to use technology. They had to learn how to send the lesson home and to do it electronically and virtually during that time frame and the other thing and I think that again, this is to me just another silver lining in the cloud.

4.4 Summary

The purpose of the quantitative causal comparative study was to examine the impact that hybrid modality of learning had on third grade reading EOC scores during the 2020-21 school year in public elementary schools in South Carolina. A total of 1,455 student data were included in the analyses. About 57% of the student data were from hybrid schedule students and 43% of the student data were from traditional schedule students. The ELA scores were not normally distributed as observed from the results of the Shapiro-Wilk's test. Therefore, Mann-Whitney U test was conducted. The result of the Mann-Whitney U test determined that the hybrid schedule students have significantly higher mean scores than traditional schedule students. Further analysis indicated that hybrid schedule students have significantly higher mean scores than traditional schedule students specifically for male, female, and White students.

CHAPTER 5

FINDINGS

The purpose of this quantitative study was to examine the impact that the hybrid modality of learning had on third-grade reading EOC scores during the 2020-21 school year in the setting of a public elementary school in South Carolina. This study examined whether third-grade students' reading performance, as measured by the SC READY ELA assessment, varied as a function of student's enrollment in a district using a hybrid modality of instruction as compared with a traditional modality during the 2020-2021 school year.

This study was guided by the following research question and a null hypothesis: What is the difference in third-grade reading performance, as measured by the SC READY ELA assessment, for students enrolled in a district using a hybrid modality of instruction compared to students enrolled in a district using a traditional modality during the 2020-2021 school year? Quantitative data for this study included the schedule type (i.e., traditional or hybrid), gender, race, giftedness, setting (i.e., special education or non-special education), and the ELA scores for a total of 1,455 students. Additional data for this study were collected qualitatively from three individual interviews with three superintendents of school districts in South Carolina. The three participants were asked about their experiences during the transition from traditional face-to-face classes to fully

online classes to hybrid and return to face-to-face settings during the school year 2020-2021 to the ongoing school year 2022-2023. Analysis of the data in this study was conducted using descriptive and inferential statistics.

Key findings of this study include gifted students and special education students did no better in hybrid vs. traditional settings. However, male, female, and White students performed significantly better in hybrid settings than in traditional settings. Qualitative data revealed that superintendents and other stakeholders struggled with hybrid transitions. These findings match the quantitative results, showing that students with low academic achievement in traditional settings performed similarly in online settings. This study also found that changes in the responsibilities of parents and teachers at the time of this research presented new challenges and opportunities.

5.1 Interpretation of the Findings

This section will present the results of this quantitative causal-comparative study in light of the scholarly research from Chapter 2. New research will also be presented to contextualize and expand on the implications of the findings. The results will be presented both quantitatively and qualitatively. Also, recommendations, implications, and limitations will be presented.

5.1.1 Quantitative Findings

The range of scores for the hybrid was 148 to 825 while the range of scores for the traditional was 163 to 679. Mann-Whitney U tests were conducted to test the null hypotheses posed in the study regarding the difference in mean ranks of ELA scores

between hybrid and traditional schedules. The results showed a significant difference in mean ranks ($Z = -4.553, p < .001$). The results showed that hybrid participants have a higher mean rank as compared to traditional participants (Mean Rank = 670.21). This finding was significant enough to reject the null hypothesis.

The results of this study showed that there is no significant difference in mean ranks of ELA scores between special education hybrid and traditional schedule participants. This may be due to special education students experiencing extra support during the shift to online classes. While these students experience inequalities related to the physical capacity to utilize technology tools, less access to these tools, difficulty communicating virtually, and less parental support for this method, educators helped them overcome these limitations (Angelone et al., 2020; Bülow, 2022; Flynn-Wilson & Reynolds, 2020; Shamir-Inbal & Blau, 2021; Zydney et al., 2019). Attempting to address these inequalities, one participant stated, “[We are] making sure they had access that was equitable based on their abilities...[through] instructional continuity plan with curriculum designs, plans for access to devices and connectivity, and supports for parents and teachers that are activated whenever needed.” This finding shows a high level of engagement and strategic planning on the part of the educators involved in this study.

A Mann-Whitney U test was conducted to determine whether the ELA scores were significantly different between hybrid and traditional schedules for male students. The result showed that there is a significant difference in mean ranks of ELA scores between male hybrid and traditional schedule participants ($Z = -3.228, p = .001$). The male hybrid schedule students have significantly higher mean ELA scores than male traditional schedule students as indicated by the higher mean rank value of 394.84. This

was found to be the same for female students and concurred with interview participants not referencing gender as part of the attributes that may have influenced ELA scores in both hybrid and traditional settings.

A Mann-Whitney U test was conducted to determine whether the ELA scores were significantly different between hybrid and traditional schedules for Black students. The result showed that there is no significant difference in mean ranks of ELA scores between Black hybrid and traditional schedule participants. This finding does not align with the findings many other studies present, as African-Americans consistently experience widening achievement gaps when instruction is moved online (Dorn et al., 2021; Goldhaber et al., 2022; Ong, 2020). The consistently widened gap in achievement in online education for minority students is correlated with a lack of personal interaction and attention from instructors and peers (Baum & McPerson, 2019). Also, a lack of access to and knowledge of digital tools is another component of consistent educational disparities (Ferri et al., 2020).

These elements were also substantiated in this study by Participant 1, who reported no problems with students having devices to use for online classes, but being in a low-income rural district, some students experienced problems with internet connectivity. While these elements are a large issue nationally, they may have been less relevant in the population included in this study as only one participant acknowledged minority racial groups' risk of experiencing inequities in online learning. Participant 1 shared that high-achieving learners “tend to be minimally affected by online schooling; students who do fine anywhere tend to do fine online. The online penalty is more severe for vulnerable and struggling students-students with low prior achievement or from

disenfranchised ethnic and racial groups.” This perspective reflects an observant and reflective understanding of the nuances that support student achievement. What is needed to address this disparity in minority/low-income student outcomes are the same strategic planning and parental involvement that special education students received in this study. This was done in part by educators using federal funding to purchase digital devices for online learning for those who did not have them.

5.1.2 Qualitative Findings

Supporting the quantitative findings, the qualitative findings emphasize that the hybrid approach supported the integration of the best of what the traditional setting had to offer mixed with technological tools supporting enhanced instruction. Contributing to improved test scores in the hybrid setting, this environment was found to foster greater collaboration, innovation, and engagement compared to the environment of the traditional educational setting. As participant 2 stated, “By combining the best of traditional classroom practices and instructional technology tools we can create a powerful learning experience for students that foster collaboration, innovation, and engagement.” Student engagement is one of the most critical aspects of academic success (Bergdahl & Bond, 2022; Olivier et al., 2019).

While parents were expected to help students with their online classes, many parents did not do this. Without parental support, the challenge of engaging students in online classes was considerable. Participant 2 stated, “The inability to engage students in an online environment was one of the most significant challenges our teachers encountered while transitioning to online learning.” Finding ways to improve student

engagement in both traditional and hybrid learning environments will have lasting value for all educational contexts. One of the benefits of the hybrid approach is that teachers are tasked to plan the face-to-face instruction such that when students were in online sessions, they can do the work and learn independently. Learning independently is one of the skills needed for tomorrow's successful workers to adapt to a vastly changing economic landscape and has been shown an attribute of blended learning (Geng et al., 2019; Ra et al., 2019).

This study found that students with low academic achievements tended to struggle in online settings. However, this may be due to contextual and environmental factors rather than purely intellectual ones. Lower-achieving students may not have access to the technology tools their higher-achieving peers may be given access to. Also, struggling students may not receive the parental support at home that their higher-achieving peers may be experiencing (Agostinelli et al., 2022). When these factors are combined with the impact of stress in the home, privacy, diet, and the other myriad factors that virtual learning from home contributes, the outcomes of relying on technology become less clear.

This study found that changes in the responsibilities of parents and teachers at the time of this research presented new challenges and opportunities. During the pandemic, superintendents were asked to shift their focus entirely away from pedagogic concerns to fulfilling the minutia of pandemic-related tasks. This left many educators without the support they needed to navigate the transition in ways that most supported their students. Participant 2 shared, I was “reading about things like community spread, viral transmission, social distancing guidelines, and quarantine guidance?... We had to learn

new skills with rapid adjustment that attributed to the pandemic as well as the new learning the pandemic demanded in their work.” This finding echoes the assertion that the future economy requires individuals who are constantly learning and adapting to new challenges (Ra et al., 2019). This study illustrates how the demands create by constant change impact leaders’ capacity to maintain a connection with their followers. Even when quarantine was over and the hybrid method of face-to-face plus virtual was in place, Participant 1 remained focused on monitoring the implementation of health and safety measures to prevent the spread of the disease.

The forced change in responsibilities took away the focus on teaching students and helping them achieve high test scores. Unable to supervise educators while managing all the demands, superintendents were unable to hold teachers accountable during remote work. Understanding that they were unable to address the socio-emotional needs of teachers and students to continue to support their teaching and learning, superintendents felt increased stress. As a result of this, teacher burnout has increased and teachers report not receiving the emotional support and flexibility they need to cope with the increased requirements of their work (Marshall et al., 2022).

This study emphasized that a school is a vital aspect of the community, not just a place for instruction but a place for emotional and physical support. The theoretical foundation of this study points out that knowledge is individually constructed and socially mediated (Devi, 2019). Hybrid learning methods can balance the individual and social aspects as long as educators are supported both institutionally and socially. Participants shared that at the beginning of the school closure and shift to online learning in 2020, the participants shared that they continued feeding their students and their

families. Providing food for the students and their families was as much of a priority as continuing to provide instruction. This was recognized as a vital need because the parents were not used to or prepared to provide all the meals as they transitioned into having the students at home full time. Recognizing and reacting to this need is one way that schools provide community strengthening and support.

5.2 Limitations of the Study

One limitation of the study is the risk of supporting technology without fully weighing the risk of how technology transforms the learning experience. Researchers emphasize, “Although technologies are physical tools and not theoretical thinking tools or concepts, they change not only the way we carry out a task, but also the way we think about the task” (Raes et al., 2020, p. 15). This limitation of technology must be considered in how it impacts the cognitive processes of critical thinking, innovation, memory, and other aspects vital to self-efficacy in learning. If this limitation is not considered then the short-term benefits of hybrid education may not outweigh the long-term benefits.

Another limitation of this study is that it looked at the period of time at the beginning of the COVID-19 pandemic. This period is not representative of a usual period, but a time of crisis in which aggressive steps were taken to integrate hybrid learning (Dorn et al., 2020; Kaden, 2020). As such, the findings from this study may lose some generalizability as the education culture readjusts to instruction post-COVID. This study reflects the general under-preparedness of the educational community at this time, as expressed by one participant:

Asking school districts, in a matter of a few months, to replace a system of traditional education that has been in place for hundreds of years, is a big task. Because remote or hybrid teaching has rarely existed at all educational levels before, there would have been no reason for an expectation of readiness to flip a switch and begin teaching students through a hybrid or fully remote form.

While today schools are attempting to hybridize in part to be more prepared for possible future pandemic challenges, this study reflects a time period of crisis and stress (Shamir-Inbal & Blau, 2021). This study population may have been ahead of the curve in regards to preparedness, as one participant shared “We were very fortunate that we had already been going one is to one...Already very accustomed to delivering instruction via technology.” This preparedness may have been reflected in the findings that minority students did not struggle when transitioning into online environments, which is not keeping with national data on this population (Dorn et al., 2021; Goldhaber et al., 2022; Ong, 2020).

In addition, this study was limited by the use of secondary data and by the set of chosen variables. The researcher recognizes it is possible that the list of variables is inappropriate or substantially incomplete and may not capture all the elements influencing outcomes. Finally, this study was limited by the potential for researcher bias.

5.3 Recommendations

It is recommended that greater training on the risk of educational disparities for minority populations be done for teaching populations engaging in hybrid learning. While minority populations experience only a widening of already existing disparities when

instruction is moved online (Dorn et al., 2021; Goldhaber et al., 2022; Ong, 2020), only one of the participants in this study recognized this risk. Teacher awareness and teacher bias play a large role in student outcomes, and with lack of teacher interaction being one of the main issues for minorities struggling with virtual tools, this area cannot be overlooked (Baum & McPerson, 2019; Cohen, 2022).

It is also recommended that more research be done on the unique challenges of the rural context utilizing blended learning approaches. This study showed rural locations to be more resistant to the pandemic context that necessitated the online shift. As one participant recalled, “Parents and community members behaved outrageously on social media and at school board meetings...the board members’ own political perspective tended to shape their willingness to close schools or adopt health and safety precautions.” Personal opinion and political leanings cannot dictate school policy that will impact student health and learning outcomes. More research is needed to understand how far-reaching this risk factor remains.

While the challenges of the pandemic helped non-traditional learning modalities be more accepted by parents and board members, the benefits of the approach may not yet be understood by parents. Participant 1 shared that hybrid learning, “creates a more flexible learning environment for students and gives them options as we a small rural district have limitations to what classes we can offer.” However, this does not exempt parents from engaging in their children’s education. Without parental support and engagement, especially in rural locations where a family may share one computer, hybrid approaches may not provide the platform students need to cultivate autonomous learning (Shamir-Inbar & Blau, 2021). Parents, teachers, students, and researchers are debating the

value of online technology to successfully improve the quality and efficiency of teaching in public schools (Baum & McPherson, 2019; Kaden, 2020; Raes et al., 2020a). Parents may provide a necessary missing link for the success of these efforts. If parents are engaged, the context of the school can expand beyond the brick-and-mortar building and into the home in ways that expand the scope of learning.

It is recommended that schools receive more funding, staff, and support to enable the expanded role they perform for the community post-COVID. While schools were always a vital aspect of culture, they now perform more for the community than ever before. As Participant 3 clarified,

The pandemic has really changed who sits at my table when I make a decision. It used to be my principals, finance department, and folks on the operational side. Now, when I make a major decision, I have the county health director on the phone, the nurse is in here, and I have a member of the board who is a family medical doctor.

Acting as guardians and guides for the next generation, educators need greater compensation and a lighter workload to reduce the risk of burnout (Nassar et al., 2019; Santoro, 2020). If educators are not supported, they will be less likely to endure the challenges of the job fulfilling the expanded needs of the community. Community needs are more than ever guiding instruction choices, and this level of reflexivity must be reflected in the financial and personnel support that enables long-term growth. The flexibility that hybrid learning enables can help students become more self-directed (autonomous) and self-motivated, which has positive implications for future economic growth in the information age (Amarin, 2020; Binnewies & Wang, 2019; Bower et al.,

2015; Flynn-Wilson & Reynolds, 2020; Ghazali, 2022; Ørngreen et al., 2013; Singh et al., 2021; Wang & Rasmussen, 2020).

5.4 Implications

One implication of this study is increased support for hybrid approaches to education that maximize the use of technological tools. However, it must be considered carefully the role of technology in the lives, jobs, and learning approaches of tomorrow's students. The fourth industrial revolution and the shift to the future economy will require new skills and new approaches. Researchers emphasize that the occupations of tomorrow may be disproportionately “concentrated in the nonroutine and cognitive category and require skills that cannot be easily automated... skill demands of the fourth industrial revolution requires strengthening learnability – the willingness and ability to learn, unlearn, and relearn – among the current and future workforce” (Ra et al., 2019, p. 26). Thus, more important than maximizing technological tools in the classroom is maximizing a student's capacity to learn.

This implication was supported by this study by the finding that there is no significant difference in mean ranks of ELA scores between gifted hybrid and traditional schedule participants. What characterizes gifted students is not just intellectual achievement, but also corresponding psychosocial capacity and the wide range of environmental context of the home that supports that (Agostinelli et al., 2022; Papadopoulos, 2021). This represents the power of balance to help bring out the best in a student, and such balance is a complex thing to create and support. Gifted students learned just as well in traditional and hybrid environments in part because they are self-

motivated learners who develop innovative approaches to learning wherever they are based on personal interests (Chandra, 2020). This is the skill, self-motivated desire to learn, that is most needed in today's students to meet the needs of tomorrow's dynamic economy. This implication is supported by the finding from Participant 1, who shared the belief that regardless of the setting, students can achieve "similar levels of academic success" provided that teachers utilized the best practices in using technology tools.

This implication expands the capacity for educators to help students become lifelong learners adept both in traditional pedagogy and best-evidenced-based technological applications. However, research has shown that today's educators are lagging behind students in technological capacity and information literacy (Beatty, 2019; Bülow, 2022; Flynn-Wilson & Reynolds, 2020; Garzón-Artacho et al., 2021; Kundu et al., 2021; Ørngreen, 2015; Shamir-Inbal & Blau, 2021; Zydney et al., 2019). This finding was substantiated in this study, as Participant 1 experienced a challenge in preparing and supporting the teachers for online teaching and using online learning platforms, as not all teachers were proficient in the necessary technologies. This implication was also supported by the finding that superintendents in this study used Google Suite and Video conferencing programs at the beginning of the transition to give staff a chance to be trained on the remote instruction platforms. From this initial training, the staff was led into more complex technology tools, and then finally into the socio-emotional training for how to manage students in a hybrid context. This study did find that the challenges of the pandemic transition to hybrid learning increased educator technological fluency a great deal.

A balance must be struck between capable educators utilizing the best pedagogic foundation in traditional education while applying technology appropriately in hybrid learning contexts (Sulistiono, 2019). More research is needed on the contextual factors that support students' self-motivation to apply these elements to all students whenever possible (Nortvig et al., 2018). Participant 3 shared their experience of utilizing hybrid technologies enabling them to “take four or five kids back here and we can do something with a reading lesson or whatever. And the rest of these kids can complete something that I've assigned with them in the learning management system or online research.” This type of flexibility allows educators to teach students at different levels of their capacity and can help gifted students move faster and independently of overall class speeds.

Prior research has shown that students enrolled in hybrid learning develop greater autonomy and self-organization skills (Flynn-Wilson & Reynolds, 2020; Ørngreen et al., 2013; Raes et al., 2020a; Singh et al., 2021; Wang & Rasmussen, 2020). However, more research is needed to determine if these outcomes are the same if the student enters into hybrid learning by choice or by necessity as was the case in the pandemic context. One of the largest benefits of hybrid learning is the capacity for autonomous learning, which has been shown to improve student outcomes, promoting self-discipline, and lifelong learning skills (Ghazali, 2022; Xie & Yang, 2020). These are some of the most necessary aspects of future workers, and a greater focus is needed on how to increase autonomous motivation in students.

The theoretical foundation of this study, cognitive constructivism developed by Swiss psychologist Jean Piaget (Devi, 2019), emphasizes that individuals are active participants in learning (Doolittle & Camp, 1999; Ekpenyong, 2018; Piaget, 1954;

Sipanovic & Perganits, 2018). As such, successful hybrid learning must provide opportunities for students to participate in the development, planning, and application of the hybrid pedagogic approach. However, this study revealed one possible hurdle to this aim, which is educator bias. Participant 2 believed that only gifted students tended to do well in any setting, which was a belief this study refuted. This belief may negatively impact their capacity to teach non-gifted students and undermines the value of each individual student regardless of their perceived intellectual capacity, socio-economic status, or race (Cohen, 2022). The power of bias may be much more influential on student outcomes than traditional versus hybrid classroom applications.

One implication of this study is to heighten awareness of the different characters and challenges the rural community presents for education. This study found educators challenged by the community character of their rural location, which was one of independence of mind, going their own way, and resisting governmental interference. Parents resisted school closures and distancing requirements during the pandemic, and resistant parents are less likely to support their students academically. Parents and educators need to be on the same page sharing the same goals to support students during times of crisis and/or transition (Wang et al., 2021). This is especially true in a rural location that experiences heightened educational disparities for a wide range of reasons (Herold, 2020).

An implication this study emphasized is that when disruptive changes occur the impacts may be long-lasting, impacting all stakeholders in myriad ways. For example, even when quarantine was over and the hybrid method of face-to-face plus virtual was in place, Participant 1 remained focused on monitoring the implementation of health and

safety measures to prevent the spread of the disease. The forced change in responsibilities took away the focus on teaching students and helping them achieve high test scores. If this type of distraction occurs, a new position may need to be created to take on these specific requirements so that superintendents can refocus on educators, parents, and student needs.

Superintendents and school-board members report that pre-COVID they were able to do their job from 9 to 5 on a normal weekday, but that post-COVID the job has expanded to a 24/7 requirement (Capullo, 2021). This change piggybacks on the changes in hybrid education which present unique threats to the well-being of both students and teachers. Challenges of isolation and mental exhaustion are a result of loss of face-to-face interactions inherent in the virtual tools (Abi Raad & Odhabi, 2021; Bower et al., 2015; Chemi, 2020; Chen et al., 2018; Green et al., 2020; Rambøll, 2020; Smith et al., 2020; Singh et al., 2021; Wang & Rasmussen, 2020; Yang et al., 2020; Zydney et al., 2020; Zydney et al., 2019). If this continues unabated, it will most likely lead to an increase in superintendent/principal/board member/teacher burnout (Marshall et al., 2022).

5.5 Conclusion

This study provided insight into the time of crisis the pandemic created that forced pedagogic transitions away from traditional learning and into hybrid learning due to distancing requirements. This is a process that was slowly underway mostly in higher education but was quickly forced into practice in an attempt for public safety. This study emphasized that this transition forced superintendents to focus more on bureaucratic

requirements than on the socio-emotional needs of educators and students. This left a vacuum of support for teachers that was felt by students who were struggling with the new format and the stress of the pandemic. In this effort, parents were not as helpful and on board as they could have been.

A greater synergy of communication and strategic vision, as well as engagement, is needed between superintendents, educators, students, parents, and the community if the benefits of hybrid learning are to be maximized. Schools are being asked to fulfill a wider range of responsibilities in their communities but are not being given the necessary funding and personnel support they need to fulfill these roles without risk of burnout. The lessons learned from the pandemic must translate into policy improvements that take a long view for educators as well as students. In this long view, parents must play a more active and supportive role if students will be prepared to rise to the challenge of the future economy.

APPENDIX

LETTER TO DISTRICTS

Dear Superintendent,

My name is Paul Spadaro, and I am a doctoral student at Coastal Carolina University. I am conducting a research study to examine whether using a hybrid learning modality during the COVID-19 pandemic was associated with students' third grade reading scores.

I am writing to request permission to conduct my study using deidentified third grade student data from the 2020-2021 school year. Specifically, I am requesting to receive the following data for each third grade student:

- SC READY ELA EOC scores
- Race/ethnicity
- Free or reduced lunch status
- Special education status
- Gender

I would use these deidentified data to determine whether student performance on EOC assessments varies as a function of whether their district used hybrid or traditional scheduling during the COVID-19 pandemic.

No identifying information related to the district or any of its students will appear in the dissertation manuscript or in any subsequent publications related to the study.

Thank you for your consideration of my request, and please do not hesitate to contact me at **864-323-2964** for any questions.

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