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The Journal of Epistemology - The Theory of Knowledge
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EDITORS

Dr. Nathan Herzog
Dean of School of Education

Dr. Pam Castleman
Associate Dean of School of Education Graduate Studies

JESSUP UNIVERSITY SCHOOL OF EDUCATION GRADUATE FACULTY

Dr. Nathan Herzog
Dean, School of Education

Dr. Pam Castleman
Associate Dean, School of Education Graduate Studies

MAT PROFESSORS

Mr. Kaden Bahner
Mr. David Bills
Dr. Pam Castleman
Ms. Lari Miller Powell
Dr. Hervey Taylor
Mr. Matthew Taylor
Dr. Wendy Westsmith

RESEARCH MENTORS

Dr. John Burch
Dr. Pam Castleman
Dr. Elizabeth Lynn
Dr. Jeffrey Mrizek



Dr. Nathan Herzog
Dean of School of Education

Journal of Epistemology: Education as a Quest for Truth

We are all on a journey, a quest if you will. Some journeys improve our reality, and others might harm us. Our educational institutions should continually study themselves to help those engaged move closer toward an improved reality. What if all of our institutions adopted the idea that they were on a quest for Truth? We believe that a key role of educational institutions in society is to help the population acquire knowledge and arrive at a more clear picture of the Truth. Have educational institutions considered what knowledge is, what the sources of knowledge are, and how to validate knowledge effectively? Join me on this intellectual, philosophical, and empirical journey on a quest for truth to improve the application of knowledge in our educational systems at all levels.

Welcome to the Journal of Epistemology, a scholarly platform dedicated to advancing our understanding of the Theory of Knowledge within the realm of educational research and theory. In this scholarly endeavor, we aim to unravel the intricacies of knowledge within educational contexts, examining how the educational landscape shapes the pursuit of truth. At the heart of our thematic focus lies the conviction that education serves as a catalyst for understanding knowledge's nature, sources, and validity. We also acknowledge that the only knowledge worth investing in is that which guides us to a deeper understanding or clarity of truth. The classroom, the lecture hall, and the research laboratory become crucibles where ideas are forged, challenged, and refined. In exploring the symbiotic relationship between knowledge and the quest for truth. The better we understand how learning environments mold and shape the minds of learners, the more effective our systems will be at applying the epistemological theory of knowledge.

Purpose of the Journal

Epistemology, a cornerstone of philosophical inquiry, delves into the essence of knowledge, posing fundamental questions that challenge our understanding of reality. What is the nature of knowledge? What are the sources of knowledge? What determines if knowledge is valid? Theoretical and empirical investigations of educational communities are appropriate studies that will accomplish the purpose of this journal. These inquiries lie at the heart of our scholarly pursuits within the Journal of Epistemology. Addressing these questions will help us build effective learning environments that guide us all closer to the truth.

Exploring the Nature of Knowledge

The Nature of Knowledge, a thematic focus of this journal, engages with intricate queries that have captivated the minds of philosophers for centuries. Here, we scrutinize the foundations of reality and probe into truth's relative and absolute aspects. As we embark on this intellectual journey, we aim to cultivate a comprehensive dialogue across disciplines, welcoming contributions from education researchers who seek to unravel the mysteries surrounding the nature of knowledge.

Unraveling the Sources of Knowledge

The quest for knowledge encompasses a diverse array of sources, ranging from empiricism and revelation to authority, reason, and intuition. We recognize that many institutions and individuals use a variety of sources to acquire knowledge. The Journal of Epistemology serves as a conduit for scholarly exploration into these sources, fostering a rich tapestry of research that illuminates the origins and pathways through which knowledge is acquired.

Validating Knowledge: Theoretical Perspectives

The validation of knowledge introduces another layer of complexity, and our journal invites rigorous investigations aligned with key theoretical perspectives. Whether through the Correspondence theory, the Coherence theory, or the Pragmatic theory, researchers are encouraged to contribute insights that shed light on the intricate processes through which knowledge is validated and deemed trustworthy. Researchers should use theoretical frameworks anchored in learning or educational theory.

Conclusion

As we embark on this scholarly expedition, the Journal of Epistemology invites researchers, educators, and philosophers to engage in a collaborative discourse that transcends disciplinary boundaries. By fostering a nuanced understanding of the Theory of Knowledge within the context of education, we aspire to contribute meaningfully to the broader academic landscape and propel the dialogue on epistemology to new heights.

Join us in this intellectual odyssey as we explore the essence of knowledge, its diverse sources, and the intricate theories that underpin its validity. Together, let us cultivate a community of thinkers dedicated to unraveling the profound mysteries of epistemology.

Call for Submissions

We warmly invite submissions from researchers, educators, and philosophers across all educational environments. Whether your expertise lies in preschool, primary, secondary, or higher education, we encourage you to contribute your insights and research findings to this interdisciplinary dialogue. Together, let us unravel the symbiotic relationship between education and the timeless pursuit of truth, contributing to a deeper understanding of the epistemological foundations that shape our worldview.

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The Montessori Method: An Exploration of the Impact of the Montessori Method on the Academic Success of Elementary Students with Attention Deficit Hyperactivity Disorder

Kathy Conkle Barnes

Abstract

This research looks into whether Montessori's significantly different approach helps or hinders the outcome of elementary students with Attention-deficit Hyperactivity Disorder (ADHD). The Montessori method, with educational programs for children from birth to 18 years old, is an alternative to traditional methods in public and private schools worldwide. ADHD is one of the most common childhood neurodevelopmental disorders. Elementary school educators need to understand how to recognize ADHD, for early interventions, and to understand the instructional needs of these children for best outcomes as the child grows. By being informed about and equipped with tools to identify and support students who have ADHD, elementary school educators, along with the students, their families, teachers, and remediation professionals, can be part of successful support to help. This project investigated Montessori Methods, ADHD in students, and relevant overlapping data to discover that a Montessori education is an appropriate place for students with ADHD to learn. The study's implications addressed suggested policies and practices for districts, schools, and educators to follow. In conclusion, a Montessori education was found to be supportive of both neurotypical students and students who have been diagnosed with ADHD alike.

Chapter 1: Introduction to the Project

Sometimes, elementary school teachers can feel like they are playing a real-life board game called Boosts and Barriers. In this challenging game, teachers look for ways to boost their diverse learners to help them reach their learning goals while dodging and evading barriers. Teachers try different practices and hope their students will move forward rather than run into obstacles that can cause them to lose a turn or even slide backward. For an added challenge, a dice throw of the student's circumstances, genetics, physiology, or neurology can affect their behavior and how they move forward in their learning. For example, an abundance or lack of love, sleep, nutrition, stress, trauma, socioeconomic status, and if they have bonus barriers based on the functioning of their bodies or brains can all affect how students progress in school (Yang, 2023). In this hypothetical game, the elementary school teacher's edition of Boosts and Barriers, the student has a specific brain-based challenge called Attention Deficit Hyperactivity Disorder (ADHD) that brings extra barriers to their ability to learn and pay attention, making it more challenging for

them to move forward. What if the teacher could switch out the game board? Would a different pedagogical method make the game easier?

Background

Students in elementary school who are struggling with brain-based challenges, such as Attention Deficit Hyperactivity Disorder (ADHD), may find it difficult to make progress academically and behaviorally in school (Low, 2024). Schools and families search for alternative and equitable teaching modalities to meet the needs of diverse learners. Parents, teachers, and schools search for different philosophical and pedagogical choices as an opportunity to consider different school matches for their kids. To answer this search, some private, charter, magnet, and public schools teach in educational modalities that offer an alternative to traditional public schools. Montessori is one such method. In fact, the number of public Montessori schools is expanding, and is currently the largest group of progressive schools in the public school choice sector in the United States (Debs, 2019).

Maria Montessori's method of teaching is an alternative to the traditional model. It varies from the traditional methods in many ways; for example, Montessori encourages teachers to follow the child's lead. Montessori believed that children are actively and intrinsically motivated learners that a teacher guides rather than believing that children are empty vessels into which the teacher pours knowledge. In Montessori's ideal classrooms, the teacher guides students in their learning rather than act as a font of knowledge that supplies students with their learning. Students move around the environment to work where they choose, for example, at tables or on rugs, not at assigned desks. The students choose what they will work on and for how long (Lillard, 2016).

Dr. Maria Montessori was born in Italy in 1870 and became a scientist, medical doctor, and world-famous educator. She was one of the first female medical doctors in Italy. She worked in pediatric medicine before developing her educational philosophy and model with special needs and low-income children. Her methods are based on scientific observation of the development of children in a school environment. Montessori recommended allowing children freedom of movement and activity within a prepared classroom environment, free choice of educational materials, and periods of self-directed and uninterrupted student work time (Lillard, 1996).

Today, the Montessori method is practiced in public and private schools worldwide, with programs for children from birth to 18 years old. According to the National Center for Montessori in the Public Sector (2023), there are over 15,000 Montessori schools worldwide and over 3,000 Montessori schools in the United States, including over 570 public Montessori schools. Montessori programs are the largest group when considering alternative educational model options in public schools in the United States (Debs, 2019). With a growing number of Montessori programs available, it is beneficial to understand both the advantages and disadvantages of such a program compared to more tradi

tional teaching models. The National Center for Education Statistics (2023) reports that, in the 2021-2022 school year, there were 52,450 elementary schools in the United States, excluding California. Although Montessori schools account for less than 6% of schools, it is worth looking into how well the method serves its attending students. Montessori's methods differ from other teaching models in many ways. These differences must be considered to understand best practices for teaching students with neurodiversity. This research seeks to answer whether Montessori's significantly different approach helps or hinders the outcome of elementary students with ADHD.

The medical community classifies ADHD as a mental disorder, but the condition is more compassionately considered neurodiversity by those within the ADHD community (Kocsis, 2013; Low, 2024). The Diagnostic and Statistical Manual of Mental Disorders, 5th Edition, (DSM-5), defines mental disorders as "clinically significant cognitive, emotional regulation, or behavior disturbances that reflect dysfunction in psychological, biological, or developmental mental function processes" (DSM-5, 2022; Kocsis, 2013). The Centers for Disease Control and Prevention (CDC) {2024 a.} notes that one of the most common childhood neurodevelopmental disorders is ADHD. The CDC estimates that almost 11% of the United States population, ages 3 to 17, have been diagnosed with ADHD, not counting undiagnosed students. ADHD may hinder the mental health, academic, and behavioral success of students who have it (Bitsko, 2022). The American Psychiatric Association also notes that it is common for neurodivergence and neurodevelopmental conditions to occur together. For example, children diagnosed with ADHD frequently experience challenges related to specific learning. Thus, children with ADHD often have a concurring specific learning disorder such as dyslexia (Luna, 2024). Further, other behavioral and mental disorders co-occur with neurodevelopmental disorders in children. For example, ADHD may also be present in a child along with anxiety disorders or oppositional defiant disorder (DSM-5, 2022.)

Therefore, this topic has relevance to the field of education because the educational community, professionals, legislators, and families want children to mature into content, functioning, and contributing citizens to the best of their ability and are all affected by the prevalence of ADHD.

Statement of the Problem

Considering the overlap of data shows that Montessori programs are the largest group of alternative educational options in public schools in the United States, and more than 1 in 11 children are diagnosed with ADHD, it is important to address whether the academic outcomes of elementary students with Attention Deficit Hyperactivity Disorder (ADHD) are positively supported in a Montessori education (Debs, 2019; Centers for Disease Control and Prevention, 2024 a.).

According to CHADD (2017), a national support organization for Children and Adults with Attention-Deficit/Hyperactivity Disorder, ADHD

is a potentially severe, treatable disorder that is both legally and medically recognized. ADHD is also common; it is diagnosed in 11% of all children, approximately 4% of adults, and possibly many more who are undiagnosed (Centers for Disease Control and Prevention, 2024 a.). It is crucial for educators to understand the legal aspects of working with children with learning disabilities, and therefore ADHD, in a classroom. The United States has federal laws that entitle eligible students with disabilities to accommodations and special educational supports. In the report, A Guide to Disability Rights Laws, the United States Department of Justice (2020) explains the three federal laws that apply: the American Disabilities Act (ADA), the Individuals with Disabilities Education Act (IDEA), and Section 504 of the Rehabilitation Act of 1973 (U.S. Dept. of Justice Civil Rights Division, 2020). All three of these federal laws are in place to help ensure that students with disabilities receive an education that supports them in the best way possible. In addition to their motivations and considering these laws, education communities, school districts, teachers, and families search for best practices to support diverse needs in inclusive classrooms.

Montessori programs present an alternative model for an inclusive learning environment for children with disabilities (Long et al., 2022). Part of Montessori's educational premise is that independence and self-determination help to build the ability to focus, perhaps supporting students with ADHD (Lillard, 2019). The century-old Montessori method has persisted and is admired for its broad scope, effectiveness (supported with evidence), and alignment with research with developmental studies in education and psychology (Lillard, 2019). Researchers found that using Montessori-designed materials methods and teaching activity-based lessons that include hands-on manipulatives are thought to be helpful practices for students with disabilities such as ADHD (Gkeka et al., 2018). In addition to activity and manipulative-based lessons, Montessori recommends freedom of movement for students within the classroom environment, a practice recommended for special education and beneficial for young students with ADHD (Akkerman, 2014; Gkeka et al., 2018). Despite its benefits, the Montessori method has not been considered an educational option by many because it can be offered without fidelity, and the Montessori method does not follow the same testing structures and standards as conventional education (Lillard, 2019). Thus, districts, teachers, and parents may be reluctant to try or trust Montessori's methods. Looking at how academic outcomes of students with ADHD differ in a traditional classroom versus a Montessori classroom will help determine whether it is worthwhile to create, pursue, or enroll in a Montessori program for elementary school.

Purpose of the Project

This inquiry also fits into a larger developmental context of searching for the best practices to support the academic success of elementary students who have ADHD. Answering this question can help students with

ADHD and their families when they are deciding what would be the best-fit school for their child or children. Additionally, local schools, states, and national educational funding and curriculum decisions can be informed by considering evidence-based best practices to support neurodiverse students.

This problem requires understanding the Montessori method and how ADHD affects an elementary student's behavior and academic performance. This project will explore how the Montessori teaching model is used in elementary schools, and how it affects the learning experiences of students with ADHD and their neurotypical peers. This will highlight the unique challenges and opportunities within the educational framework.

Theoretical Framework of the Project

Maria Tecla Artemisia Montessori was born in Italy and lived from 1870 to 1952. Jean William Fritz Piaget was born in Switzerland and lived from 1896 to 1980. Montessori and Piaget were almost contemporaries interested in understanding and supporting children's learning and developmental processes. Piaget studied and responded to the work of Montessori and built on her ideas (Mooney, 2013). Both Piaget and Montessori believed that a child was an active participant in constructing their own learning. They also both felt that a teacher must carefully observe and listen to a child to understand their development (Mooney, 2013).

Piaget's theory of cognitive development dovetailed with Maria Montessori's theories of development. Through scientific observation, both Montessori and Piaget identified that children go through stages of development. Piaget theorized that children develop in four stages (Ojose, 2008). The first stage, called the sensorimotor stage, was from birth to when language appears. In this stage, children experience the world through their senses and through what they can move towards, and in this period, the child develops object permanence. Next is the preoperational stage when children develop symbolic thought, increased ability in language, limited logic, and an egocentric perspective. Stage three was the concrete operational stage, when cognitive growth accelerated, language development and acquisition of basic skills and operations such as classification and ordering of concrete objects happened. Hands-on activities are especially important in the concrete operational stage to support cognitive development. Finally, children reach the formal operational stage, which is when a person developing hypothetical, abstract, metacognitive, and scientific reasoning. Montessori identified what she coined, "planes of development," that humans grow through in six-year spans that further break in half into three-year sub-groupings. Montessori (1949) explained her observations in this way:

I have found that in his development, the child passes through certain phases, each of which has its own particular needs. The characteristics of each are so different that certain psychologists have described the passages from one phase to

another as 'rebirths.' (p.32)

Montessori describes the First Plane as lasting from birth to 3 and from 3 to 6; during this plane, children develop their absorbent mind, personality, and physical and biological independence. In these years children answer the question, "What is that?" The Second Plane is from 6 to 9 and 9 to 12, when a child's mind and personality continue to develop with mental independence. In these years, the child asks, "Why or how is it?" The Third Plane is adolescence, which follows in the years 12 to 15 and 15 to 18 while the child develops social policy and independence. In the Third Plane, the child answers, "Who am I?" The Fourth Plane is from 18 to 21 and 21 to 24, when a child fully matures into an adult with spiritual and moral independence. In these years, the individual answers the question, "What will I do?" (Montessori, 1971).

Piaget believed that children developed in two ways: through nature (their biological influences) and nurture (their environment) (Piaget, 1954). He also believed that children supported one another in their learning through peer interactions (Ojose, 2008). Montessori also supported multi-age classes because she believed learning from people of different ages was natural. In 1950, Montessori published *The Absorbent Mind*, in which Montessori wrote:

Our schools have shown that children of different ages help each other; the little ones see what the older ones are doing and ask for explanations, which they gladly give them. It is a real lesson since the mentality of the five-year-old is so close to that of the three-year-old that the little one quickly understands from him what we would not be able to explain to him. There is harmony and communication between them, as is very rare between adults and small children. [...] There is a natural mental osmosis between them» (Capobianco, 2021; Montessori, 1950).

Piaget also believed that children should be able to check their work, reflect, and reason so that they can discover ideas through investigation (Piaget, 1970). Montessori also believed that a child's work should be self-corrected so that the learning itself offers immediate feedback to the child about their understanding.

Definition of Key Terms

Attention Deficit Hyperactivity Disorder/Attention Deficit Disorder(ADHD/ADD): a neurodevelopmental disorder that can be exhibited in a child as an inability to pay attention, move more actively than typical, trouble controlling impulsive behaviors, and occasionally as cognition and social differences (Centers for Disease Control and Prevention, 2024 b).

Children and Adults with Attention-Deficit/Hyperactivity Disorder(CHADD): The Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD) is a national information and support organization based in the United States and publicly funded in part by the Centers for Disease Control and Prevention (CDC) (Centers for Disease Control and Prevention, 2024 b).

Elementary-aged children: in the United States, elementary school consists of Kindergarten through fifth or sixth grade and is for children ages four to twelve (National Center for Education Statistics, 2021).

Neurodevelopmental: the way in which the brain develops and grows (Centers for Disease Control and Prevention, 2024).

Neurodevelopmental Disorders: are a group of disordered conditions that typically begin early in development. These conditions are characterized by deficits or impairments in brain processes that result in differences in academic, social, or emotional functions (American Psychiatric Association, DSM-5 2022).

Summary

This research seeks to determine whether the Montessori teaching method supports the academic outcomes of elementary students with Attention-Deficit Hyperactivity Disorder (ADHD). The research will consider students of elementary age with ADHD who have been diagnosed by professionals or identified by parents and enrolled in a Montessori so that the study may investigate students' resulting academic and behavioral success or progress, using Piaget's Theories as a supportive framework. The educational community, professionals, legislators, and families affected by the prevalence of ADHD want children to mature to the best of their ability, and thus, understanding if teaching methods make a difference can be helpful information for those making decisions about educational models.

In Chapters Two and Three, the research will seek to answer these questions: What does data say about the achievement of lower elementary students in Montessori classrooms? How do Montessori methods impact elementary students' academic achievement? Do the strategies and structure of the Montessori methods and pedagogy help or hinder the educational growth of students with ADHD? First, literature will be investigated to set a foundation of understanding in these themes: Maria Montessori and her methods, how to recognize and support students with ADHD, what the legislature says about public education's obligations, and why it is important to support students with learning barriers. Next, the project will look at overlaying these themes to see where there are boosts and barriers for students with ADHD in the Montessori Method. Finally, the literature will be synthesized to see if elementary school Montessori classrooms are appropriate places for students with ADHD to learn, grow, and thrive.

Chapter 2: Review of Related Literature

Introduction

Neurodiverse elementary students with Attention Deficit Hyperactivity Disorder (ADHD) may be attending or considering schools with different pedagogical approaches. Public Montessori schools, currently the largest

group of progressive school options in the United States, present an alternative model for an inclusive learning environment for children with disabilities (Long et al., 2022; Debs, 2019). This inquiry searches for the best practices to support the academic success of elementary students with ADHD and considers whether a Montessori education is appropriate for students with ADHD. This project will review the literature to consider how the achievement of lower elementary students is affected in Montessori classrooms. A fuller investigation of the research topic can be understood by considering the foundations and history of both Montessori and ADHD.

Origins of Maria Montessori and her Methods

Maria Montessori (1870–1952) was an innovator of pedagogy who developed a method for teaching children different from anything of her time period (Kramer, 1976, 1988). The American Montessori Society (AMS) tells her story that at age 13, she entered an all-boys school because she wanted to be an engineer (AMS, n.d.). Through further study, she changed her path and overcame many obstacles to become one of the first female doctors in Italy in 1896. As a physician, she worked in the field of psychiatry. Montessori became interested in educational theory and pedagogy and began questioning the methods used to teach children with developmental and intellectual disabilities. In 1900, as co-director of a new special education teacher training institute, Montessori observed and experimented in search of the best teaching methods. Her program was deemed a success when many students who were not expected to be able to learn made gains (AMS, n.d.). In 1907, in an inner-city, low-income district of Rome, Montessori opened a full-day childcare center for youth ages three to seven called the Casa dei Bambini, or, in English, The Children's House. The previously under-served students did well in Montessori's program. Word spread; by 1910, Montessori schools were being opened in Western Europe and worldwide. The first one in the United States opened in New York in 1911 (AMS, n.d., Kramer, 1976, 1988).

In her many books and recorded speeches, Dr. Montessori explained her method as encompassing a broad curriculum, a whole-child pedagogy, and a prepared learning environment, all based on her philosophies and observations of child development. Her approach to education was original and significantly different from the traditional classrooms of her time (Kramer, 1976, 1988). For example, Montessori's educational method considered children to be individuals in their own right, not miniature adults (Povell, 2018). The Montessori curriculum covers mathematics, language arts, science, history, social and cultural studies, and more. (Culclasure et al., 2018). It combines observational and activity-based learning, rooted in an exploration of and interaction with hands-on manipulatives, with a transition from concrete to abstract work (Bridges Montessori, n.d.; Randolph et al., 2023). Montessori's pedagogical approach to teaching and learning respects the whole child by honoring where

they are developmentally with an overarching goal to prepare children to live peaceful, productive, and fulfilling lives as active citizens in their communities. Similar to Piaget's stages of development, Montessori identified what she called planes of development in children. She built her curriculum to be appropriate and respectful of the learner's plane of development, their developmental stage, and interests, designing child-sized and beautiful manipulatives, environments, and lessons that sparked interest and further study (Lillard, 2016). As with Piaget's construction of knowledge, the Montessori curriculum is planned across age spans so that learner's knowledge and skills are developed coherently, such that each new learning builds upon what was learned previously and integrates across subject matters (Ó Siochrú, Ó. S. 2018, Lillard, 2016).

Montessori endeavored to design a suitable learning environment for including children with neurodiversity because, historically, Montessori developed her methods to address the unmet educational needs of cognitively challenged or delayed and underprivileged children (Long, 2022). A contemporary of Montessori, Anna Freud, described her as being motivated to improve children's lives, especially those disadvantaged by their economic circumstances or physical constitution (Kramer, 1976, 1988).

Montessori's method highlighted children's inner curiosity and need for peace and independence (Leibowitz, 2022). Her approach was anchored in living in peaceful harmony with oneself and others and with respect and responsibility for nature and the world. Montessori's commitment to peace grew as she lived through the horrendous conflict and crisis of two world wars (Kramer, 1976, 1988). Her experiences shaped her educational methods and held a vision of children as future citizens, thus key to the future of our world, long-term global peace, and societal reform.

Analysis of Montessori Method's Foundational Principles

The American Montessori Society (n.d.) lists foundational principles essential to quality Montessori programs, whether public or private: fully-trained Montessori teachers, multi-age classrooms, use of Montessori-developed materials, student-directed school work, and students have uninterrupted periods of work time during the school day. Teachers are trained and certified in Montessori methods, so they fully understand Montessori theory, philosophy, and materials. Classrooms are multi-age, so children can learn from each other and experience new challenges learning through observation and cooperation. Children who have mastered concepts can teach others, thereby reinforcing their own learning, developing leadership skills, and serving as role models. Children learn cooperation rather than competition by working and socializing with others of differing dispositions, abilities, and ages. Classrooms use Montessori-designed materials that teach incrementally and sequentially, one skill or concept at a time until mastered. The classroom environment is organized and prepared so that learning and work can be child-directed and

within which students may move and explore — while also being respectful and productive. An uninterrupted work period is when students select and work on jobs and tasks at their own pace. The work period is meant to recognize intrinsic motivation and to help develop concentration and independence.

Jean Piaget

The early twentieth century saw many great minds, in addition to Montessori, who researched child development and considered how and why learning and education impacted children. For example, Jean Piaget contributed significantly to developmental psychology and profoundly influenced our understanding of cognitive development. Born in 1896, Jean Piaget is known for his developmental cognitive theory, which identifies the idea of constructivism in that we constantly construct knowledge (Lloyd, 2018). Further, it argued that we can understand how knowledge is built by conducting empirical investigations to determine the conditions under which knowledge acquisition occurs. Piaget's theory can be applied to children with ADHD by understanding the conditions under which learning occurs so that educators can construct instruction and environment so that a child with ADHD can build knowledge (Folquitto et al., 2014). For example, by Piaget's theory, if we can study and understand how knowledge is acquired, we can use that information to help further a child with ADHD who may struggle in a school environment

Recognizing and Diagnosing ADHD

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder characterized by common traits in diagnosed students, including impulsivity, hyperactivity, persistent inattention, and sometimes cognitive and social functioning differences (McDougal, 2023). For example, if the brain is a race car, then ADHD has been metaphorically compared to altering the car's braking and steering capabilities (Hallowell & Ratey, 2021). Thus, support and treatments for individuals with ADHD can help them to improve control and regulate the speed of their thoughts and the navigation of the winding curves of their emotions. Alternatively, a brain influenced by ADHD can be a curious butterfly that flits from thought to thought, not staying in one place for too long. A student who has ADHD and its possible coexisting conditions may be affected in their ability to function across the many settings of their life (their home, friends, school, and community), and even may place them at risk for adverse psychosocial and health outcomes as they mature into adulthood (Barbaresi, 2020).

ADHD has been discovered to affect an individual's executive functioning. The brain's executive function helps one to be independent, self-organized, autonomous, and goal-oriented (Folquitto et al., 2014). With deficits in executive functioning, such as attention, behavior, and effortful control, students with ADHD are less likely to have strong self-regulatory skills (Ramos et al., 2022). Additionally, depending on the individual's socialization and

experience, executive functions influence a student's emotional regulation and self-control (Folquitto et al., 2014).

Diagnosis of ADHD

As a group, students with ADHD have been shown to have reduced performance in school (Rigoni et al., 2020). Depending on which symptoms are present when diagnosed, there are currently three ways ADHD can be identified: predominantly hyperactive-impulsive type, predominantly inattentive type, or a combination of inattentive and hyperactive-impulsive symptoms (CDC 2024 b., Irinyi, 2015). Symptoms can change as children grow and develop. For example, symptoms might increase when stress increases. The lesser-known subtype, called ADHD-Inattentive (ADHD-I), does not include hyperactivity as one of its traits (Irinyi, 2015). The differing symptoms of ADHD can impact school outcomes in different ways. For example, students with the ADHD-Inattentive type received a school-based Individualized Education Program or 504 Plan significantly more often than students with other ADHD subtypes (Rigoni et al., 2020). This is important to realize so that the other symptoms don't go unnoticed.

Table 1-1 includes a list of indicators of behaviors, social and emotional skills that may indicate making a referral to a medical professional for considering an ADHD diagnosis:

Table 1-1: *Indicators for Referring for ADHD*

Behaviorally	Socially	Emotionally
Short attention span	Immature social skills	Easily angered, moody, irritable
Hyperactive motor behavior	Relates better to younger children	Unable to control impulses
Poor control of impulses	Difficulty developing friendships	Highly anxious
Excessive talking	Difficulty with complex games	Immature social skills
Disturbing others	Plays too aggressively	Frustrated
Daydreaming or Frequently distracted	Poor decision making skills	Low self-esteem
Seldom sits still	Difficulty with siblings	Rapid/drastring mood changes
Frequently misplacing personal items	May not have to follow house rules	Outbursts of temper
Difficulty following/ understanding directions	Parents have difficulty accepting child's difficulties	
Difficulty completing & turning in work	May be punished often	

Note: Table 1-1 adapted from Irinyi, M (2015), *How Montessori Helps Teachers Understand & Work with Students with ADHD* Retrieved from: <https://montessoritraining.blogspot.com/2015/03/understanding-working-adhd-montessori.html>

The United States government's Centers for Disease Control and Prevention, CDC (2024b.) explains that there are many traits that may be an alert that an ADHD diagnosis should be considered, such as a student who shows impulsivity, distractibility, and hyperactivity, observed over at least six months and across different settings. Other traits that may signal ADHD are a student who has difficulty attaining or sustaining attention or following directions (it may appear that they are not listening), disorganized with materials/misplaced or lost things, consistently incomplete work or jobs, impatient when waiting for their turn or to get attention; a student who is in constant motion, they can be extra talkative, distracted easily, interrupts others, forgets routines, daydreams often, or avoids sustained effort (Rolfe, 2023). These traits, in varying levels and combinations, can make it difficult for a student with ADHD to progress academically. ADHD can manifest with varying severity. For example, about six out of every ten children diagnosed with ADHD have moderate to severe symptoms (CDC, 2024). The American Montessori Foundation (AMF, n.d.) notes that educators must be knowledgeable about how students are affected by ADHD so that they may support them appropriately (Stern, n.d.). AMF and Stern (n.d.) also stress that while educators should be in contact with parents about behaviors they observe, they must refrain from diagnosing students.

It is worth mentioning that children are affected by an ever-changing myriad of influencing factors, everything from the microscopic (how neurons fire within a student's brain) to the local (their families' and schools' philosophies and cultures) to the cosmic (their individual and personal experiences within our world and on our planet). When considering the list that indicates a student has ADHD, it is also important to recognize that the risk factors for the symptoms listed can have other antecedents, such as trauma, not getting enough sleep or proper nutrition, and more (O'Neill et al., 2017). Thus, having ADHD is not the only factor in how children represent themselves at school. Also, a student who has the associated behaviors doesn't always have ADHD. Further, examining all of the factors of childhood behaviors would be a course of study beyond the scope of this research. Using Piaget's theory of constructivism as a framework for understanding is helpful in supporting students with ADHD (Folquitto et al., 2014). For the purposes of this paper, we will limit the scope to focus on the traits of ADHD, tools, and methods that can help these children learn, and whether a Montessori education is appropriate for students with ADHD.

Changes in ADHD Prevalence and Recognition Over Time

The CDC (2024 b.) notes that ADHD is one of the most common childhood neurodevelopmental disorders. Using data from 2022, the CDC estimated that 11.4% (seven million) of the United States' children, ages three to seventeen, have been diagnosed with ADHD (CDC, 2024 a., Bitsko, 2022). This is a 14% increase from 2016, when one million fewer children were diagnosed. A decade earlier, data from the National Survey of Children's Health (NSCH) between 2003 and 2011 showed an increasing trend in diagnosed students through parent-reported data about the prevalence of youth aged 4-17 diagnosed with ADHD by a healthcare provider in the United States. For example, the NSCH showed that the prevalence of children ever diagnosed with ADHD increased by 42% between 2003, when it was 7.8%, and 2011, when it was 11.0%. The survey also consistently showed that between 2003 and 2011, females were diagnosed less often than males (Visser, 2014).

According to the CDC (2024 a.), 77.9% of students who have been diagnosed with ADHD have also been diagnosed with at least one other co-occurring condition or concern, such as behavioral problems, anxiety, depression, and more. Of the children with ADHD, 50% had regulation, conduct, or behavior problems, and about 40% had anxiety. There is little data to estimate how many students have ADHD but are undiagnosed; however, it is safe to say that there are students in this category, considering that the numbers of children diagnosed with ADHD have risen steadily as physicians, parents, and educators become more educated and as the symptoms are better understood (Stern, n.d.).

Whether or not a student receives an ADHD diagnosis and or treatment can vary depending on where the student lives. The CDC notes that diagnosis can vary regionally from 6% to 16% across the different states. In addition, treatment, such as medication or behavior therapy, can range across states from 58% to 92% of diagnosed children receive treatment. The American Academy of Pediatrics (AAP), the largest United States professional association for pediatricians, recommends a treatment plan combining medication and behavioral therapy for children six and up (Wolraich, 2019). Of students who have been diagnosed with ADHD, almost 25% had received neither medication nor behavior therapy as a treatment for their ADHD symptoms (Wolraich & Hagan, 2019).

ADHD Diagnosis and Treatment by Demographics

Looking at data on ADHD diagnosis and treatment, researchers Morgan and Hu found there were sociodemographic disparities in elementary children in the U.S., specifically that black boys and emergent bilingual children were underdiagnosed compared to white children. In addition, they also found that when treating ADHD, emergent bilingual children and girls were not as likely to have been prescribed medication. The authors suggested that to lessen dif-

ferences in early ADHD diagnosis and treatment, there should be continued sensitivity to biological, cultural, and linguistic factors and that linguistically diverse families should have access to available care (Morgan, 2023).

Disability Rights Legislation

The United States has federal and state laws to ensure equitable and inclusive educational rights for all. This is especially important for students with conditions, such as ADHD, that disable them or cause them to have specific needs that are outside the realm of typically developing children. The legislation has changed over time as an understanding of disability and mental health has evolved through research, activism, and education.

History of Disability Rights Legislation in the United States

In 1975, the United States enacted the Education of All Handicapped Children Act (EAHCA), which implemented special education services in public schools. Notably, the EAHCA was the genesis of the Individual Education Program (IEP), which states the individualized services and needs of each student eligible for special education in public schools (Swain et al., 2022). The EAHCA was updated and renamed to The Individuals with Disabilities Education Act (IDEA) in 1990 and again in 2004. The IDEA requires public schools to make free appropriate public education (FAPE) available in the least restrictive environment appropriate to the individual needs of all children with eligible disabilities (Swain et al., 2022). The IDEA lists 14 categories of particular learning disabilities that should be provided with free and appropriate public education. However, ADHD is not listed as a distinct category; instead, ADHD is considered under the category of other health impairments (Yell, 2019). The IDEA also stipulated that FAPE meant that special education services would be under public supervision, funding, and direction and free of charge; meet the State's educational agency's standards; include an appropriate preschool, elementary, or secondary school education; and conform to the student's IEP.

Individual Education Program (IEP)

The IDEA stipulates that eligible students with a disability are entitled to an IEP that outlines the details of specialized educational accommodations and support services customized to that individual's needs (U.S.D.J., 2020). It is important that special educator administrators and teachers understand and follow the requirements of the law when writing and implementing students' IEPs to ensure that their IEPs avoid both process and content errors (Rozalski et al., 2021). To ensure appropriate services, an IEP is developed collaboratively by a team of knowledgeable persons, which includes the student's teacher, parent(s)/guardian, an agency representative who is qualified to provide or supervise the provision of special education, and other individuals at the

parents' or agency's discretion, and, if determined appropriate, the child themselves (U.S.D.J., 2020; Yell, 2019). Another law, Section 504 of the Rehabilitation Act of 1973, can be used when a student does not qualify for an IEP but would benefit from accommodations (U.S.D.J., 2020). The U.S. Department of Education (2022) explains that parents who choose to enroll their children with disabilities into a private school (and FAPE is not contested) do not usually have an entitlement to federal funding for related services and special education they would receive at a public school or if their child was placed in a private school by the local educational agencies (LEA) in order to meet FAPE. Also, depending on their State's laws, a private school may not be required to meet their State curriculum or personnel standards.

Even with the IDEA and FAPE in place, disputes would occur over what was included in an equitable and inclusive education (Rozalski et al., 2021). In 2017, the Supreme Court of the United States ruled on *Endrew F. v. Douglas County School District*, which involved Endrew F. (Drew), who had been diagnosed with both autism and ADHD. In short, the case asked for clarification on what level of educational benefit should be expected from FAPE required by IDEA; it further suggested that the previous *de minimus* expectation was unacceptable. A *de minimus* expectation meant that the threshold that showed the expectation was met was that it was better than nothing. For example, if the educational benefit was minimally better than no education, it satisfied the law. Drew's family argued that the *de minimus* standard for FAPE should be overturned. In its ruling, the Supreme Court set a new standard that requires that IEPs be reasonably designed to enable students to have educational benefits that support progress in school as appropriate, considering the student's circumstances (Endrew, 2017; Yell & Bateman, 2019). The ruling increased expectations beyond *de minimus* such that school districts must offer an IEP that is reasonably written to make progress possible within the student's circumstances.

Today, to best support students and ensure that IEPs avoid both process and content errors (and thereby avoid litigation), special education professionals, administrators, and teachers must understand and follow the law's requirements when writing and implementing students' IEPs (Rozalski et al., 2021). Further, to adhere to the law, all involved should have the training, skills, and knowledge to help them differentiate instructional strategies and effectively implement the accommodations and modifications that are specified in students' IEPs (Yell & Bateman, 2019).

Universal Design for Learning

Founded in 1984, the Center for Applied Special Technology (CAST) introduced UDL, a conceptual structure that makes learning more inclusive and equitable. UDL promotes intentionally designed learning experiences that highlight strengths and remove barriers for all students. The premise is that

all students within a class may benefit when support and accommodations for students who need special accommodations are applied and offered universally in the classroom and not only to a select few (CAST, n.d.). The CAST researchers formed the basis of their educational initiatives with principles that aim to provide students with multiple means of representation, expression, and engagement. Montessori believed experimentation and observation would benefit all education, so she designed many UDL supports into her method (Rosati, 2021). Self-directed movement, child-sized furniture, respect for children as a unique individual, and active, independently driven participation are all examples of UDL-supportive features designed into Montessori classrooms and methods.

Review of Studies and Anecdotal Evidence on Montessori Outcomes

The research examines whether Montessori education supports student outcomes. One more extensive study conducted a meta-analysis of the effectiveness of traditional education compared to Montessori education in improving academic and nonacademic outcomes, as well as the degree to which other factors (such as grade level, Montessori public compared to Montessori private setting, etc.) affect Montessori effects. The researchers found that the Montessori method outperformed traditional education in many academic and nonacademic outcomes (Randolph et al., 2023).

Comparative Performance Metrics: Standardized Tests, Grades, etc.

Proficiency on standardized performance tests is one metric that can be used to measure whether a school program is performing well. However, standardized performance metrics for private Montessori schools are difficult to find because private schools that charge tuition and do not rely on state or federal funding are not required to administer state tests (Snyder et al., 2022). In the United States, some public schools offer programs that teach in progressive modalities, and charter, magnet, or district schools can offer an alternative to traditional public schools (Snyder et al., 2022). The number of public Montessori schools is expanding, and it is the largest group of progressive schools in the public school choice sector (Debs, M. 2019). Even so, the research did not find statistics that address Montessori schools as a complete nationwide set.

A team of researchers headed by Randolph (2023) conducted an extensive meta-analysis of qualitative and quantitative studies to compare non-academic (creativity, social-emotional, and executive function) and academic outcomes in both Montessori and traditional educational models in schools. The researchers investigated 19 academic databases to find 2,012 relevant articles, which they winnowed down to 32 articles for their meta-analysis. These 32 studies yielded 204 effect sizes across 132,249 data points, 91 nonacademic and 113 academic, showing sufficient evidence that the Montessori model

outperformed traditional education in various outcomes. The studies considered the effectiveness of traditional education compared to Montessori education in improving academic and nonacademic outcomes and the degree to which other factors (such as grade level, Montessori public compared to Montessori private setting, etc.) made a difference. The researchers found that the Montessori method had modest, meaningful effects and outperformed traditional education in many academic and nonacademic outcomes (Randolph et al., 2023).

Another metric to consider in a successful school system is diversity and equality. The student populations in Montessori schools were mixed; one study found that overall, the Montessori population was less diverse and slightly wealthier. However, most of the public Montessori schools were Title 1 schools, which means that a certain percentage of low-income students qualify for free or reduced lunch (Debs, 2019).

A large mixed-method study between 2011 and 2016 involved over 7,000 children in 45 public schools in South Carolina, including traditional and charter public schools. It comparatively examined many aspects of public Montessori schools, including the demographic makeup of the student populations and the academic, behavioral, and affective outcomes. The demographics of these school students showed that 10% were Hispanic, 34% were black, about 55% were white, and 10% had a special education designation, similar to other South Carolina public schools. (Culclasure et al. 2018).

Case Studies and Anecdotal Evidence

To gather a full picture of an educational method's outcomes, one must also look beyond standardized test scores; qualitative impacts must also be considered. Factors such as student engagement, motivation, and independence are difficult to measure quantitatively but matter nonetheless. School goes far beyond academic learning, and it is important to consider how the Montessori Method can impact elementary students' achievement in other areas, such as executive functioning, creativity, work habits, and social skills.

Students' Executive Functioning, Creativity, Work, and Social Skills

Montessori programs may present a suitable learning environment for including children with disabilities because Montessori teachers use activities and hands-on lessons with concrete teaching materials. For example, Montessori materials for activity-based instruction that include hands-on activities are considered an essential practice for students with ADHD (Gkeka, 2018).

In a small qualitative study, researchers interviewed elementary school students with ADHD and their teachers. They found that the students had a limited understanding of ADHD and that students felt like they did well in PE class but that they were challenged by focusing and writing. The teachers said they thought that their student's strengths were movement, imagination, and

creativity and that the students' challenges in the classroom were their self-confidence and ability to pay attention. In addition, when the students' teachers were interviewed, it was found that the teachers had a varied understanding of ADHD (McDougal, 2023).

The Montessori pedagogy included grace and courtesy lessons, explicitly teaching social-emotional behaviors. In these lessons, children developed body control and congruent attitudes in social situations and interactions to learn to act appropriately and peacefully in the community with others (Gentaz & Richard, 2022). Over four years, researchers in South Carolina gave direct assessments of executive functioning and found mixed results: public Montessori students generally performed better than or similar to non-Montessori students (Culclasure et al., 2018). Direct assessments of creativity showed Montessori students scored higher levels than traditional students did in creativity measures, however, when measured for work habits or social skills, the two groups had no consistent differences.

The Montessori method may support the educational and social progress of differently-abled children, such as those with ADHD (Pickering, 2017). Current research is showing that the brains of students with ADHD are not inferior to neurotypical brains but rather have different strengths and weaknesses; for example, students with ADHD may struggle with executive functions such as prioritizing and organizing; however, they also may be especially creative. ADHD has traits that can become assets once a person learns to control them (Hallowell & Ratey, 2021). For example, curiosity, creativity, tenacity, and persistence are all traits of ADHD that, depending on how they are expressed, can be deficits or assets.

Montessori believed that children could learn to direct their attention in a concentrated and sustained way, which would self-foster positive learning developments (Lillard, 2016). One cross-sectional study analyzed Montessori education's impact on students with ADHD regarding the perceived level of academic performance and learning, self-efficacy, reactivity, behavior, and psychological development (Eşi, 2024). A positive impact was shown on various aspects of the development of children with ADHD in the areas of better academic performance and social interactions, satisfactory classroom behavior, and adaptation to the school environment for those students with ADHD in Montessori programs. However, the study found that the results for measured variables were not uniform, and the aspects of self-efficacy and emotional self-regulation did not show significant differences between traditional and Montessori programs. The researcher also noted that students with ADHD may have individual behavior management and specific learning needs, so the study called for more nationwide research with higher sample sizes.

Montessori Classroom Practices and Management Strategies

There are many classroom management strategies that are part of the Montessori Method that have been proven to be supportive of students with ADHD. Practices such as activity-based instruction, hands-on activities with concrete tools, freedom of movement in the classroom, belief in a student's intrinsic motivation, a prepared environment, explicitly teaching mindfulness, grace, and courtesy are evidence-backed practices that are also part of the Montessori Method.

One critical supportive practice for students with ADHD is activity-based instruction, which includes hands-on activities, such as Montessori materials and lessons (Gkeka et al., 2018; Long, 2022). Freedom of movement in the classroom has shown benefits for children with ADHD and is a practice recommended for special education by the Division for Early Childhood (DEC, 2014; Akkerman, 2014; Gkeka et al., 2018; Long, 2022).

Another practice Montessori developed by observing children was explicitly teaching about silence, concentrating during work, and including practices to help children recognize their mental attention with a sense of self-awareness and nonjudgment. Montessori encouraged a meditative state, emphasizing uninterrupted and intense concentration during quiet work periods (Povell, 2018). Empirical studies of mindfulness-based therapies have shown improvements in executive function among elementary-aged children (Ramos et al., 2022). One study of traditional elementary school classrooms assessed student perceptions before and after a ten-week mindfulness unit. It showed lower scores for friction and competitiveness and higher scores on cohesion and satisfaction scales reported for students who had mindfulness lessons than those who did not (Meyer & Eklund, 2020). However, a study that focused specifically on students with ADHD did not find a statistical benefit to the use of mindfulness-based training in the classroom as a supplement to behavioral treatment (Ramos et al., 2022). However, Ramos et al. noted that achieving sustained changes in the executive functions, behaviors, and mindfulness of students with ADHD may require longer-term interventions than the scope of the short-term study.

Another supportive practice is that intrinsic motivation is practiced through self-directed activities. Montessori believed that students were naturally driven to learn and guided to work by intrinsic or internal desire and motivation. She discouraged external rewards in the form of prizes or positive praise from the teacher, proposing that offering such extrinsic motivation or rewards would diminish internal motivation and render the child reliant on external motivation and validation. A sense of autonomy and self-direction were factors in increased intrinsic motivation (Murray, 2011). In fact, researchers Yang, Chui, et al. (2022) found that self-determination played a notably significant role in the engagement in learning of students with special needs.

Classroom environment and its impact on focus and behavior

ADHD is genetically inherited and can be epigenetically influenced, meaning that the environment can impact the expression of the genes (Hallowell, 2021). Researchers found that too much environmental visual stimulation in a classroom had a negative impact on students' attention regulation (Godwin et al., 2022). Godwin et al. highlighted Montessori and Reggio Emilia as pedagogical approaches that prescribe neutral classrooms designed with minimal decorations while also noting that in the United States, it is more common to find highly decorated classrooms.

Benefits of Movement in a Montessori Classroom

Piaget (1970) stated that action boosts development and that a child's interactions with objects can lead to progressively more complex learning (Folquitto et al., 2014). Montessori also believed that the mind and body worked in concert. For example, in the Montessori pedagogy, cognition and movement interweave, and thus, learning and thinking can be enhanced by movement (Lillard, 2016). During quiet work periods, children choose what to work on and where in the classroom to work. Research into the impact of self-directed movement on a child's ability to focus found that movement activities provide students with breaks that allow them to focus more on their lessons after the break (Akkerman, 2014). In a Montessori-designed classroom, shelves are prepared for self-directed work. Akkerman found that movement shelves, which included a variety of prepared movement lessons, for example, yoga cards and hopping lessons for use during the work period, provided movement that helped students have an increased ability to focus for more extended periods, lessened behavior problems, and improved physically, socially and cognitively.

Criticism of the Montessori Method Suitability for Students with ADHD

Some researchers listed fidelity to Montessori's methods as an inconsistent factor or independent variable of their research. Schools are considered to have fidelity to the Montessori model if they implement the Montessori principles, including multi-aged groupings, using Montessori materials and manipulatives, teacher assessment of students through observation, Montessori accreditation of school-site, and Montessori credentialing and training of teachers and assistants (Snyder et al., 2022). However, Montessori did not trademark her method, nor was there a prescriptive definitive list of what must be included to qualify a Montessori school. Therefore, implementing the basic foundational principles can vary from school to school.

It is indicated that the administrators and teachers may not feel prepared to support students with ADHD. For example, research that interviewed Montessori school administrators and teachers showed that ongoing and enhanced professional development was a top choice for supporting students with disabilities (Long et al., C. 2022).

Updating an Old Method

In 2015, the executive director of the American Montessori Society (AMS), Richard Ungerer, reflected that in the many decades since the AMS's founding, there has been a need to expand upon the method that Montessori designed in the early 20th century to incorporate differing cultures and new ideas, innovations and resultant insights and opportunities from the latest research and advances in technology. Ungerer's comment is even more relevant today, post-pandemic, considering how Covid changed how technology is used in schools.

Summary of the Review of the Literature

Different pedagogical approaches, such as a Montessori-style education, were considered for neurodiverse elementary students with Attention Deficit Hyperactivity Disorder (ADHD). Many practices and ideas support the academic success of elementary students with ADHD, and data shows that a Montessori education was appropriate for students with ADHD.

In this research, many articles were investigated, covering several key issues related to how the pedagogy of Montessori affects students with ADHD. There is an interrelationship between the student and the pedagogy they are learning, which is complicated because each person is an individual. The literature provided an understanding of the Montessori pedagogy and its philosophical and practical applications. It also provided information about teaching, learning, social, and behavioral mechanisms leading to academic growth in children with neurodivergencies, specifically ADHD. Researchers have realized the challenges of teaching or being a student with ADHD and have put forward reasonable suggestions for support and structure. The information obtained from these studies could be helpful in informing educational policy, planning supportive strategies, and designing and implementing appropriate, targeted interventions to help support learning and reduce behavioral problems in children with ADHD. The information obtained from these studies could also be synthesized to see that a Montessori education can be a supportive place for students with ADHD to learn, which may include confidently considering the Montessori pedagogy as a helpful alternative to traditional elementary school.

Chapter 3: Implications

Introduction

This chapter situates the study by reviewing the history, methods, and foundational principles of Montessori education alongside the history and foundations of diagnosing and treating children with ADHD and merging these interrelationships with data from the literature. To understand public school's responsibility to instruct students with ADHD, the literature was also

also reviewed to understand the legal obligations set by the legislature for supporting students with ADHD within public school settings. Students with ADHD may be considering and attending schools with pedagogical approaches that are different than traditional ones. This inquiry searched best practices to support the academic success of elementary students with ADHD to find that a Montessori education is appropriate for students with ADHD. The literature review revealed that the academic performance of lower elementary students is positively impacted in Montessori classrooms (Culclasure et al., 2018; Eşi, 2024; Pickering, 2017). Exploring the foundations and history of both Montessori education and ADHD revealed similarities between best practices for supporting neurodiverse students and the Montessori Method. Thus, the review indicated that the Montessori Method could complement the educational experience of students with ADHD. It could also provide a beneficial alternative approach to teaching those who are struggling with ADHD (Culclasure et al., 2018; Gkeka, 2018).

Conclusions

The review of the literature clarified that the Montessori Method does support the academic success of elementary students with ADHD and is an appropriate educational modality for such students (Pickering, 2017; Eşi, 2024). The reviewed data suggests that the Montessori method may offer some advantages when considering the overall statistical outcomes of diverse populations (Culclasure et al., 2018). In conclusion, data shows slight advantages to the Montessori method when looking at the statistical outcomes of general populations. However, most of the studies involved mixed groups and did not specifically analyze the data for students with ADHD. Therefore, more data is needed to understand the academic and social outcomes of students with ADHD in Montessori classrooms. Only a few studies have specifically examined students' experiences with ADHD in Montessori programs. These studies focused on the support available for students with ADHD in a Montessori environment (AuCoin, D. & Berger, 2024; Eşi, 2024; Pickering, 2017).

Practice Implications (Classroom Practice)

The research suggests practices for supporting students with ADHD in elementary classrooms, schools, and organizations. Evidence-based interventions and accommodations can offer proven practices for supporting students with ADHD in elementary classrooms (AuCoin & Berger, 2024; Gkeka et al., 2018; Long, 2022). Many factors are already built into a Montessori classroom, as in Universal Design for Learning (Rosati, 2021). For example, classroom management strategies, including activity-based instruction, freedom of movement, and mindfulness lessons, all help support students with ADHD. For school administrators and teachers to best support their students with ADHD, they need tools and or methods for highlighting the strengths, downplaying the weaknesses, and unwanted behaviors that stu-

dents with ADHD (and others) exhibit that may be a barrier to learning and understanding. Such an approach is also shown to positively impact students with and without ADHD (Ackerman, C. 2018). Recognizing the multiple traits displayed by a student who has ADHD can help clarify what types of support are needed. Each human is a unique individual, and students with ADHD can experience traits at different levels and variations, so a singular solution will not be successful for all students; it is much more complicated than that (Hallowell & Ratey, 2021).

Montessori designed a framework for a supportive learning environment for those with neurodiversity because, historically, she intended her methods to address the unmet educational needs of the underprivileged, cognitively delayed, or challenged (Long, 2022). Montessori's methods to construct knowledge incrementally align with Piaget's theory of constructivism and can be applied to those students with ADHD because by understanding the conditions in which learning occurs, educators can construct instruction and environments so that children can build knowledge (Folquitto et al., 2014). A student is diagnosed with ADHD by common traits, including impulsivity, hyperactivity, inattention, and cognitive and social functioning differences (McDougal, 2023). ADHD affects an individual's executive functioning, which helps students to be self-organized, autonomous, and goal-oriented; additionally, deficits in executive functioning lower self-regulatory skills (Folquitto et al., 2014, Ramos et al., 2022). Unfortunately, this results in reduced performance in school for students with ADHD (Rigoni et al., 2020).

Considering that ADHD is one of the most common childhood neurodevelopmental disorders, educators must have knowledge so that they may support them appropriately (CDC, 2024 b., AMF, n.d., and Stern, n.d.). Intersecting with the knowledge of how to support differently-abled children, the Montessori method may support the student's educational and social progress (Pickering, 2017). One feature, considered an essential practice for students with ADHD, Montessori uses materials for activity-based instruction that includes hands-on activities (Gkeka, 2018). Another practice in Montessori pedagogy that is helpful for children with ADHD is explicit lessons to develop body control and social attitudes so that they learn to act appropriately and peacefully when with others (Gentaz & Richard, 2022). Another Montessori classroom practice that has shown benefits for children with ADHD is freedom of movement in the classroom (Ackerman, 2014; DEC, 2014; Gkeka et al., 2018; Long, 2022). Another practice Montessori developed by observing children was explicitly teaching about silence, concentrating during work, and including practices to help children recognize their own mental attention with a sense of self-awareness and nonjudgment. Montessori encouraged a meditative state, emphasizing uninterrupted and intense concentration during quiet work periods (Povell, 2018).

Policy Implications (Laws/School Policy)

Educators must provide equitable and inclusive education to all students, as mandated by federal and state laws (Swain et al., 2022). In the IDEA, ADHD is under the category of other health impairments (Yell, 2019). Laws stipulate that eligible students with disabilities are entitled to an IEP or a 504 that outlines individualized educational accommodations and/or support services (U.S.D.J., 2020). However, more teacher training about ADHD is needed as it was found that elementary teachers had a varied understanding of ADHD (McDougal, 2023).

In the public school choice sector, Montessori schools are the largest group of progressive schools (Debs, 2019). So, it is important to consider if Montessori is supportive of students with ADHD. A large meta-analysis found that in many academic and nonacademic outcomes, the Montessori method outperformed traditional methods (Randolph et al., 2023). However, Randolph et al.'s study did not separate out students by neurodiversity, so it is not conclusive if the outcome applies equally to those with ADHD. To enroll in most choice programs, parents will need to make the decision to enroll their children, and this can be an argument against offering choice program alternatives (Debs, 2019). However, most of the public Montessori schools were Title 1 schools. A large study of South Carolina public schools showed that the demographics of Montessori school students were similar to those of traditional schools. (Culclasure et al., 2018).

This research study stipulates that school districts, laws, or governments should fund and support Montessori programs as an alternative to traditional schooling, as evidence shows that students with ADHD can thrive in Montessori elementary classrooms. Publicly funded schools should offer alternative pedagogies to traditional models, enabling families and students with differing needs to find supportive learning environments. Publicly funded schools should offer alternative pedagogies to traditional models so that families and students with differing needs can find a place to learn that supports them.

In her day, Montessori observed and experimented in search of the best teaching methods. As she implemented them, her program was deemed a success when many students who were not expected to be able to learn made gains (AMS, n.d.). This study adds to the body of knowledge by showing that Montessori can still be a successful model for a diverse range of abilities in today's classrooms. There are implications for social change that should be considered for tangible outcomes and improvements for individual students who have ADHD, organizations that support those students, and institutions, cultures, and societies who care that their young citizens are educated in a way that does not harm, and in a way that allows those individuals to grow into the best version of themselves regardless of the barrier put before them. This study can contribute to social change by supporting the idea that alternatives to traditional methods may be considered. If a student with ADHD is struggling to

Recommendations for Future Study

Directions arose in the broader literature review discussion for suggested future studies. Several studies referenced had limited sample sizes, so more extensive studies across multiple populations, locations, and demographics would be needed to verify the results for the larger population. This is important because the more comprehensive range and number of students studied can expand the meaningfulness of the research and how applicable it can be in different situations. Some gaps arose in the review of the research and the literature that was studied; for example, future research is needed to get a fuller picture of how well students with ADHD are supported in alternative programs such as Montessori. This study focused on students with ADHD in elementary school. Thus, another question left unanswered in this study is if the benefits of the Montessori Method continue as students age, and if so, is there an age at which the positive effects diminish? Further study into the specifics of why the Montessori Method was successful would be helpful because those methods could be extrapolated and applied to other classrooms that are not interested in adopting the entire Montessori Method. If a practice from the Montessori Method supports a student with ADHD and can be used in a non-Montessori classroom, it would be important to know and share that information.

Summary

The goal of this project was to examine if the pedagogy of Montessori supports elementary students, their families, and teachers who can struggle during the school years because of the challenges of having ADHD. Some struggling students may be considered lazy, hyper, and distracted until someone with specific knowledge or background looks closer to notice that the student's actions and behavior may be affected by ADHD. Once diagnosed, there are many supports of classroom management and setup that can be adopted to help a student who has ADHD. The Montessori Method has many of these supports already built into the Montessori pedagogy. The reviewed literature confirmed that Montessori methods are an appropriate place for students with ADHD to learn. Classrooms should adopt various management ideas and practices from the Montessori Method to support neurodiverse students. School districts and states should support public Montessori Schools so that parents, families, and students have options and a choice for which educational method will be the most supportive.

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Exploring the Impact of Game-Based Learning, Collaborative Learning, and Direct Instruction on Student Engagement in the History of the Classroom

James Ryan Brennan

Abstract

The problem this project sought to address is low student engagement in secondary level history classrooms. This researcher confronted this pervasive issue through an investigation of the following pedagogies: game-based learning, collaborative learning, and direct instruction. The author accomplished this aim through a literature review focused on game-based learning, collaborative learning, and direct instruction, as well the strategies researchers deemed effective for history education. The researcher came to the following conclusions: first, active learning strategies were more engaging than passive ones; second, effective implementation of an approach was an important factor in engagement; third, that context determined whether game-based learning was implemented effectively; fourth, that collaborative learning was similarly dependent on context for effective implementation; fifth, that direct instruction was not as engaging as the other two strategies when used independently. Several implications were determined: first, commercial games should be treated as available assets for teachers to draw on, similar to other media; second, collaborative learning and game-based learning can often be integrated if either is used in the classroom; third, direct instruction should always be used as a part of an integrated approach to keep lessons engaging; fourth, teacher preparation programs should instruct candidates in how to implement a variety of teaching strategies; fifth, more support for game-based learning and collaborative learning is needed; sixth, expanding digital infrastructure and training in the use of digital resources through additional funding before digital game-based learning can be adopted on a large scale.

Chapter 1: Introduction to the Project

Background

If one were to ask the average high school student what they thought about the history classes they have taken, one might often hear descriptive words such as “dull,” “boring,” and “pointless.” History and historical events are anything but boring yet unfortunately, many history courses and curricula in the United States suffer from being distant, unrelatable, and unengaging for a substantial number of students. Any course or lesson has the potential to be unengaging or boring, but history is more prone to boredom than other subjects due to public perception of the subject. For example, in a poll conducted

by the American Historical Association, two-thirds of respondents considered history to be little more than dates, names, and events rather than in-depth discussions about the past (Burkholder, P., & Schaffer, D., 2021).

After COVID-19 wrought havoc on learning environments everywhere in the U.S., many students have since disengaged and do not participate in learning activities. Affective, behavioral, and cognitive engagement fell for students transitioning from traditional in-person schooling to online instruction (Appleton et al., 2023). In general, many students do not feel the content they are taught is relevant to their lives, while others do not care because they feel there are better and more entertaining things to do with their time. Barton et al. (2021) found that students with low social media usage were more likely to have a higher-grade point average (GPA); low attention was also a factor in low performance. It is therefore clear that schools now compete with TikTok, Instagram, video games, and other sources of entertainment for student attention.

One possible way to improve engagement during lessons is to make more engaging content. Existing studies are narrow in scope and do not comprehensively answer this question. An analysis of effective pedagogical approaches for teaching history in an engaging way that does not dilute content rigor is therefore needed, particularly at the secondary level.

Game-based learning grew out of the technological changes that occurred after World War II. The Instructional Design movement introduced technology-based instruction into American schools. In the 1960s and 1970s, some digital educational games were created, such as Oregon Trail (Jaiswal, 2021). However, the study of “serious games,” or games purpose-built solely for education, only began in earnest after the year 2000. The large-scale use of digital game-based learning was only possible after the rise of digital infrastructure during the 1980s and 1990s (Jaiswal, 2021). It was Prensky (2013) who originally coined the term “digital game-based learning” in 2001, long after the first so-called “educational games” were created. While game-based learning exists both within and outside the digital sphere, the extensive study of game-based learning rose with the advent of digital games.

Direct instruction developed earlier relative to game-based learning. The set of instructional strategies associated with this approach grew out of the formal Direct Instruction framework developed by researchers in the 1960s to improve language, reading, and math skills at the elementary level (Stockard et al., 2018). After direct instruction proved to be successful, the methods were adopted at higher grade levels and eventually became associated with formal scripted programs, designed in ways that reflect extensive quantitative research (Stockard, 2021). Teachers are assumed to be the arbiters of new information through constant positive reinforcement, giving immediate feedback on student responses. Direct instruction rests on the assumption that if students do not learn, the fault is in the conduct of instruction.

Collaborative learning was developed along an albeit slightly later timeline compared to direct instruction. However, it is still older than game-based learning. While there is no universal definition for collaborative learning, several aspects of the approach are present in most models (Bruffee, 1984; Bruffee, 1993; Gratton, 2019; Laal & Laal, 2011; Lopez-Pellisa et al., 2021; Ruder et al., 2021; Yang, 2023) such as (a) small-group work, (b) open-ended tasks, (c) loose structure, and (d) high levels of peer interaction. Iterations of modern collaborative learning began in the 1960s, with scholarly research investigating the approach beginning in the 1970s (Yang 2023). Bruffee (1984), himself the leading American theorist in collaborative learning, traced the history of method to a group of British teachers and medical educators in the 1960s. Their desire to “democratize” education and abolish “socially destructive authoritarian social forms” was politically motivated; collaborative learning emerged from that movement, being later supported by evidence collected by scholars such as Bruffee (1984; 1993) who only sought to evaluate the pedagogy’s effectiveness. Today, collaborative learning is one of many different teaching approaches used by schools around the world.

Statement of the Problem

The problem this project seeks to address is low student engagement in secondary level history classrooms. While the goal of lessons and learning activities is for students to be engaged and learn, many students do not meet expectations for various reasons. Schnitzler’s et al. (2020) study found several student engagement patterns in classrooms at the high school level, and that student engagement could take many forms. One notable result from the study was that 37% of students were “disengaged,” while a further 20% were “compliant” during lessons. Disengaged students did not participate and were not cognitively nor emotionally engaged; compliant students participated in class but were not cognitively nor emotionally as engaged as the other subgroups. These results mean that 57% of students in Schnitzler’s (2020) study were not engaged. Low engagement in turn increases the chance students will drop out of school, as engagement is associated with performance (Lamote et al., 2013; Lei et al., 2018; Szabó et al., 2024). To combat issues of dropout rates in secondary schools, educators must seek out ways to improve engagement. Increasing engagement during lessons through improved teaching practices should be investigated as a means of addressing this problem.

Student engagement is too broad a concept to be measured with any consistency. Wong et al. (2024) asserts “student engagement” is a meta-construct consisting of three dimensions: affective, behavioral, and cognitive engagement. Cognitive engagement represents student investment in academic performance, their goals and aspirations, and lessons which require mental effort and the use of their cognitive abilities (Wong et al., 2024). If cognitive engagement could be increased, then student achievement may be positively affected.

Student engagement is one of the keys to improving student achievement. While student engagement both in and out of the classroom declined after schools shut down during the height of the COVID-19 pandemic (Apleton et al., 2023), improving student engagement back to pre-pandemic levels has not been a penultimate goal. Teachers should always do their best to engage students cognitively as much as possible during lessons to improve deep understanding of taught content and critical skills. Both game-based learning and traditional approaches such as direct instruction have merit as effective instructional methods when used appropriately. However, there exists no comprehensive answer to the question of which method results in higher student engagement for history/social science students. A thorough investigation into the respective impacts of game-based learning, collaborative learning, and direct instruction on student engagement is therefore necessary to determine which method is best suited for teaching history in different situations, such as document (a) analysis, (b) essay writing and (c) explicit content-learning.

Purpose of the Project

The purpose of this study is to evaluate the impact of three different pedagogies on cognitive student engagement in secondary level history classrooms. Game-based learning, direct instruction, and collaborative learning are the three approaches. Each will be evaluated according to different types of lesson requirements and the varied learning needs of students, such as which contexts each approach is most suited for. Special emphasis is placed on game-based learning, as this pedagogy was developed more recently relative to the other two approaches.

Both direct instruction and collaborative learning can be traced back to prototype pedagogies developed during the 1960s (Stockard, 2021; Yang, 2023). Game-based learning, on the other hand, is a relatively new teaching approach with the potential to improve student engagement to a greater degree than other pedagogical approaches. While digital games were first developed in the 1960s and 1970s, intense study of the use of “serious” games designed solely for education began in the 2000s (Jaiswal, 2021; Marklund, 2015). Plass et al. (2015) asserted that all forms of play could result in all types of engagement, but that the type of engagement achieved would depend on the game used. Some studies have shown promise in terms of improving student performance and engagement in history courses through game-based learning (Jaiswal, 2021; Marklund, 2015). A conclusive discussion of the effectiveness of differing methods would answer several questions, namely:

1. Which teaching approach results in the greatest improvement of student engagement?
2. In which contexts should game-based learning be used to best align with the Historical and Social Science Analysis Skills Standards (2023)?
3. In which contexts should direct instruction be used to best

align with the Historical and Social Science Analysis Skills Standards (2023)?

4. In which contexts should collaborative learning be used to best align with the Historical and Social Science Analysis Skills Standards (2023)?

An in-depth critical evaluation of the relative effectiveness of game-based learning, collaborative learning, and direct instruction is critical to the field of history education. While educational researchers would benefit from the results of this project, this work is more important for history teachers on a practical level. History and social science teachers need to know which teaching approaches are the most effective at teaching historical content, concepts, and critical thinking skills. Without this project, the question of which teaching approaches are most effective in the history classroom would remain unanswered and history teachers would be taking a risk if they were to use an unproven approach for their lessons.

Theoretical Framework of the Project

Game-based learning, direct instruction, and collaborative learning are each supported by a unique learning theory. Therefore, any evaluation of the relative effectiveness of these teaching approaches is also a test in efficacy for the methods' respective foundational theories. Game-based learning is supported by constructivism; direct instruction is built around behaviorism; collaborative learning is founded upon social constructivism. Each theory has an extensive history of research affirming its merit as a valid learning theory. While all three theories are discussed in this section, the project will be written from a constructivist perspective.

Constructivism is a learning theory which states that people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences. Constructivism was originally developed from work by Piaget (1977). In the context of the classroom, constructivism holds that students learn by integrating new information and experiences together with their existing knowledge base (Bada, 2015; Sumarna & Gunawan, 2022). Learning is always active under constructivism, as learners compare new information to their current understandings and address any inconsistencies. For instance, a person cannot construct new knowledge if one is a passive learner. Game-based Learning is a good example of active learning. Students use their existing knowledge as they play a game, their experience of play demonstrates and applies new concepts, and their post-game reflection offers an opportunity to reflect on what the students encountered. Teachers present content to students, who then compare new concepts to their existing knowledge before applying what they have learned.

Objectivism, on the other hand, holds that information itself is objective and absolute, and any individual's interpretation of knowledge is either correct or incorrect (Bada, 2015). While this theory may hold true for learning

objective facts, formulas, or basic information, critical thinking and problem-solving skills are subjective in nature. Bada (2015) asserted that learning environments which more closely align with constructivism rather than objectivism may be more effective. Johnson (2009) disagreed with that assessment by examining both constructivism and applied objectivism which he referred to as "instructionism." Johnson instead concluded that existing effectiveness research was inconclusive about whether constructivism was more appropriate than instructionism, or whether the opposite was true. Furthermore, Weegar & Pacis (2012) felt that constructivism was better fitted for classrooms which have integrated educational technologies, whereas behaviorism was determined to be inadequate as an independent educational approach. The researchers asserted that a shift in educational thought had occurred away from behaviorism to constructivism or a combined behaviorist-constructivist approach, especially regarding educational technologies.

Direct Instruction lies in opposition to constructivism and instead assumes that every student is able to learn, given that certain conditions are met. In other words, direct instruction and "instructionism" falls under the framework of behaviorism. This learning theory grew out of the work of Skinner (1974). Courses taught along behaviorist principles assume the responsibility for learning rests upon the teacher rather than the learner (Weegar & Pacis, 2012). Pedagogies based on behaviorism allow educators to both easily quantify success and predict learner behaviors (Ahmad et al., 2020). However, the theory is a fundamental departure from constructivism in that all behaviors are considered to be learned and originate from external stimuli, not accounting for a learner's level of cognitive development.

Collaborative learning grew out of Piaget's (1977) Theory of Constructivism and Vygotsky's Theory of Social Development as cited in Yang (2023). The Theory of Social Development itself developed out of Piaget's idea of how children develop cognitively (Verenikina, 2010). Vygotsky's framework, however, stressed that both children and adults were active participants in the learning process (Verenikina, 2010). Taken together, these theories hold that learning is constructed after social interaction and observation. Learners then integrate new experiences into their existing base of knowledge, either reconciling or replacing old information with new understanding. Collaborative learning and game-based learning are therefore based on similar theoretical frameworks; while both are constructivist, collaborative learning emphasizes the importance of social interaction as an essential component of learning (Bruffee, 1984; Bruffee, 1993; Roselli, 2016; Yang, 2023). Wang & Huang (2021) examined serious games for the purpose of collaborative learning, thus combining aspects of collaborative learning with game-based learning. It is therefore reasonable to conclude that the two methods experience overlap because of their shared theoretical heritage.

The respective relationships which game-based learning, collaborative learning, and direct instruction each have with cognitive engagement will be

explored in this project. As cited in Gurcan, et al. (2023), four theories developed in the 1980s and 1990s serve as the foundational principles of student engagement. First, the student involvement theory (Astin, 1984) asserts that the physical and psychological energy given to educational activities by students can be summed up by the umbrella term of “student engagement.” Second, the theory of academic and social integration (Tinto, 1975) posits that students leave university due to a variety of factors, such as being unable to manage study time utilize available resources, a weak social integration, academic difficulties, and unclear goals. Third, the participation-identification model (Finn, 1989) explains why students withdraw from school, emphasizing participation in school activities and identifying a school’s values and social standards. Fourth, flow theory (Csikszentmihalyi, 1990) refers to the idea that educators should consider attention, interest, and entertainment when designing curricula to maintain the flow of learning activities.

As mentioned previously, Wong et al., (2024) identifies how student engagement has been conceptualized and measured by researchers in the field. They split student engagement into three component parts: affective, behavioral, and cognitive engagement. Student engagement has been used by many researchers as a general term to refer to teacher-student relationships, contextual/learning support, even to student social processes and involvement in non-academic school activities. A study cannot be valid if the object of study is not clearly defined. Categorizing the different types of student engagement is therefore imperative for the success of this research project. Affective engagement is defined as “students’ affective reactions to academic work, classmates, teachers, and school” (Wong et al., 2024, p. 50). Behavioral engagement measures the degree to which students participate in school-related activities such as (a) sports, (b) social events, (c) school spirit and (d) other extracurriculars. Cognitive engagement represents student investment in academic performance, their goals and aspirations, and lessons which require mental effort and the use of their cognitive abilities (Wong et al., 2024). This tripartite model of student engagement shall be used to delineate between the different types of student engagement in the current project so that the parameters of the current research project remain clear and consistent throughout each chapter.

Definition of Key Terms

The following terms have special importance as they relate to the current project and must therefore be defined in detail. The parameters set by these terms’ definitions, some of some originating from existing literature, will keep the discussion consistent and guide the research to an agreeable conclusion.

Secondary Level: refers to the “high school” level only, i.e. 9th, 10th, 11th, and 12th grade. 7th and 8th grades are not included in this range.

Student Engagement: refers to all three types of student engagement.

Affective, behavioral, and cognitive engagement are all distinctly different from one another, but each of these falls under the larger category of student engagement (Wong et al., 2024).

Affective Engagement: defined as students’ affective reactions to academic work, classmates, teachers, and school. Examples of affective engagement include interest in classroom learning, teacher-student and peer relationships, and students’ identification with their respective schools (Wong et al., 2024).

Behavioral Engagement: defined as students’ participation in school-related activities, including academic, social, and extracurricular events. This also includes school climate and culture (Wong et al., 2024).

Cognitive Engagement: defined as students’ personal investment in their learning and the use of advanced cognitive skills, mental effort, and mental orientation and motivation toward school and learning. This includes students’ academic goals, future aspirations, and attitudes towards learning and school-work (Wong et al., 2024).

Game-based learning: the integration of game-based learning principles into the foundation and framework for a lesson, where students’ experience playing the game facilitates learning (Scholz et al., 2021).

Gamification: refers to the addition of game-based elements to an existing lesson activity, which is distinctly different from game-based learning (Scholz et al., 2021).

Direct Instruction: refers to two different concepts in wider literature. “Direct Instruction” will be italicized when describing the education program founded in 1964 by Engelmann, Bereiter, Carnine, Osborn, Becker, and others to test a specific pedagogical approach focused on teaching concept formation. However, “direct instruction” will be used when referring to a broader set of teacher behavior built around explicit instruction. Components of direct instruction include: first, deliberately structuring and catering materials to achieve learning goals; second, using clear and concise instructions; third, seeking student responses to activities and/or intentional questions; fourth, providing immediate feedback for student answers; and fifth, minimizing free time (Mason & Otero, 2021).

Summary

Students in today’s history classrooms are not as engaged as they once were. While the COVID-19 pandemic caused new problems and made existing ones worse (Appleton et al., 2023), student engagement has been in decline for some time. According to a 2018 Pew Research Center Survey, some 95% of adolescent students had access to smartphones; 45% of teens reported being online constantly and the number doubled from the same survey conducted in 2014 (Pew Research Center, 2018). If not addressed by school administrators and teachers, the massive surge in phone access and usage could prove disruptive to learning environments, in turn, negatively impacting cognitive student engagement. One possible way to address this problem of low engagement is

to make lesson activities more interesting and relevant. Game-based learning is one possible way this can be done. If history teachers are to use game-based learning in the classroom, they need to know whether the pedagogy will work for their domain.

This study will seek to explore whether game-based learning, direct instruction, and collaborative learning improve student engagement while also discussing which contexts each approach is most suited for in the history classroom. Both game-based learning and collaborative learning are examples of constructivism implemented in the classroom, though the latter pedagogy emphasizes the social aspect of learning found in social development theory. Direct instruction, meanwhile, is based upon the learning theory behaviorism.

Chapter 2, the next section, discusses several different strands of literature in alignment with the purpose of this project. The literature review first focused on the consensus scholars have reached regarding history education. The review then shifted to an exploration of the role game-based learning, collaborative learning, and direct instruction had in the classroom as well as each methods' impact on student achievement during history lessons. The conclusions reached following the literature review, classroom and policy implications of those conclusions, as well as avenues for future research are also examined in Chapter 3. Special attention is given to teacher preparation programs, curriculum design choices made by teachers, school districts, and textbook publishers, as well as recommendations for how to use game-based learning, collaborative learning, and direct instruction in the classroom.

Chapter 2: Review of Related Literature

Introduction

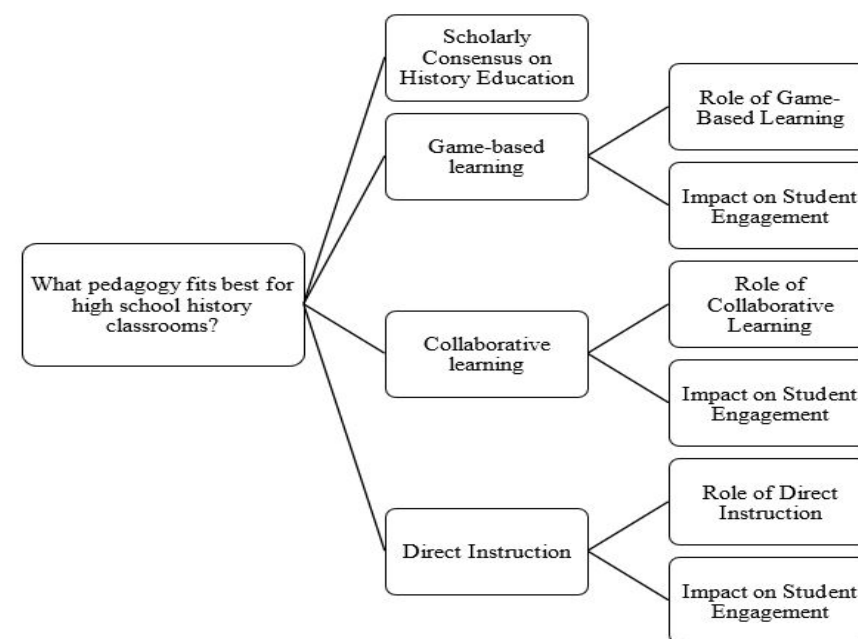
The issue at hand is low cognitive student engagement in high schools, which extends to history classrooms. Studies have shown that a significant number of students are, on average, either participating while unengaged or fully disengaged in class. Student engagement is a broad term used in many contexts, giving the phrase multiple meanings. In the context of this paper, Appleton (et al., 2023) noted that student engagement refers to the three types of engagement as defined by the existing scholarship: cognitive, affective/emotional, and behavioral.

The purpose of this study was to evaluate the impact of three different pedagogies on cognitive student engagement in secondary level history classrooms. Game-based learning, direct instruction, and collaborative learning were the three approaches. Each was evaluated according to different types of lesson requirements and the varied learning needs of students, such as which contexts each approach was most suited for. Special emphasis was placed on game-based learning, as this pedagogy was developed more recently relative to the other two approaches.

The literature review is divided in the following manner (see Figure 1): the first section discusses effective practices for history education, while the remaining three sections examine game-based learning, direct instruction and collaborative learning; the sections on teaching pedagogies are further subdivided into an in-depth description of method implementation and the impact of each method on student engagement.

Figure 1

Organizational Framework for the Literature Review



Scholarly Consensus on History Education

Researchers established several patterns in historical education, all of which are in line with the field of history at large. Wojcik et al. (2013) investigated instructional strategies recommended in social studies textbooks according to historical perspectives from 1960 to 2010. In their study, Wojcik et al. found that all textbooks from every decade researched recommended that teachers use a variety of strategies for different contexts rather than a single approach. Differentiated instruction, in particular, had early roots defined in a textbook as early as 1985. All 20 books included discussion, inquiry, and supplemental reading material as recommended practices. All of the texts studied by Wojcik et al. (2013) also suggested using inquiry-based strategies. Textbook authors justified variety in method by claiming that using different teaching practices would "pique or maintain student interest and motivation, to meet assorted learning objectives, and to reach students who possess diverse learn-

ing styles” (Wojcik et al., 2013, p. 245). Student engagement would therefore be supported by the use of multiple teaching approaches for different contexts.

Historical Discussions

Researchers in one study developed a framework to prepare social science teacher candidates to hold historical discussions in both elementary and secondary classrooms. The framework emphasized engaging students as “sense-makers,” orienting students to each other, orienting students to historical sources, and orienting students to interpretive practices of history as a discipline (Reisman et al., 2018). The researchers sought to use discussion as an opportunity to formulate new ideas about historical events and course content, which is a constructivist approach (Piaget, 1977; Reisman et al., 2018). However, discussion was also seen as a reflection of social constructivism, as students also developed ideas together when in a common learning community (Reisman et al., 2018).

Historical Sources

When teachers oriented students to historical sources, students interacted with the shared cultural and historical identity taken on by those sources. Finally, as students interacted with each other and historical sources, their discussions reflected the kind of historical analysis conducted by professional historians. Teachers, however, had to be explicit when guiding discussion and recognizing such patterns of critical analysis and historical skills (Reisman et al., 2018). Beyer (2008) agreed with Reisman et al., (2018) positing that critical thinking skill instruction should be explicit and both continually practiced and supported introducing new skills through lessons focused solely on their instruction.

Teaching Practices

Both Guerrero-Romera et al. (2022) and Wojcik et al. (2013) found a discrepancy between perceptions of teaching practices and which practices were actually used in the classroom. Wojcik et al. (2013) found that while textbooks recommended the use of many different teaching methods, teachers typically only used one or two primary methods. This was due to the fact that teachers often teach in the same manner in which they themselves were taught, a phenomenon known as “apprenticeship of observation” (Wojcik et al. 2013). Meanwhile, Guerrero-Romera et al. (2022) found that while teachers often contemplated using unconventional methods as opposed to emphasizing the transmission and memorization of information, they still opted to focus on the latter.

Case-Study Comparison

Case-study comparison is another approach to historical education

which can be taught using one of the teaching approaches studied in this paper. Straaten et al. (2019) determined that comparing past events to present events improved student engagement by fulfilling personal interest and increasing individual student investment in lessons and learning. Making connections between historical content, students were required to learn, and students’ individual or group assets were established as desirable for all lesson frameworks, assuming the context for making such connections was appropriate.

State Standards for History Classrooms and Teacher Preparation Programs

The History and Social Science Analysis Skills Standards (2023) from California Common Core requirements thoroughly explained what history students are expected to learn and be able to do in grades 9 through 12. By considering the standards set by the state, one can establish what types of activities history teachers are expected to demonstrate. The standards were divided into three main categories (a) Chronological and Spatial Thinking, (b) Historical Research, Evidence, and Point of View, and (c) Historical Interpretation. Learning activities in history classrooms must have students do one or more of the following actions (Historical and Social Sciences Analysis Skills, 2023):

- Compare the past with the present; analyze how history changes over time
- Critically analyze arguments, perspectives, and historical interpretations
- Construct and test hypotheses through the evaluation of primary and secondary sources
- Show connections between historical events and larger trends/phenomena
- Recognize the complexity of historical causes and effects
- Interpret past events within the context in which they happened rather than solely through modern beliefs and values

These summarized standards reflect the vast majority of activities designed and implemented by history teachers at the secondary level. Every student is expected to engage in complex historical analysis of sources and interpret opposing perspectives and narratives, all while developing their own independent worldview. The pedagogies discussed below could be employed to meet the criteria listed above. The contexts in which game-based learning, direct instruction, and collaborative learning could best be utilized are discussed in Chapter 3.

The California Preliminary Multiple Subject and Single Subject Program Handbook (Commission on Teacher Credentialing, 2024) also had important insights into the standards the California state government set for teacher preparation programs. The Handbook focused on both Universal Design for Learning and Multi-Tiered System of Supports as ways to engage and

support all students in learning while also providing specific examples of what teachers should do in their classroom specific to their subject, including history/social science. An emphasis on the wider application of history and social science analysis skills was evident, as well as a general call for students to reflect on “contextual understandings,” “recognizing bias and subjectivity,” and “the discussion of sensitive issues” (Commission on Teacher Credentialing, 2024, p. 37).

Game-Based Learning

When compared to established teaching methods, game-based learning is relatively new. The method has been the subject of increasing scrutiny and study over the past 20 years as an alternative approach to student engagement (Jaiswal, 2021). Many students do not perform well because they do not pay attention during important lessons because the activities do not engage them. While students have the responsibility to learn under a constructivist framework, teachers still have the responsibility to do whatever they can to facilitate easier learning. Previous studies linked cognitive achievement to improved achievement of learning outcomes (Wong et al., 2024). Additionally, Game-based learning has shown promise in improving both student engagement and achievement (Fonseca et al., 2023; Lei et al., 2022). Over the past 20 years, games have risen in popularity among all demographic groups in the U.S. and have become a significant part of many people’s lives. Many games already focus on content related to the subject matter which students eventually learn in formal academic settings. Being able to adapt such consumer games, as well as developing educational games with the intent to teach subject-matter content and critical thinking, may make lessons more engaging and improve cognitive achievement.

Game-based learning is based on constructivism, the learning theory primarily developed by Piaget (1977). Learners “construct,” or acquire, new knowledge by engaging in new experiences. Constructivist learning is also typically active, not passive. Game-based learning reflects constructivist thought – players use existing knowledge to help them succeed in a game and add what they experienced during play to their existing understanding of the world around them.

Role of Game-Based Learning

The manner in which game-based learning was used in the classroom depended on a variety of factors, each of which had the potential to impact student engagement. These factors were as follows: (a) game format, (b) game type, (c) game purpose and, (d) game content. Game format referred to the delineation between digital games and non-digital games. Game type concerned the practical rules and technical specifications of the game. For example (a) whether it was a group game, cards or dice were involved, (b) if there

was a game-board,(c) if the game was cooperative or competitive and, (d) other similar questions. Game purpose had to do with the reason for which the game was made. Games were created to entertain, to educate, or potentially do both. For example, the game Oregon Trail was originally made as an educational game for the classroom, but then later marketed and sold as a popular game to entertain millions (Jaiswal, 2021). Titles from the Assassins Creed franchise, on the other hand, were developed by video game companies in pursuit of profit and thus emphasized entertainment over educational value and strict historical accuracy.

Game purpose was closely related to, but distinctly different from, game content. The content of a game may have been factually accurate to history, but games sometimes did not subscribe to potentially biased interpretations of history. The grand strategy games developed by Paradox Interactive, such as Europa Universalis IV, Hearts of Iron IV, Victoria II, and Crusader Kings III may have been more accurate historically, but they still allowed for alternate historical scenarios which deviated wildly from real history (Carpenter, 2021; Lundblade, 2019). Furthermore, these games were Euro-centric in nature and thus often disregarded the significance of non-European narratives and perspectives (Carpenter, 2021). These factors all had the potential to change student perception of history and expectations for lessons. If a student was asked to play a game originally intended for entertainment, but which was coopted and adapted into a learning activity, the question arose, Was the primary objective for the student to learn history and develop their historical analysis skills, or to have fun? The discussion of these factors is an attempt to answer that question.

Game Format

Research on game-based learning generally focused more on digital games rather than non-digital formats, but studies examining both categories of games do exist. Digital game-based learning (DGBL) was easier to facilitate and conduct in certain situations. Online courses, for example, required all activities to be administered digitally and thus could not accommodate non-digital games in lessons (Moseikina et al., 2022). Access to computers has increased over the past decade with 63% of schools having a computer for every student in school, and a further 27% of schools having a computer for every student in some grade levels or classrooms (Gray & Lewis, 2021). Schools also reported that 92% of teachers found finding enough computers to use with their students either always easy or usually easy (Gray & Lewis, 2021). With access to digital technologies increasing across the country, some of the infrastructure required for DGBL lessons appears to already be in place. However, there still were perceived barriers to implementing DGBL lessons (Kaimara et al., 2021). These limitations are discussed in Chapter 3 of this project.

Game Type

The type of game used in lessons was considered as a research topic. Researchers classified games in multiple different ways (Barz et al., 2024; Cai et al., 2022; Chen et al. 2020; Ke, 2016; Pan et al., 2022). However, multiple researchers agreed on the same system of categorization. For example, (a) action, (b) adventure, (c) construction, (d) puzzle, (e) role-playing, (f) simulation, and (g) strategy were all unique game type; each one different in their mechanics, narrative styles, and measures of success (Chen et al., 2020; Ke, 2016; Pan et al., 2022). Each of these game types impacted student achievement and engagement in different ways and are discussed later in this chapter. Table 1 defines each game type in detail, according to the framework defined by Ke (2016).

Table 1

Classification of Games According to Type, with Definitions

Game Type	Definition
Action	Focuses on quick thinking and reflexes
Adventure	Built around a journey, usually of exploration, taken by the player
Construction	Players design, build, and manage resources (e.g. city building)
Puzzle	Players solve puzzles and riddles using logic or other thought processes
Role-playing	Gameplay emphasizes interacting with characters, collecting information, and decision making
Simulation	Players interact with a simulated model or virtual world; less goal-driven than adventure games
Strategy	Players develop and implement plans to achieve a goal

Note. Adapted from “*Designing and integrating purposeful learning in game play: a systematic review*,” by F. Ke, 2016, *Education Tech Research Dev*, 64, p. 222 <https://doi.org/10.1007/s11423-015-9418-1>.

Game Purpose

Some researchers conflated game purpose with game type (Barz et al., 2024). However, game purpose was distinctly different from game type. While game type concerned the mechanics of a game, game purpose referred to the reason for which a game was designed. Both Karsenti & Parent (2020) and Kavak (2022) defined games as either serious or commercial. Serious games, also sometimes referred to as educational games or games for learning, were found to be designed with the purpose of educating the player. Commercial games, on the other hand, were developed by game studios for the purpose of sale to large regional or global markets. In other words, commercial games were a form of popular media and entertainment, similar to that of novels, films, and television programs. Other researchers discussed the possibility of using commercial games to teach history and improve historical literacy. Rossi

& Bondioli’s investigation stemmed from the fact that history and past events have become “important means of entertainment” (2021, p. 6). Researchers found that games depicting history have important roles in the high school history classroom. Karsenti & Parent (2020) posited that games such as those in the Assassin’s Creed franchise could be used as a means of investigating depictions of history and historical perspectives, which is a core theme of historical analysis. Karsenti & Parent (2020) also determined that teachers were most effective when acting as guides for students during explorations of historical media and content, seizing on opportunities to develop students’ critical thinking skills.

Game Content

Game content refers to the accuracy of the information within any given game; this is often defined by that game’s purpose. Commercial games are often less historically accurate than educational games (Karsenti & Parent, 2020; Carpenter, 2021). Lundblade (2019) described a process by which historical games sometimes reinforce historical misconceptions and stereotypes in public audiences and in future games. Game studios, out of a desire to make as much profit as possible, developed games built upon misconceptions and stereotypes held by their target audience. Popular games then spread stereotypes to those who have not yet been exposed to them, perpetuating said stereotypes both in the public consciousness and in newly developed games (Lundblade, 2019). This negative feedback loop could be broken by an informed audience and critical eye, but many audiences were not exposed to enough historical information and alternate sources to make such judgements. Game content was not found to be a significant factor impacting student engagement, but the factor is still relevant to discussions about contexts in which to use certain games in the classroom.

Impact of Game-Based Learning on Student Engagement

Some of the moderating factors discussed in the previous section affected student engagement. Each factor is discussed below.

Game Format

Both DGBL and non-digital GBL were shown to improve student engagement. DGBL activities and frameworks had positive impacts on several aspects of students’ learning (Karsenti & Parent, 2020; Khan et al., 2017; Nadeem, 2022). Overall, DGBL activities improve student engagement during lessons, but the component parts of such frameworks have varied effects. Khan et al. (2017) measured the effect of digital game-based learning on student engagement. Although learning outcome did not significantly improve, engagement increased. Khan et al. (2017) may have conducted their study in secondary science and not social studies or the humanities, but the implications of the study are still important to note.

Moodle-Based Activities

Nadeem et al. (2022) compared student engagement during both game-based activities and Moodle-based activities. For context, Moodle is an online learning management system in which educators can (a) create quizzes, (b) learning activities, (c) discussion forums and, (d) grade student work. While both activities were digital, only one of the activity designs was game based. The game-based activities proved to be more effective at engaging students in the learning process compared to the Moodle-based activities. Students completed the game-based activities at higher rates and spent more time on them. Some students completed the game-based activities more than once, either for fun or to achieve higher scores. The game-based activities therefore showed marked positive differences in self-motivation compared to other teaching methods.

Effects of Competition

The work by Nadeem et al. (2023) was partially corroborated with that of Chen et al. (2020), which focused on the effects of competition in digital game-based learning (DGBL) on student engagement and achievement. Subject domain, grade level, and game types were all moderating factors influencing competition in DGBL. Though previous research on the impact of competition in DGBL was ambiguous and inconclusive, Chen et al. (2020) found that competition positively affected secondary level student learning outcomes in math, language learning, and science. While competition in DGBL did not have a significant effect on social science lessons, DGBL still had a nominal positive impact on learning outcomes for all subjects at all levels.

Non-Digital Formats

Other studies examined game-based learning (GBL) in non-digital formats. Kruskopf et al. (2021), Marnin-Distelfeld (2020), and Spalding (2021) each presented unique implementations of non-digital GBL. Kruskopf et al. (2021) built a university course on international relations around students playing the popular board game Diplomacy. Students were required to read from assigned texts and attend lectures and subsequent small group discussions before playing sessions of the board game. Each lecture and corresponding game session had a specific theme relating to course content. Not only were students given more opportunities to reflect on applications of course concepts, but they also made connections between course concepts which were not explicitly covered during class.

Marnin-Distelfeld (2020) investigated the historical principles of a card game intended to teach aspects of local public history. Students playing the game witnessed things like historical continuity, or the fact that the present is a direct continuation of the past. Spalding (2021) also developed a game for undergraduate history courses, using cards and a map depicting the region in

which the events of the course took place. Each card was labeled with a specific historical concept or event. In order to gain points for their team, students made historical connections between cards in their hand and those already in play. The game was only played four to seven times per semester; activities more typical for undergraduate studies were conducted during the rest of the semester's classes. With each implementation of each of these different non-digital games, student performance and engagement improved (Kruskopf et al., 2021; Marnin-Distelfeld, 2020; Spalding, 2021). These articles show that, when used effectively, non-digital GBL was just as viable as DGBL.

Narratives of Digital Game-Based Learning (DGBL)

The type of narrative used in DGBL also affected student engagement. Breien & Wasson (2021) isolated narratives found in 15 DGBL systems according to type and determined which aspects of narratives have the greatest positive impact on student engagement and motivation. For a narrative DGBL framework to have the greatest positive effect on engagement, it had to have the following characteristics: (a) a quest-based hub-landscape world, in which players explored isolated scenes of a larger world and progress sequentially from one scene to another; (b) modifiable objects, where players were able to interact and significantly alter the world setting through in-game action; (c) developed and detailed non-player characters who fitted seamlessly into the game's narrative; (d) dynamic and modular scripted stories, with plot arcs that were completed in different orders each playthrough (Breien & Wasson, 2021). While the study's sample size was limited, the narrative of a digital game used for learning was still determined to improve student engagement.

Game Type

Game type was found to be a limited factor influencing cognitive engagement. When students played games they preferred, they reported higher levels of engagement. Ke et al. (2015) found that engagement was dependent on initial player attitudes and motives for play. While some students had social motives and thus favored games involving socialization and teamwork, players seeking immersion instead preferred games involving exploration, open worlds, and role-playing. Gender and educational ability also determined game preference. For example, Ke et al. (2015) found that boys with lower educational ability preferred action games, while boys with higher educational ability found value in the social aspects of multiplayer games. Classroom demographics therefore impacted student engagement in game-based lessons, as demographic was a predictor for game preference. Game type was also found to have other effects, such as on computational thinking (Lu et al., 2023) and critical thinking (Mao et al., 2022), as well as being related to scaffolding in DGBL (Cai et al., 2022).

Game Purpose

The literature was mixed concerning the impact of game purpose on student engagement. Barz et al. (2024) found that “serious games,” or games intended to teach content, had no significant influence on overall learning outcomes when compared to simulations or mixed-purpose games. Zhang & Yu (2022), meanwhile, found that gamification had a higher relative positive effect on learning achievement and motivation relative to game-based learning, with both pedagogies having significant positive effects. While Zhang & Yu (2022) conducted their study in China and measured learning outcomes for English rather than history, the results of the study are still relevant.

Karsenti & Parent (2020) dissented from Barz et al. (2024) in their study of the use of a commercial game in the history classroom. They found that the means by which games were employed impacted student engagement and performance. The first teacher discussed by Karsenti & Parent (2020) used portrayals of history, historical events, and historical figures from Assassin’s Creed, the game focused on by the study was to enhance surface-level discussions about those topics. However, the first teacher reported lower levels of student engagement relative to the other teachers in the study, who instead used the game as an opportunity for students to conduct critical historical analysis, evaluating the game’s historical accuracy and why it portrayed events in certain ways (Karsenti & Parent, 2020). Notably, only 9.2% of students reported not liking the use of Assassin’s Creed in class. Although 58.7% of students liked or loved using the game in class, 32.1% of students did not particularly care. The teacher whose pedagogy resulted in lower levels of engagement also earned a lower score than the other teachers when the students were asked whether they wished to use Assassin’s Creed more often in class. While the conclusions reached by Karsenti & Parent (2020) were different from that of Barz et al., (2024), they both still asserted that game-based learning improved student engagement overall. The results from Karsenti & Parent (2020) indicated that implementation was an important factor in determining instructional strategy effectiveness. While they came to that conclusion, their work has greater implications in the context of this paper and other research. Barz et al. (2024) only considered a single form of implementation for the types of games they measured, but each game could have been used in multiple ways. The findings of Lekwa et al. (2018) corroborate this fact, in that the quality and frequency of teaching method used was a predictor for student engagement. The context of lessons is therefore an additional determinant of whether an instructional method was effective for any method used- not just game-based learning.

Game Content

Game content was not considered by researchers to be a factor affecting student engagement (Karsenti & Parent, 2020; Carpenter, 2021; Lund

blade, 2019). Game content concerned accuracy of learning material, and thus is relevant only to discussion concerning the contexts in which games should be used.

Collaborative Learning

Collaborative learning did not have a universal definition agreed upon by the education community. In Yang’s (2023) comparison between collaborative and cooperative learning, a generalized definition was given. Collaborative learning was defined as being based on theories of constructivism and critical pedagogy and consisted of qualitative approaches built around open-ended tasks. He divided existing research into four categories, according to the common directions taken by researchers in the field: (a) effect, (b) conditions, (c) interaction and, (d) design. Yang (2023) concluded that collaborative learning had an overall positive effect on learning achievement, though results were mixed. He also indicated the need for more research exploring the interaction of moderating factors, or conditions, essentially stating that the “interaction” category of research was found lacking (2023). Laal & Laal (2012) agreed with Yang’s (2023) assessment of collaborative learning, describing the approach as a variety of educational techniques involving students working with each other and/or with teachers. Groups of two or more students explored and engaged with content, with learning happening as students talked with each other.

Collaborative learning is founded in both constructivism (Piaget, 1977) and Social Development Theory (Verenikina, 2010, Yang 2023). Knowledge is not just the amalgamation of lived experiences, as described by constructivism, but instead acquired through a “process of negotiation or joint construction of meanings” (Roselli, 2016, p. 256). The social aspect of learning is the primary emphasis of collaborative learning.

Role of Collaborative Learning

Yang (2023) listed several strategies commonly used in collaborative learning lessons. For instance, (a) consensus groups, (b) peer tutoring, (c) collaborative writing, (d) reciprocal teaching, (e) learning communities and (f) team-based learning are all examples of collaborative learning. Cooperative learning, on the other hand, was described as a distinctly different approach founded upon different theoretical principles. Examples of cooperative learning included:

- Think-Pair-Share
- Jigsaw
- Group investigation
- Student-Team-Achievement-Division
- Team-Games-Tournament
- Team-Accelerated Instruction
- Learning Together

- Three-Step Interview
- Inside Outside Circle
- Rally Robin
- Numbered Heads Together
- Co-op Co-op

Only collaborative learning activities were considered under the purview of this project.

Consensus Groups

As stated previously, Reisman et al. (2018) developed a framework for history teachers to facilitate in-class discussions. The common practices described by Yang (2023) were consistent with the framework developed by Reisman et al. (2018). Consensus groups, first labeled as such by Bruffee, involved students working together on “a limited but open-ended task, negotiating among themselves what they think and know in order to arrive at some kind of... agreement” (1993, p. 86). After the small groups have had time to work on the task, the groups meet back as a class to discuss and negotiate a consensus as a whole. Consensus groups were recommended for all in-class discussions which are accompanied by text analysis and is exploratory in nature. Furthermore, Bruffee (1993) instructed teachers to refrain from intervening and explicitly monitoring student small group discussions in order to prevent bias from entering student conversations.

Peer Tutoring

Another method supported by Bruffee (1993) and examined by Yang (2023) was peer tutoring. Peer tutoring was described by both researchers as a kind of collaborative learning and a practice which illustrates to students that writing is a social act, a dialogue between author and audience. Given that the field of history involves a great deal of writing, peer tutoring as an iteration of collaborative learning is also in line with historical education literature. Bruffee (1993) specifically described peer tutoring as being especially appropriate for humanities courses as an extension of student discourse and engagement with content.

Collaborative Writing

Collaborative writing is closely related to, but distinctly different from, peer tutoring. One recent study measured the effectiveness of collaborative writing for language learning and humanities courses at the undergraduate level. Lopez-Pellisa et al. (2021) found that only 9.5% of study participants believed their writing skills did not improve after engaging in collaborative writing over the course of a semester, meaning that the strategy was largely effective in improving writing skills.

Reciprocal Teaching

Reciprocal teaching was first developed by Palincsar & Brown (1984) as a way to improve student comprehension skills. Teachers or designated students alternately led groups of students through a dialogue based on sections of a text. In their model, students summarized what was read, questioned key information from the text, clarified any points of confusion, and predicted what would happen next in the text (Palincsar & Brown, 1984; Institute of Education Sciences, 2010).

Collaborative Learning Communities

Collaborative learning communities and team-based learning were additional practices reflective of collaborative learning studied by researchers. Collaborative learning communities were described by Zamiri & Esmacili as being “collaborative, interactive, and often interdisciplinary spaces where individuals (learners) with common interests, goals, or educational pursuits come together to exchange their sharable knowledge” (2024, p.1). Learning communities were found to work well in conjunction with a myriad of other teaching strategies, including gamification. Moreover, collaborative learning communities were also able to accommodate for different learning preferences (Zamiri & Esmacili, 2024).

Team-based Learning

Team-based learning was developed with three essential components in mind: (a) permanent, assigned student groups; (b) a flipped classroom, in which students were expected to prepare extensively before class through course readings and assignments; and (c) frequent opportunities for students to express their knowledge of content and receive feedback from both teachers and other students (Michaelsen & Sweet, 2011; Ruder et al., 2021). The emphasis of team-based learning was on the development of academic peer relationships and high levels of collaboration within student groups.

Impact of Collaborative Learning on Student Engagement

Collaborative learning methods had significant positive effects on student engagement. Ruder et al. (2021) found that team-based learning practices enhanced student engagement and learning achievement. Zamiri & Esmacili (2024) asserted that collaborative learning communities were examples of active learning and thus improved student engagement and deep understanding of course material. Peer tutoring and consensus groups were created for the purpose of improving student engagement through greater collaboration (Bruffee, 1984; Bruffee, 1993). An exploratory study by López-Pellisa (2021) validated the claims made decades earlier by Bruffee (1984) when it found that peer feedback during collaborative writing increased student engagement.

Okolie et al. (2022) found that as students solved collaborative learning tasks, overall engagement increased. Temirkhanov et al. (2024) determined

that not only was collaborative learning highly effective at achieving high performance results, but also that student engagement increased with perceived value of the skills being taught. In other words, students became more engaged when learning skills that they believed they would later use in daily life or future career. Sun et al. (2022) concluded that engagement was higher during collaborative learning lessons compared to direct instruction lessons because the opportunity for student participation was greatly expanded. These results imply that when participation was maximized, engagement increased. The ideal situation, then, was for students to be interested in the topic being learned, successful in task completion, and given ample opportunity to express their thoughts and ideas.

Direct Instruction

Direct instruction was another teaching approach extensively studied by a large volume of research (Stockard et al., 2018). When direct instruction was integrated with other effective pedagogical strategies such as multi-tiered systems of support and differentiation, instruction effectiveness only improved. However, this particular pedagogy is primarily teacher centered. In a lesson built around direct instruction, students did not always have the opportunity to communicate their reflections and feedback on content to the teacher or their peers (Sun et al., 2022). The freedom of direction for communication between teachers and students, as well as students with other students, was often important for fostering a positive learning environment (Stockard et al., 2018).

Direct instruction is based on the Learning Theory known as Behaviorism (Skinner, 1974). In behaviorist pedagogies, students learn skills in isolation from each other and learn through external stimuli. Direct instruction includes more passive elements because behaviorism is also somewhat passive (Hughes et al., 2017). Learners acquire new behavior through positive reinforcement and repetition rather than reflecting and processing new experiences.

Role of Direct Instruction

Researchers came to several conclusions for how direct instruction should be used in a secondary classroom. Stockard et al. (2018) and Stockard (2021) asserted that a direct instruction approach consisted of highly structured lessons given to teachers with intentionally scripted wording and sequencing. Students took placement tests to determine lesson difficulty level, with an emphasis on skill mastery. Students learned information and/or skills, mastered them, and built on them, receiving positive reinforcement from their teachers at every step of the way. Direct instruction assumes learners are “inherently logical” and make inferences from the world around them (Stockard, 2021). If students did not perform well, then the blame was placed on ineffec-

tive use of direct instruction rather than any fault of the student (Stockard et al., 2018; Stockard, 2021). Mason & Otero (2021) also emphasized the explicit and systematic nature of direct instruction.

While Stockard (2021), Stockard et al. (2018), and Mason & Otero (2021) found direct instruction to be effective, Eppley & Dudley-Marling (2019) dissented in their analysis of a curriculum styled after direct instruction and developed by McGraw-Hill. Eppley & Dudley-Marling (2019) found that direct instruction focused on low-level skills and that previous research was lacking in consistent control groups. In most of the studies which met their inclusion criteria, reading proficiency was measured not by comprehension or overall oral fluency, but instead by word-level skills. Their recommendation was to avoid using direct instruction to avoid possibly worsening learning obstacles between high-poverty schools and special education classrooms (Eppley & Dudley-Marling, 2021). It is important to note that Eppley & Dudley-Marling’s research concerned a set of scripted lessons rather than the collection of teaching practices which fall under direct instruction.

Impact of Direct Instruction on Student Engagement

Stockard (2021) and Stockard et al. (2018) claimed that student engagement rose commensurate with student achievement. The thought was that students were more engaged after they became successful learners. However, other research contradicted these assumptions. Sun et al. (2022) measured children’s engagement among 5th-grade students during both collaborative learning and direct instruction activities. Their findings indicated that children were less likely to be engaged in direct instruction lessons when compared to collaborative learning lessons. Sun et al. (2022) reasoned that direct instruction was fundamentally constricted by routine and lesson structure, and that the lack of flexibility and total reliance on the teacher to advance students’ learning caused students to be passive performers rather than active learners. However, the researchers also found that students in direct instruction classrooms were more engaged when interacting with the teacher than when they were alone or interacting with other students (Sun et al., 2022).

Other researchers felt direct instruction was not solely passive. Hughes et al. (2017) discussed “explicit instruction,” itself a development of direct instruction, and asserted that the teaching approach promoted student engagement by providing immediate opportunities for students to respond and receive feedback on their responses and work. Jong et al. (2023) also felt that while parts of direct instruction were naturally passive, students were still active in their reception and interpretation of content. Jong et al. (2023) further advocated for the integration of inquiry-based learning with direct instruction, thus combining a constructivist approach with a behaviorist one. Such an integration would give lessons more structure while retaining student autonomy and freedom in learning.

Summary

The problem addressed by this literature review was low student engagement in high schools, which included history classrooms. Student engagement was defined as being either cognitive, affective/emotional, and behavioral in Chapter 1. The purpose of this study was to evaluate the impact of three different pedagogies on cognitive student engagement in secondary level history classrooms. Game-based learning, direct instruction, and collaborative learning were the three approaches. Each was evaluated according to different types of lesson requirements and the varied learning needs of students, such as which contexts each approach was most suited for. Special emphasis was placed on game-based learning, as this pedagogy was developed more recently relative to the other two approaches. An assessment of current strategies used in history classrooms and expectations set by the California Common Core Standards framework was necessary for the discussion of proper contexts for the pedagogies listed. The consensus in history education was that learning activities should engage students in various forms of historical analysis and critical thinking. Game-based learning was split into various modifying factors, though only some positively affected engagement. The method was generally effective at increasing student engagement and enjoyment of history content. The research about direct instruction effectively engaged students, especially relative to the other pedagogies examined in the project. Though collaborative learning took many forms, most implementations of the method positively affected engagement. The conclusions reached following the literature review, classroom and policy implications of those conclusions, as well as avenues for future research are also examined in Chapter 3. Special attention is given to teacher preparation programs, curriculum design choices made by teachers, school districts, and textbook publishers, as well as recommendations for how to use game-based learning, collaborative learning, and direct instruction in the classroom.

Chapter 3: Implications

Introduction

This project sought to address a common problem which high school teachers face with increasing regularity: low cognitive student engagement during lessons. The purpose of this study was to evaluate the individual impact game-based learning, direct instruction, and collaborative learning had on cognitive student engagement in secondary level history classrooms. While educational researchers benefited from the results of this project, for history teachers this work is more important on a practical level. History and social science teachers need to know which teaching approaches are most engaging while remaining effective at teaching historical content, concepts, and critical thinking skills. Without this project, the question of which teaching approach-

es are most engaging in the history classroom would remain unanswered, resulting in history teachers taking risks by using unproven approaches when designing lessons.

Each research question (RQ), introduced in Chapter 1 on page 14 and restated below, is answered in the Conclusions section of this chapter.

- RQ 1: Which teaching approach results in the greatest improvement of student engagement?
- RQ 2: In which contexts should game-based learning be used to best align with the Historical and Social Science Analysis Skills Standards (2023)?
- RQ 3: In which contexts should direct instruction be used to best align with the Historical and Social Science Analysis Skills Standards (2023)?
- RQ 4: In which contexts should collaborative learning be used to best align with the Historical and Social Science Analysis Skills Standards (2023)?

Conclusions

After examining research on game-based learning, collaborative learning, and direct instruction, several conclusions have been reached. First, in response to RQ 1, active learners made for engaged learners. Second, in partial response to each RQ, student engagement was largely dependent on whether pedagogies were implemented effectively. Third, in response to RQ 2, engagement during game-based learning lessons was context dependent. Fourth, in response to RQ 3, collaborative learning was engaging when used in the right contexts. Fifth, in response to RQ 4, direct instruction was not as effective at engaging students when used independently.

The first conclusion concerns RQ 1, which asked which teaching approach resulted in the greatest improvement of student engagement. Many researchers felt that students were more engaged when they were active participants in learning (Lopez-Pellisa, 2021; Sun et al., 2022; Ruder et al., 2021; Zamiri & Esmacili, 2024). Game-based learning and collaborative learning, as described and investigated by the researchers considered in this project, were founded upon principles of active learning (Bada, 2015; Sumarna & Gunawan, 2022; Yang, 2023). However, the volume of literature investigating the relationship between direct instruction and student engagement relative to that of the other two methods examined appeared to be significantly smaller. This may have been due to the fact that the literature on direct instruction did not emphasize the importance of engagement, instead placing a premium on the sufficient achievement of learning goals and progressive acquisition of skills and behaviors (Eppley & Dudley-Marling, 2019; Hughes et al., 2017; Stockard et al., 2018). Upon reflecting on the literature, the researcher agrees with the scholars who posited that active learners make for engaged learners. Game-based learning and collaborative learning are therefore effective means of im-

proving cognitive engagement, so long as students remain active participants throughout a given lesson.

The second conclusion reached after completing the literature review was related to effective implementation of teaching methods and curricula. Some researchers found that student engagement often depended on whether or not a teacher correctly implemented their chosen teaching approach (Karsenti & Parent, 2020; Lekwa et al., 2018). In other words, teachers who taught skillfully and effectively were more likely to engage their students during lessons. While not quite within the initial scope of the study, this pattern implies two points: first, that some skilled teachers knew how to engage their students no matter the circumstances; second, that implementing certain teaching approaches did not necessarily result in automatic increases in engagement. Pedagogies must be implemented correctly and in the appropriate contexts for them to have positive impacts on student engagement.

When it came to game-based learning, the context of games used was a significant reason for why implementation had an especially large impact on engagement. Karsenti & Parent (2020) and Lekwa et al. (2018), and Khan et al. (2017) found that engagement increased during game-based learning activities depending on the circumstances of how games were used. Some studies, such as Barz et al. (2024) only considered one way of using game-based learning in the classroom, even though every game could, in theory, be used multiple ways depending on the lesson. Karsenti & Parent (2020), on the other hand, investigated how the same game could be used for different learning activities. The results of studies by Karsenti & Parent (2020) and Lekwa et al. (2018) led the researcher to conclude that teachers engage students most when they use methods which require students to think critically and use higher-order skills. In other words, students are engaged when they are challenged, each according to their ability level. Problems should not be so difficult that students give up and disengage, but that does not mean they should be too easy either. Students should feel satisfaction when completing a task, and that can only happen when they are met with tasks which are difficult, but not unsolvable through diligent work. Historical analysis may not make sense for some students at first, and that is ok. As long as students are given tasks which match their ability level, they will significantly progress in their learning and eventually advance to higher-level tasks.

Third, the context in which game-based learning should be used depends on both the demographics of the classroom and the purpose of the learning activity. Game-based learning is unique in that the approach can be customized to fit both the instructional needs of the teacher and the learning needs of the students. The fact that students were more engaged during lessons in which they played games they preferred (Ke et al., 2015) suggests that lessons should be changed to best fit the preferences and needs of students in each individual classroom. The purpose of a lesson also determines how a

game should be used in the classroom. If a lesson is intended to, for example, have students compare the present with the past (Historical and Social Science Analysis Skills, 2023), then a game similar to that designed by Spalding (2021) would fit well. In the game, students make connections between historical events as they play cards during the game. Some of the events on cards could easily be rewritten to represent current events, thus meeting the Historical and Social Science Analysis Skills Standards (2023). Game-based learning is not an approach which remains unchanged in every classroom, instead being differentiated in every case. While differentiation is desirable for any pedagogy used in the classroom, the customizability of game-based learning through game-type, game content, digital vs. non-digital formats, and more makes differentiation much easier to facilitate.

Fourth, similar to game-based learning, collaborative learning had to first be used correctly in the right contexts for the method to be engaging. However, overall, the approach did have a positive impact on student engagement. Because collaborative learning can take so many different forms, the pedagogy is also largely customizable to the learning needs of students. In response to RQ 3, (a) consensus groups, (b) collaborative writing and (c) peer tutoring are likely the most fitted for the history classroom out of all the types of collaborative learning activities because of the nature of typical social science courses.

History as a subject requires students to write and often analyze written texts, meaning that the more practice students have interacting with historical writing, the greater their performance will be. When considering engagement, some researchers cited common perceptions of collaborative learning as being ineffective due to the possibility of an unbalanced division of work among group members and low accountability (Laal & Laal, 2011; Ruder et al., 2021). Some activities had natural safeguards against non-participation and a lack of engagement – in the case of peer tutoring, if students did not give peer feedback, they then did not get points for that assignment as a consequence. While additional safeguards may still be necessary to ensure every student participates in the learning process, engagement was still positively affected when students worked on collaborative tasks or gave each other feedback in their writing (Okolie et al., 2022; Sun et al. 2022; Yang, 2023).

Relating to appropriate contexts for collaborative learning within the history classroom, the findings of Reisman et al. (2018) and Yang (2023) answered RQ 3. Reisman et al. developed a framework which engaged students in high level discussion of historical content, treating students as “sense-makers” rather than reporters and regurgitators of information (2018, p. 280). Collaborative learning can and should be used to facilitate deep discussions of history, historical sources, and historical content, which is in line with the Historical and Social Science Analysis Skills Standards (2023).

Fifth, in response to RQ 1 and RQ 4, direct instruction was not as

successful at engaging students when implemented by itself. While Stockard et al. (2018), Stockard (2021), and Mason & Otero (2021) touted the successes of direct instruction, they mainly focused on whether the method was generally effective at achieving positive learning outcomes. Engagement was not as high of a priority in those particular studies; the researchers claimed that engagement would naturally rise as student achievement improved (Stockard et al., 2018; Stockard 2021). Their claim was contradicted by Sun et al. (2022), who concluded that engagement during direct instruction lessons was low relative to collaborative learning.

The researcher is inclined to agree with Sun et al. (2022) for one main reason. While Sun et al. (2022) contradicted the claims of the pro-direct instruction researchers concerning engagement, the same was not automatically true of student achievement. Thus, while direct instruction may have been effective in many cases at positively affecting student achievement, engagement remained low. Sun et al. (2022) correctly pointed out that in direct instruction lessons, the primary focus was on interactions between teachers and students. When the teacher worked with students, engagement among certain individuals was high, but because the teacher could only be with so many students at one time, overall engagement was low. Collaborative learning, on the other hand, saw more student engagement because students were given more opportunities to engage both with each other and the content. Stockard (2021) advocated for direct instruction because the approach was supposed to allow students to respond to content and receive quick feedback, and in turn improve engagement. This claim, however, was fundamentally flawed.

Opportunities abound with collaborative learning: students have more chances to engage with content because every student has someone to engage with, either in pairs or groups, as opposed to a single teacher. This becomes even more apparent when one considers the fact that class sizes are often upwards of 30 students. If a teacher was supposed to interact with every student equally in a 30-student classroom during a 55-minute period, each student would only spend one minute and 50 seconds with their teacher – that does not include time spent on non-instructional activities like attendance and announcements. That is not enough time for every student to interact with their teacher – thus direct instruction lessons rely on a handful of students to drive classroom discussion, since only so many students will have time to speak. If instead discussion takes a different form than call and response from teacher to students, then engagement would increase.

Even though direct instruction was not as engaging as the other methods investigated, the approach can still be of use in history classrooms. Sun et al. (2022) felt that direct instruction could be beneficial when used alongside other pedagogies like collaborative learning. Direct instruction can provide the structure that collaborative learning and game-based learning may sometimes lack while still only playing a subsidiary role. Direct instruction is less flexible

and customizable than collaborative learning and game-based learning because the method follows a more rigid formula. On the other hand, game-based learning and collaborative learning can take many different forms because of the wide variety of games and learning activities which fall under both categories. While materials are able to be catered to achieve the learning goals in direct instruction (Mason & Otero, 2021), the lesson structure does not largely change between learning segments. Differentiation is still possible, but direct instruction remains less variable than both game-based learning and collaborative learning.

Practice Implications

First, commercial games, whether they be digital or non-digital, should be treated in the same way – as another form of media and an asset which teachers can choose to draw on for their lessons. If commercial games are used, they should be accurate to real history as possible. With any popular media, whether that be books, movies, or games, there is a risk that the liberties taken by media creators may translate into misconceptions and misunderstandings among consumers. When teachers use inaccurate media to teach factual content, they give authority to such popular media. In every case, inaccuracies must be identified for students to prevent them from learning falsehoods. Karsenti & Parent (2020) noted that commercial games can be used as opportunities to shine light on those kinds of inaccuracies in critical discussions about how history is portrayed in popular media. As the researchers themselves point out, this fits with how books and movies are already often used in classrooms today.

Second, collaborative learning can be integrated with game-based learning, as both approaches are similar in theoretical framework and frequently overlap. For example, many games naturally have a collaborative team element in their design. Combining both methods in an integrated approach would likely increase student engagement while allowing for additional differentiation in how lessons are structured.

If used, direct instruction should be combined with other approaches. The method has its place in the history classroom, but the risk of excessive focus on low-level skills and rote memorization as opposed to critical historical analysis (Eppley & Dudley-Marling, 2021; Reisman et al., 2018) necessitates an integrated approach which would guarantee that students learn higher-order thinking skills. Direct instruction combined with another approach, such as collaborative learning, is recommended by Sun et al. (2022) because direct instruction is not as engaging as other methods when used independently. However, because direct instruction is still effective in some cases (Mason & Otero, 2021; Stockard et al., 2018; Stockard, 2021; Sun et al., 2022), it can still be used in moderation. Formal, scripted direct instruction curricula was not engaging

(Eppley & Dudley-Marling, 2021) and should not be used if teachers desire to increase engagement.

Policy Implications

Several actions can be taken to better support teachers who wish to use pedagogies which increase student engagement. First, teacher preparation programs should instruct candidates in the use of multiple pedagogical frameworks, including but not limited to game-based learning, collaborative learning, and direct instruction. Programs should also teach candidates how to combine multiple approaches. Teachers need to know how to design lessons in multiple ways and be able to use different approaches to best fit whatever situation they encounter. Every student has individual learning preferences, and one of the first steps to increasing engagement is to meet those learning preferences. Current programs in California are required to teach on teaching principles and approaches like Universal Design for Learning (UDL) and Multi-Tiered System of Supports (MTSS), but the standards themselves are still somewhat open-ended (Commission on Teacher Credentialing, 2024). While this may have been intentional to allow for teachers to meet program standards in ways which best fit their personal style of teaching, nothing compels programs to teach how to implement a variety of specific pedagogies. However, teachers in every program should be shown how to use many different teaching approaches; they can then decide later whether they want to make use of those pedagogies when designing their own curriculum. Teachers may not need to use multiple methods in every lesson, but they need to be equipped with the knowledge should the occasion to use a specific pedagogy ever arise.

Second, more support for game-based learning and collaborative learning in history classrooms is needed, especially when curriculum design and adoption is concerned. Reisman et al. (2018) and Guerrero-Romera et al. (2022) all felt that a significant number of history teachers still teach lessons built around rote memorization and fact recitation. Teachers and schools may need to be compelled to move away from low-level lessons and towards engaging, thought-provoking content through a change in policy. School districts should adopt and/or commission textbooks which support multiple specific teaching approaches, i.e., iterations of different approaches like those investigated by the researcher. Textbooks can integrate open-ended frameworks like UDL and MTSS while also providing more specific frameworks like game-based learning and collaborative learning. When combined with more training in specific teaching methods, allowing for more choice in curriculum and lesson design enables teachers to better meet the learning preferences and needs of students. Should this happen, student engagement during lessons would likely increase on a large scale.

When it comes to digital game-based learning, the infrastructure necessary to support such programs and lessons is often lacking, as classrooms

may not have access to up-to-date equipment (Kaimara et al., 2021). Additional funding or a reallocation of existing funds intended to expand digital infrastructure is necessary if digital game-based learning is to be adopted on a large scale. A lack of information and communication technology training is also a barrier to the adoption of digital game-based learning (Kaimara et al., 2021). This is yet another issue which could be solved through additional funding, so that every teacher is equipped with the knowledge to successfully teach in educational settings which increasingly rely on digital resources and infrastructure.

Directions for Future Study

Future research should focus on the impact of game-based learning, collaborative learning, and direct instruction on student achievement in secondary level history classrooms, as this study did not examine such relationships. Each of these methods may also be examined relative to other teaching approaches not discussed by this project, such as inquiry-based learning, project-based learning, and more. While there were some studies comparing game-based learning with gamification, a higher volume of studies would benefit educators attempting to determine which method is more effective at improving both achievement and engagement. Improving engagement is important because of its positive link to achievement (Lamote et al., 2013; Lei et al., 2018; Szabó et al., 2024). While achievement can be improved independently of engagement, finding ways to improve both is important and needed.

While this project delved deeply into game-based learning, collaborative learning, and direct instruction, there are some limitations which need to be highlighted. First, some of the studies on student engagement at the secondary level were in fields related to history and the humanities rather than history itself, particularly with the studies investigating game-based learning and collaborative learning. Second, this project provided great insight into the potential effectiveness of game-based learning and collaborative learning in increasing engagement, but a greater volume of studies is necessary before game-based learning and collaborative learning can be definitively linked to engagement. Quantitative studies would be particularly beneficial in that regard.

Summary

This project sought to address the pervasive issue of low engagement in secondary level history classrooms through an investigation of three pedagogical approaches: game-based learning, collaborative learning, and direct instruction. The first two approaches were based on similar theoretical frameworks, with direct instruction being the most different in theory and practice. Game-based learning and collaborative learning both grew out of constructivist thought, though the latter also emphasized the social aspect of learning. Direct instruction was founded upon the tenets of behaviorism, the idea that all behaviors are learned through external stimuli.

Increasing student engagement is important to education because of

its link to student achievement. By improving student engagement, it is highly likely that achievement will also progress. This project sought to understand if cognitive engagement, or student engagement during learning activities, could be affected through the use of specific teaching frameworks. Based on the literature, several conclusions were reached. First, the way frameworks were implemented was often more important than the specific framework used. This was due to the fact that game-based learning and collaborative learning could be implemented in a wide variety of ways. Direct instruction, however, was found to not be as engaging as the other two methods studied by the researcher because the approach was formulaic in nature. Based on the literature review, an integrated approach would also prove beneficial and positively affect engagement.

The conclusions reached have several implications relevant to teachers, schools, and policymakers. First, the best way to improve engagement through game-based learning or collaborative learning is to account for student demographics and lesson purpose when choosing games and learning activities. Second, if direct instruction is used in the classroom, it should be done in conjunction with another approach. Direct instruction by itself was not as engaging as other approaches, but it can still be useful for meeting learning goals. Third, any commercial games used in game-based lessons should be used with the understanding that game developers have creative license, and that popular media may not always stay true to real history. Teachers should highlight any factual inaccuracies in games used during lessons in the same way one would when using movies or books. Fourth, teacher preparation programs should ensure teachers know multiple teaching approaches and how to use them both independently and in conjunction with each other. Teachers should not just be told that they need to use different teaching strategies in the classroom to reach more students, but instead should know a wide variety of approaches and when specific techniques are most appropriate. Fifth, school districts should adopt curriculum which supports multiple teaching approaches while also allowing teachers more agency in designing lessons. Doing so would enable teachers to cater lessons to best fit their unique student demographics. Sixth, schools and districts at large should ensure digital infrastructure is accessible for all students and remains up-to-date while simultaneously training teachers in the use of information and communication technology. Engagement can only be improved when teachers are flexible and adapt to evolving circumstances. Flexibility in lesson design at both the classroom and policymaking levels is key to improving the educational outlook for every student.

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School Culture: An Exploration of the Impact of School Leadership on Teacher Retention

Katherine Dalizu

Abstract

This research project aims to analyze the influence of school leadership on teacher retention and evaluate the effectiveness of Educational Leadership Preparation Programs (ELPPs) in training leaders to recruit and retain teachers. As the challenge to retain teachers intensifies, research indicates that leadership within schools has emerged as the primary determinant of teacher turnover. School culture permeates every institution, influencing all aspects of educational capital. Respect serves as a foundational element from which all other reasons for retention stem. The simple task of connecting with teachers as people and letting them know they are valued has shown to increase teacher retention. Research indicated there has been a gap between preparation and the realities of school administration. If leadership saw the main objective of their job as providing and caring for staff, trusting teachers to help students achieve academic success, teacher retention would improve. This project suggests that policy initiatives that embrace Talent-Centered Education Leadership, prioritize teacher support, reform ELPPs, and integrate the Four Capital framework are essential for fostering a supportive educational environment that attracts and retains talented educators committed to student success.

Chapter 1: Introduction to the Project

Background

Every school operates with unique procedural norms daily, and the teachers at any given location are impacted by what the school norms are and how they are carried out. The primary task of a school is to ensure students are in a safe environment where they can gain knowledge and skills to contribute to society. Teachers are the most essential resource a school has (Frahm & Cianca, 2021; Horner & Jordan, 2020; Kazak, 2021; Lavy & Bocker, 2017; Tran et al., 2023) and with the ongoing decline in retention rates, addressing teacher job satisfaction has become imperative (Frahm & Cianca, 2021; Harris et al., 2019; Ingersoll & Tran, 2023; Shell et al., 2023; Sulit & Davidson, 2020; Tran et al., 2023). Administrative support is identified as the leading predictor of teacher attrition (Frahm & Cianca, 2021; Price, 2021; Shell et al., 2023; Tran et al., 2023). School principals are regarded on campus as the manager of all operations and the leaders of overall purpose (Lewis et al., 2016; Tran et al., 2023). The foundation of how each educational institution manages all the

aspects of education is the school's culture.

Often in an educational setting, the terms culture and climate are used interchangeably. Comparing culture to climate and seeing how the two words interact is the simplest way to grasp school culture. One way to think about these two concepts is that culture is part of us, and climate surrounds us. Culture is who we are, and climate is how we feel. This distinguishes clearly that while climate can change day to day, culture takes a lot of time and effort to transform (Gruenert & Whitaker, 2015).

In *School Culture Rewired: How to Define, Assess, and Transform it*, the author uses an example of a snow day. If today a school was told tomorrow would be a snow day, and the mood on campus lifted immediately and attitudes improved, the climate for the day is changed. This change in climate reflects the culture of the school, which in this example would be that they value not being at school (Gruenert & Whitaker, 2015). Staff on campus face many outside factors that affect their climate daily and often come to school with a mind full of thoughts that started at home. A school's culture is not changed by outside influences. Instead, its purpose is to get the members to trust the school's rules, systems, behaviors, and mentalities. Teachers often change the climate at the beginning of the day only to have the school culture undo all the progress they have made. "The effectiveness of a new culture depends on the strength of the people behind the change and the strength of the pre-existing culture" (Gruenert & Whitaker, 2015, p. 4).

School culture is shaped by the people within the school community and needs to be constantly reflected on to identify positive elements and reshape areas that need growth or change (Cordeiro, 2021). School vision gives all stakeholders a direction of focus in what they are collectively trying to achieve. Vision that reflects values of the teachers on campus builds organizational commitment and creates a collaborative environment. Culture provides the vehicle for realizing this vision. "Just about everything that goes on in a school is a function of the school's culture to some degree" (Gruenert & Whitaker, 2015, p.27).

The dynamics of relationships on campus mirror the underlying culture of the school. Interactions between students and teachers are influenced by the formal or informal atmosphere cultivated by the school's culture, shaping classroom communication and dynamics. Some classes are notably quiet, while others have a livelier atmosphere with students engaging actively throughout the day. The relationships among teachers themselves often hinge on the level of collaboration on campus, fostered by school leadership and the opportunities provided for staff to interact. These relationships can either strengthen unity or lead to division. Importantly, the relationships between student and staff reflect the overt tone set by administration interactions across campus, determining whether there is a cohesive team or a fragmented environment where individuals seek alternative opportunities (Price, 2021).

The most influential person in changing culture and ensuring its effectiveness is the school principal. Schools have diverse needs that depend on their unique demographics, and leadership plays a crucial role in influencing every facet of the school's functioning. The traditional role of a school's principal was more focused on the managerial tasks of budgeting, overseeing building improvements, and supervising staff. Over the last two decades, there has been a shift in the role of administrators, placing more importance on instructional leadership, and creating a strong culture (Horner & Jordan, 2020). The variety of skills that different administrators have, along with the multitude of leadership styles, cause every principal to handle daily needs uniquely. The stark contrast between administrators who foster exceptional learning environments and witness significant academic accomplishments, compared to those who struggle to foster cohesion among staff, lack a coherent vision, and grapple with cultivating effective leadership, highlights a fundamental inconsistency in the foundational training for leadership roles within educational institutions.

Statement of the Problem

As the challenge to retain teachers intensifies, research indicates that leadership within schools has emerged as the primary determinant of teacher turnover (Baker et al., 2022; Tran et al., 2023). Despite teachers' extensive subject matter expertise and knowledge of effective pedagogical practices, increasing attrition rates suggests a critical issue lies in their ability to apply this knowledge effectively within the classroom environment.

In contemporary education, teachers are expected not only to impact academic knowledge but also to nurture students' social and emotional development (Follari, 2022); however, educational policies often prioritize academic outcomes, potentially neglecting the holistic needs of students and adding to teachers' responsibilities without adequate support (Fournier, 2022; Harris et al., 2019; Ingersoll, 2001).

Furthermore, societal perceptions and expectations of teaching as a vocation characterized by dedication and sacrifice can contribute to a culture where teachers endure high levels of stress, low morale, and perceived disrespect (Fournier, 2022). These factors significantly impact job satisfaction and retention rates among educators.

Moreover, the role of educational leadership in shaping school environments cannot be overstated (Hodge et al., 2020). Leadership influences the educational culture, policies, and support systems that directly affect teacher job satisfaction and effectiveness (Harris et al., 2019; Lewis et al., 2016). Educational leadership preparation programs (ELPPs) train educational leaders, preparing them to manage schools, make decisions and prioritize tasks. Because of this there remain questions whether these programs adequately equip leaders to address these multifaceted challenges.

Therefore, this study seeks to explore the following questions:

- What aspects of administrative support, when lacking, most significantly contribute to teacher attrition?
- What are the main areas of emphasis in current ELPPs for training educational leaders?
- How do educational leaders perceive their responsibilities in fostering teacher retention and consequently academic achievement?

By examining these issues, this project aims to provide insights into enhancing educational leadership practices to improve teacher retention and ultimately foster a more supportive and effective learning environment.

Purpose of the Project

This research project aims to analyze the influence of school leadership on teacher retention and evaluate the effectiveness of ELPPs in training leaders to recruit and retain teachers. By investigating how administrative support impacts teacher attrition, the study seeks to understand the prerequisites teachers need from principals for a supportive work environment that enhances retention, and positively impacts academic achievement.

Existing research underscores that effective principals significantly decrease turnover rates (Ingersoll & Tran, 2023; Shell et al., 2023; Tran et al., 2023), while ineffective principals are identified among the primary factors contributing to teachers leaving the profession or becoming "movers," relocating to new schools (Castro et al., 2018; National Center for Education Statistics, 2024). This turnover disrupts students' learning, complicates staff collaboration, and heightens stress within school environments (Harris et al., 2019; Lewis et al., 2016; Tran et al., 2023). Despite substantial research on teacher retention, studies have scrutinized the training of educational leaders in relation to this issue.

Data from ELPPs across the United States reveals a predominant curricular emphasis on financial management, and human resources (Dexter et al., 2022). Recent shifts in education policies, such as Every Student Succeeds Act have recently put more of an emphasis on instructional leadership and transparency with parents about students' education. The Higher Education Act (HEA) has policies focused on the issues with recruitment and retention. The solutions this policy provides all focus on financial support and easier pathways for those with non-teaching degrees. These policies have little to do with the work conditions of teachers and have not had a significant impact on the current trend of teacher retention (Kuenzi, 2024; Tran, 2022). Given the persistent challenge of teacher turnover in education, this study aims to highlight the disparity between education policy demands on administration and the practical needs of schools to retain teachers, thereby ensuring optimal education outcomes for students.

Additionally, this study explores The Talent-Centered Education

Leadership conceptual framework as a potential paradigm shift for policymakers, advocating for its adoption as a guiding lens for training and directing school leadership (Tran, 2022). Given that effective leadership is pivotal in teacher retention and ranks second, only to teachers, in its impact on student academic achievement (Horner & Jordan, 2020), changing policies and practice surrounding school leadership becomes imperative.

Theoretical Framework of the Project

This study aims to explore why teachers choose to enter and leave the profession. Specifically, it will investigate teacher retention and the connection to leadership through the lens of Mason and Matas's (2015) Four Capital theoretical framework. This framework focuses on identifying the types of capital that are needed to retain teachers in schools. It allows us to recognize and analyze multiple factors that contribute to stronger teacher retention (Vaidya & Hanna, 2023). There are a variety of reasons teachers give for leaving the teaching profession. Mason and Matas's framework groups these reasons, enabling researchers to analyze which of the four capital areas requires more focus in the education system. It also helps individual administration assess where to focus their efforts to decrease turnover and, in turn, increase teacher retention. Based on extensive literature review, Mason and Matas propose that understanding the complexity of teacher retention in the education system can be achieved by examining four components of combined factors. These components are human capital, social capital, structural capital, and positive psychological capital. This framework provides insight into how one type of capital may compensate for a deficit in another, helping us determine if one capital has a stronger influence than another.

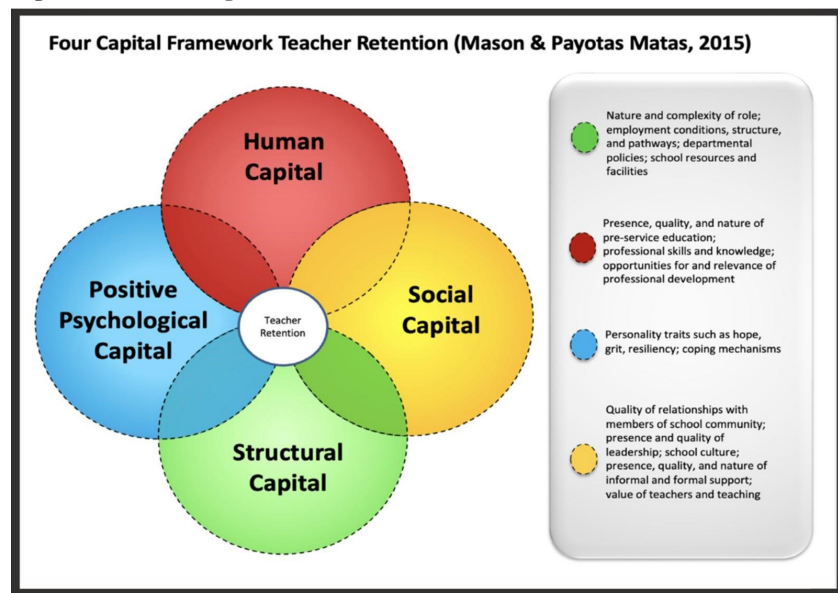


Figure 1. Four-Capital Framework for Teacher Retention (Recreated from Mason & Matas, 2015)

Human capital consists of the knowledge and skill the teacher possesses due to the education they received in obtaining their teaching credential. It also involves professional development opportunities provided to them, allowing them to gain new insight into the subject matter or teaching methods. Social capital is about relationships and how the school fosters opportunities to build new relationships on campus. This includes the school's relationship with the surrounding community, interpersonal relationships among staff and student-teacher relationships. Social capital is influenced by school culture, and whether teachers feel valued. Collaborations on campus and feedback mechanisms are also part of this component of the Four Capital theoretical framework (Mason & Matas, 2015).

Structural Capital pertains to resources and the physical spaces that schools provide for instruction. This includes factors such workload, class size, and department policies. Technological resources and funding for projects also fall within this area.

Positive psychological capital encompasses the characteristics that teachers have prior to starting their profession or developing on the job, which help them navigate the challenges of teaching. Strategies for coping with emotional and mental difficulties associated with this job are also included in this capital (Vaidya & Hanna, 2023).

The main idea behind the Four Capital theoretical framework is the overlap of the four different capitals. This implies that each area influences the others and within these four areas, there are always opportunities for administration to make improvements that can increase retention at their school. Retention sits at the center of these four areas, illustrating the need to balance the capitals to retain the most essential resource in school: the teachers. "The four-capital theoretical model argues that teacher attrition is a complex phenomenon, a product of the intersection of elements from social capital, human capital, positive psychological capital and structural capital" (Mason & Matas, 2015, p.60).

Using Mason and Matas's (2015) Four Capital theoretical framework, this study identifies the essential characteristics, knowledge, and skills necessary for leadership to enhance teacher retention. It proposes categorizing teachers' identified needs for administrative support into capitals, offering a novel approach for leadership to improve working conditions and foster conducive educational environments. Subsequently, the research will assess whether current administration preparation programs align with these factors and if the knowledge gained translates effectively into school practices (Mason & Matas, 2015; Vaidya & Hanna, 2023). It is through this lens that we study the impact leadership has on teacher retention and what areas of training administration receive from preparation programs.

Key Terms

ELPP: Education leadership preparation programs. Often these programs are a requirement for those wanting to step into a leadership role at a school in the United States. Most are done as a credential program that allows educators to have an extra credential to take on a leadership role at a school site (Dexter et al. 2022).

School Culture: refers to the beliefs, perceptions, relationships, attitudes, and written and unwritten rules that shape and influence every aspect of how a school functions, but the term also encompasses more concrete issues such as the physical and emotional safety of students, the orderliness of classrooms and public spaces, or the degree to which a school embraces and celebrates racial, ethnic, linguistic, or cultural diversity (Sabbott, 2013).

School Leadership: For this exploration school leadership refers to those that have gone through an administration preparation program. Both principals and vice principals are included in this group as well as other faculty who take on roles of leadership and have gotten their administration credentials. All these leaders facilitate principled action to achieve whole-school success (Visone, 2024).

Teacher Attrition: Attrition is the opposite of retention. Attrition is gradually making something weaker or worn down and in education it refers to teachers leaving the profession.

Teacher retention: Teacher retention is usually recorded in percentages and represents the percentage of teachers staying at their school site year after year.

Summary

This research project explores the impact of leadership on teacher retention and assesses the effectiveness of Education Leadership Preparation Programs (ELPPs) in training future administrators. Given teachers' profound impact on academic success and the increasing rates of attrition, understanding teacher retention through the lens of workplace culture is imperative. School culture permeates every institution, influencing all aspects of educational capital (Gruenert & Whitaker, 2015). Although intangible, culture is shaped by individuals and can significantly impact school dynamics.

School leadership plays a pivotal role in shaping and fostering school culture. Principals are tasked with developing and implementing a vision and mission that resonates throughout the school community. A well-crafted vision not only provides direction but also inspires teachers with purpose, fostering collaboration and meaningful relationships among staff, students and administration (Barnes, 2019). Effective leadership entails skillful management of these relationships to cultivate a positive and conducive climate on campus.

Education Leadership Preparation Programs are critical in preparing future administrators in all aspects of school leadership. Each ELPP varies in

curriculum focus and practical applications, reflecting diverse approaches to leadership training. This project emphasizes examining these program differences and evaluating how they align with the demands of educational leadership.

To analyze the complex interactions between leadership and teacher retention this study will be using Mason and Matas's (2015) Four Capital theoretical framework. This framework categorizes the factors influencing teacher attrition into human, social, structural, and positive psychological capitals. By applying this framework, the research aims to identify what teachers require from administrators and compare it with the training provided by ELPPs, establishing a cohesive analytical approach. by the ELPPs.

Chapter Two of this project delves into existing literature to explore the connection between school leadership and teacher retention. Specifically, it investigates administrative support factors cited by teachers as contributing to turnover and examines ELPPs to evaluate their training efficacy for educational leadership roles. Additionally, it introduces the Talent-Centered Education Leadership framework, as a novel perspective on recruiting and managing education professionals.

Chapter 2: Review of Related Literature

Introduction

Teacher retention has been a persistent issue in the education system since the 1930's (Darling-Hammond & Podolsky, 2019). Traditionally, policymakers' efforts to address low retention rates have focused on recruiting new teachers from preparation programs to fill the vacancies left by departing educators (Harris et al., 2019; Ingersoll & Tran, 2023; Tran et al., 2023); however, in the last decade, the number of aspiring teachers in credentialing programs has declined, causing a shortage of trained teaching professionals (Fleming, 2023; Harris et al., 2019). This continuous turnover not only disrupts instructional continuity and collaboration among teachers, but it also strains district budgets, with an average cost of \$20,000 per new hire (Carver-Thomas & Darling-Hammond, 2019). Despite these challenges, hiring new, often less experienced, teachers has served as a temporary remedy rather than addressing the fundamental causes of teacher attrition (Carver-Thomas & Darling-Hammond, 2019; Ingersoll & Tran, 2023; Tran et al., 2023).

Historically, compensation and workload have been cited as primary reasons for teachers leaving the profession (Fulbeck & Richards, 2015). However, recent research indicates a shift to broader workplace conditions and environment as significant factors contributing to attrition (Ingersoll & Tran, 2023). In a review of research studies by Shell et al. (2023) 14 studies were synthesized and from that research 23 administration characteristics were identified as indicators of teacher attrition. Multiple studies have shown

“administrative support” (Baker et al., 2022; Frahm & Cianca, 2021; Harris et al., 2019; Ingersoll & Tran, 2023; Price, 2021; Sulit & Davidson, 2020; Urick, 2020) as a primary reason for teacher attrition. In this literature review two categories are synthesized: lack of connectedness (e.g., vision, mission, direction, collaboration), and poor relationships (e.g., with administration, colleagues, students, parents) (Shell et al., 2023). This study also examines administration preparation programs and the focus of the training they receive before taking on a leadership role on campus.

Research indicates an average of 13 reasons for how leadership affects retention (Harris et al., 2019; Kazak, 2021; Shell et al., 2023; Tran et al., 2023). Studies exploring these reasons often highlight the outcome of culture implementation. A lack of shared vision in shaping campus culture has been shown to lead to disconnects, ultimately resulting in increased attrition (Tran et al., 2023). According to research, every professional relationship that teachers maintain—whether with administration, students, or parents—has been shaped by school leadership and driven by the campus culture. Key elements such as workloads, meeting schedules, and student behavior policies, determined by the administration, reflect the created culture or lack thereof. Consequently, leadership is central to the reasons teachers cite for leaving a school or the profession entirely (Buonomo et al., 2022; Harris et al., 2019; Shell et al., 2023; Tran et al., 2023).

Instead of relying solely on recruiting new educators, there is a growing consensus on the need for sustainable solutions that address the root causes of dissatisfaction and turnover (Harris et al., 2019). ELPPs is crucial for assessing whether issues with administrative support stem from inadequate training. A significant research gap exists in evaluating the effectiveness of ELPPs, particularly in understanding how well they equip administrators with the knowledge and skills needed for practical application in schools (Dexter et al., 2022). This literature review aims to investigate whether the training provided aligns with the actual needs of teachers on campus, thereby influencing retention rates. Through the lens of the Four Capital framework— human, social, structural and positive psychological capitals— this literature review explores existing research on retention. By examining how principals perceive their roles, their training experiences, and the expectations placed upon them upon school assignment, this study seeks to identify strategies to enhance teacher retention.

Shared Vision, Mission, Beliefs, and Objectives

Values guide the decisions people make in their lives. In teaching, a profession proven to be driven by a desire to help and care for students, the teachers’ values play a pivotal role. As noted by Barnes (2019), “Our sense of well-being is influenced by values” (p. 1). The vision of a school is shaped by the values embraced by its stakeholders, and from this vision, leadership creates a mission to unite students, teachers, staff, and the wider community

(Gruenert & Whitaker, 2015).

Research indicates that schools have been profoundly influenced by the demographics of the communities they serve, with notable variation between rural, urban and suburban areas. Factors such as location, school size, grade levels, socioeconomic status, and student’s demographics all have impacted the support teachers need and how schools’ function within their communities (Ingersoll & Tran, 2023). Despite these differences, one commonality has been that every community has its own unique culture. For a principal’s vision to be effective and increase retention, studies show it must resonate with and reflect the culture of the community in which the school was located (Barnes, 2019). The connectedness that a school vision creates increases the social capital on campus.

Common beliefs such as fairness, trust, respect, compassion, were key reasons why teachers remained in the profession. However, values identified by teachers as important have been absent from policies and structures shaping education (Barnes, 2019). When these values were missing from district-wide mission statements, individual site administration influenced retention by fostering a culture that embodied these values (Brown, 2021). Schools with inclusive values in their curriculum, relationships, and environment provided teachers with resilience, knowing those values were shared by all staff, students, and often the community (Barnes, 2019). According to Kazak (2021), “As long as there is a similarity between the values of the employees and the values of the organizations, the commitment to the organization increases” (p.50).

Organizational commitment refers to the level of connectedness and dedication an employee has to their job or organization (Eğinli, 2021; Lewis et al., 2016). This is greatly impacted by the organizational climate and is essential for teacher retention. A commitment to a job, group, community or cause is rooted in the culture of that organization. When people shared common beliefs about goals and how to achieve growth, it created a bond among each other and the larger collective (Kahn, 2019; Lewis et al., 2016). A healthy organizational climate is a direct reflection of a principal’s leadership. This has been shown to improve teacher performances, increase effectiveness of schools, and enhance professional development (Lewis et al., 2016).

Collaboration

Collaboration is a frequently discussed concept in various school settings. It involves working together across different groups, including teachers, administration, students and the community (Kazak, 2021). Prior research described collaboration as the sharing of knowledge, ideas, resources and struggles to enhance professional development, reduce workloads, and improve emotional well-being within the educational community (Patrick, 2022).

Collaboration is a core component of California’s educational standards. It is emphasized from 3rd grade through 12th grade in speaking and

listening areas (California Department of Education, 2013) and is also integral in physical education standards from kindergarten through high school (California Department of Education, 2006).

While teachers aim to teach students how to collaborate, a lack of involvement in decision-making and collaboration has shown to contribute to teachers leaving a school (Sulit & Davidson, 2020). Research indicated that schools were more successful when teachers shift from working in isolation to collaborating (Buonomo et al., 2022; Ezzani, 2019; Kazak, 2021). Leadership implementing areas for collaboration has shown to allow new ways for staff to build social capital. Collaborative efforts in instruction, school culture, and leadership responsibilities fostered a sense of ownership among staff, leading to greater student engagement and ownership of learning (Ezanni, 2019).

Despite the benefits, teachers have often faced limited time for collaboration due to heavy workloads. The nature and allocation of collaboration time are influenced by administration. For instance, Ezanni's (2019) case study demonstrated how a district provided a half day each week dedicated to collaboration. This time was used to implement Professional Learning Communities (PLCs), which positively shifted the school culture. Leadership used common language PLC questions to reinforce shared values among staff (Ezzani, 2019).

Schools with strong collaborative practices experienced effective professional development and studies show that staff at sites with these communities shared collective responsibility for student growth, which led to a higher professional satisfaction, and improved retention rates (Lewis et al., 2016).

Distribution of Duties and Teams on Campus

Shared responsibilities are common in education due to the diverse needs on campus that often fall outside individual job descriptions. Building a community of teachers rather than working as isolated individuals has helped leadership address needs without overwhelming their schedules (Ezzani, 2019). Teams formed to address specific needs have been known to effectively monitor, discuss and implement practices or systems. As Ryan & Loughland (2020) noted, "Teams running together will achieve goals, and I think often we can lose sight of that" (p. 685). Distributing leadership opportunities has shown to increase all four capitals. Human capital has shown to increase when teachers have taken the roles of mentor for beginning teachers. Teachers that take on leadership roles in areas that they possess knowledge or skills have shown to increase self-efficacy which increases positive psychological capital (Jentsch, 2022).

Research on distributive leadership showed responsibilities are often distributed formally or informally. Research suggested that formal distribution requires awareness of teachers' preferences to avoid perceptions of micro-management or increased workload. Informal distribution, where teachers

take on roles based on their skills and interests, has fostered a collaborative culture and enhanced the vision and culture on campus (Sulit & Davidson, 2020)

The TCEL framework emphasizes recognizing and utilizing individual teachers' talents to create a talent-rich community that encourages staff ownership (Tran, 2022). The attributes shown in distributive leadership combined with the proposed solutions in TCEL framework show a possibility to positively impact retention (Sulit & Davidson, 2020; Tran, 2023). When teachers were given some ownership on campus and administration acted in ways that showed they valued their staff, job satisfaction increased, raising teacher retention rates (Sulit & Davidson, 2020).

Delegating responsibilities and allowing teachers to manage tasks demonstrated trust and respect. Shared responsibilities enhance organizational commitment and increase retention (Urlick, 2020). Transformational leadership, which began in the 1990's as a response to increased accountability and the need for improved academic outcomes, promoted organizational changes and built mission and community (Urlick, 2020). This leadership style has shown to empower teachers, allowing them to take on leadership roles and contribute to a focused vision (Menon & Lefteri, 2021).

Studies show that when administration empowered teachers to take on some of the leadership roles it decreased the workload of the principal which allowed for time to be spent on operational tasks and providing resources which increased structural capital (Urlick, 2020).

Perception and Expectations

Misperceptions and unclear expectations are well documented issues in work environments, particularly in educational settings. A study by Harris et al. (2019), revealed significant discrepancies in the perceptions of school leadership and the actual experience of teachers. This research explored how different stakeholders—parents, principals, and k-12 teachers—viewed workplace conditions and how these perceptions influenced teacher attrition. This study utilized surveys to uncover these different viewpoints, highlighting substantial gaps between teachers' and principals' responses. For instance, while 92% of principals believed their campuses fostered a trusting and supportive environment, only 53% of teachers shared this sentiment. Additionally, 89% of principals felt that teachers had a say in decisions affecting them, whereas only 39% of teachers agreed. These findings underscore how teachers' perceptions of their involvement in decision-making were closely tied to their sense of a supportive and trusting environment. Therefore, this study illuminated a disconnect between administrative perceptions and staff experiences, indicating a broader issue with the organizational culture that negatively impacted the working climate for teachers (Harris et al., 2019).

Beyond administrative perceptions, societal views on the teaching profession also have shown to play a crucial role in teacher retention. Educators

are often compared to healthcare and public service professionals, seen as driven by a profound sense of purpose and care (Barnes, 2019; Buonomo et al., 2022). While this idealized view has shown accuracy in the reasons teachers have given for beginning in the profession, it can complicate the realities of teaching (Fournier, 2022). The public's perceptions of educators as naturally selfless, can increase misunderstandings about their needs and work conditions (Fournier, 2022; Harris et al., 2019). Tran (2022) and other researchers (Barnes, 2019; Fournier, 2022; Harris et al., 2019; Tran et al., 2023) have shown that these societal misperceptions can lead to environments where teachers' emotional and social needs are inadequately addressed. The gap between societal expectations and the actual support provided often results in unmet needs, contributing to teacher dissatisfaction and attrition.

Another crucial aspect of administrative support is the alignment of expectations between administration and teachers, a factor identified as highly significant (91%) by teachers themselves. However, research by Harris et al. (2019) revealed a notable disconnect: while 56% of administrators believed their expectations were reasonable, only 20% of teachers agreed. This discrepancy is closely linked to concerns about teacher workload and preparation time (Harris et al., 2019). Teachers frequently report that mandatory meetings and collaborative sessions often consume their preparation time with topics that they perceive as unhelpful for their instructional needs (Tran et al. 2023). This misalignment results in teachers feeling overwhelmed by the numerous objectives they must meet throughout the school year, with their preparation time often redirected to meetings that do not enhance their teaching effectiveness (Patrick, 2022). Consequently, teachers experience a lack of autonomy in their teaching and feel their voices are not adequately heard, further compounding their dissatisfaction with their work environment (Sulit & Davidson, 2020). These misperceptions and expectations lead to damage in the interpersonal relationships on campus, lowering the social capital among staff (Harris et al., 2019).

Relationships

Relationships are fundamental to a teacher's job satisfaction. As Buonomo (2022) notes, "The teaching profession is inherently relational, as it is pursued within an intricate web of relationships with administrators, principals, colleagues, students and their families" (p. 3). Compassionate and supportive relationships with students, colleagues, and administrators contribute to a positive work environment, help prevent burnout, and increase teachers' organizational commitment (Buonomo, 2022). Teachers are known to have a profound desire to contribute to society and these relationships are a key avenue for fulfilling this desire. The impact of these relationships fosters self-efficacy and enhances positive psychological capital (Seelig & McCabe, 2021). Effective leadership, which prioritizes understanding and supporting teacher's

needs, is crucial in fostering these vital relationships.

Teacher-Student Relationships

Research indicates that experiencing a sense of meaning at work is linked to higher organizational commitment. Lavy & Bocker (2017) examined the impact of this sense of meaning on the student-teacher relationship and its influence on job satisfaction. Their findings suggest that teachers often enter the profession with a desire to impact their students positively. For many teachers, student outcomes are a significant source of meaning in their work (Lavy & Bocker, 2018). In rural communities, where funding and resources are often limited and teachers often juggle multiple grade levels due to low staff numbers, relationships with students have been identified as a key factor contributing to job satisfaction (Seelig & McCabe, 2021).

In these rural settings, the connection teachers establish with students—and by extension, with their families—leads to greater organizational commitment. This highlights the reliance on social capital within these communities. The investments teachers make in their relationships with students enables them to address needs beyond academic outcomes: "...the emphasis was consistently on having the ability to address student needs or interests—not specific academic outcomes" (Seelig & McCabe, 2021, p. 7).

Moreover, research suggests that schools that invest in social capital can mitigate some causes of attrition and improve teacher retention. One approach that schools have used to foster relational engagement is the creation of extracurricular programs led by staff. These programs, which focus on both skills' development and additional learning opportunities, help to strengthen student-teacher relationships. This personalization of learning experiences builds trust between students and teachers, thereby enhancing students' self-efficacy (Lewis et al., 2016). Increased self-efficacy in students contributes to a teachers' sense of fulfillment, creating an environment that supports higher retention rates (Barnes, 2019).

Teacher-Teacher Relationships

"Caring professions" (Barnes, 2019, p. 10) such as teachers, nurses, and police tend to attract people who desire careers that are all about human interactions. Jobs that make emotional and valuable connections between people are centered around traits like kindness, fairness, trust, and compassion (Barnes, 2019). Research has shown when teachers feel there is a sense of community among the staff at school the rate of retention increases. When staff experience a community, reminiscent of family, on campus, turnover is prevented (Seelig & McCabe, 2021). In studies done within a smaller community the lower number of staff created a level of intimacy that was acknowledged would be difficult in a bigger school setting (Lewis et al., 2016; Seelig & McCabe, 2021). This research indicates that creating a tight knit community even with a larger number of staff is essential when trying to increase reten-

tion (Lewis et al., 2016). In Sulit & Davidson's (2020) study on distributive leadership it is explained how this type of leadership is the result of cultivating relationships among staff by dispersing leadership in a way to allow teachers to become a part of school improvement and create a school community on a regular basis.

Leadership-Teacher Relationships

Administration has many responsibilities on campus, which can be compartmentalized into sections such as managerial, instructional, transactional, and transformational (Urlick, 2020). Research shows the priority administrators have given to these tasks and how they have delegated roles on campus directly affected the relationships they have with staff (Urlick, 2020). Balancing these tasks in their schedule allows them to contribute to each type of capital that the teachers need to feel fulfilled and increase their organizational commitment to the school. Often, managerial tasks involved meetings both on and off campus, leaving little time for their presence to be felt on campus. These tasks are useful to build the structural capital on campus and can improve retention in high needs schools (Tran et al., 2023); however, while this was once viewed as the primary focus for all administration, current principals are required to create culture on campus, become instructional leaders, and create meaningful relationships among staff (Frahm & Cianca, 2021). Effective school leadership requires good relationships with the teachers and an understanding of their most important needs.

Administration's knowledge of their staff begins at the hiring process. When teachers are hired because their qualifications and values align with the school's needs and the culture the administration has implemented on campus, they are less likely to need instructional guidance and have more autonomy in their teaching (Seelig & McCabe, 2021). Research indicates when teachers felt they could make decisions about pedagogy and curriculum they felt supported and respected.

Instructional leadership is one area where perceptions of administration and staff differ greatly. These differences in perceptions break down the relationships that administration is trying to cultivate with their staff. Teachers rank lack of respect as one of the highest reasons for attrition. Feeling respected connects to many other reasons for leaving and is something that principals often feel they are providing, yet their staff feel is severely lacking. When administration provides instructional support, teachers often feel a lack of autonomy and trust in their abilities to do their job. Instructional leadership is only effective when the voices of teachers are heard by administration and used to determine what instructional support, professional development, and resources are needed. In Seelig & McCabe's case study (2021) examining rural teacher retention, multiple teachers interviewed are cited as acknowledging that while they may have more responsibilities because of smaller staff, com-

mittees matter because their voices are heard and as a result action is taken. Having an open-door policy and showing concern for the well-being of the staff builds a relationship that is based on trust and respect. The simple task of connecting with teachers as people and letting them know they are valued has shown to increase teacher retention (Tran et al., 2023). These acts of support by the administration add to the social capital that teachers have on campus. Principals can benefit schools by being mentors to their teachers. "Formal mentorship from the principal as well as feeling supported by one's principal prove to be approaches to reduce feelings of isolation, increase integration into the school community and heighten sense of worth among teachers" (Price, 202, p. 494) The connection formed through mentorship can deepen the relationship between principals and teachers. This will help with the power imbalance that often makes teachers feel that the interest principals have in them as people is not genuine. Support without relationship is often perceived as micromanagement and lack of belief in the teacher. When teachers do not feel connected to leadership and valued, they lack self-efficacy and their desire to become part of leadership themselves goes down.

Educational Leadership Preparation Programs

All school administration typically has come from a background as former teachers and have undergone specific training before assuming leadership roles (Bastian & Drake, 2023). Research highlights that, after teachers, principals exert a significant impact on student outcomes (Bastian & Drake, 2023; Horner & Jordan, 2020). However, ELPPs vary widely across states in the U.S., differing in curriculum and the extent of practical application (Bastian & Drake, 2023; Dexter et al., 2022). Although these programs have been studied for decades, much of the research has focused on developing inquiry lines, conceptual frameworks, and identifying key characteristics (Dexter et al., 2022).

Studies categorize ELPPs into two main types: traditional and non-traditional. Traditional programs are typically university based with minimal internship components, while non-traditional programs integrate university curriculum with in-person experience in k-12 school (Horner & Jordan, 2020). Research indicated a gap between preparation and the realities of school administration (Horner & Jordan, 2020; Dexter et al., 2022). Both school districts and universities seek to bridge the "preparation-practice divide" (Horner & Jordan, 2020).

Horner and Jordan (2020) argued for a partnership between school districts and university instructors to improve ELPPs. They suggested that such collaboration could enhance curriculum development, internship planning, and real-world support. Research showed that non-traditional programs often outperform traditional ones, though the push for these programs is sometimes driven more by educational reform rather than improvements in leadership training (Horner & Jordan, 2020). non-traditional programs

benefited from real-world experiences and interactions between future leaders and current practitioners (Horner & Jordan, 2020).

Dexter et al. (2022) conducted a study examining 600 U.S. ELPPs to assess principal training focus and the link between theoretical learning and practical school preparation. Their findings revealed outdated curricula, with only three out of twelve competencies receiving full class attention, while nine rely solely on assignment spread out between other classes (Dexter et al., 2022). This study suggested a need for curriculum restructuring, as current training focuses heavily on areas of human and structural capital but are completely absent of any training in building social capital (Dexter et al., 2022; Mason & Matas, 2015). The literature highlighted difficulties in defining quality within ELPPs and reveals a disconnect between administrative support perceptions among teachers and leaders (Bastain & Drake, 2023; Harris et al. 2019). The path to leadership in education often begins with teachers, with 90% reporting encouragement to pursue a leadership role (Bastain & Drake, 2023). This suggests most leaders have firsthand experience of the teaching profession. Therefore, discrepancies between teachers' and administrators' perceptions likely arise from inadequate training and pressures placed on administrators by districts.

The Talent-Centered Education Leadership (TCEL) conceptual framework proposes that misperceptions between administration and teachers stems from outdated policies affecting training, leading principals to view teachers as resources rather than partners in student achievement (Tran, 2022). TCEL advocates for an employee-centered environment, recognizing that each community, school, and teacher have unique needs requiring tailored support (Tran et al., 2023). Research shows that teachers' job satisfaction, which is closely linked to students' academic success, could be enhanced by improving working conditions and addressing specific needs (Barnes, 2019; Lavy & Bocker, 2017; Tran, 2022).

Summary

Administration plays a crucial role in teacher retention and satisfaction. Effective administrative support encompasses behaviors, skills and knowledge essential for teacher effectiveness and job satisfaction. This literature review categorizes these supports into “connectedness” and “relationships.” Research suggests that a safe, trusting environment, and a clear, shared vision are key to enhancing teacher retention (Tran et al., 2023). A well implemented vision aligns the values and creates a supportive culture, while collaboration and communication reduce misperceptions and unmet expectations (Harris et al., 2019). Respect, a common theme in both categories of administrative support, is crucial in fostering a positive environment and reducing turnover costs (Tran et al., 2023; Tran, 2022).

School administration typically consists of former teachers, who have

undergone specific training. ELPPs vary greatly across states, with non-traditional programs often outperforming traditional ones, due to their integration of real-world experiences. Research suggests that improved collaboration between school districts and universities could address these gaps, while framework like TCEL advocate for a more supportive environment for teachers to enhance job satisfaction and student achievement.

Chapter 3: Implications

Introduction

Low teacher retention remains a critical problem in the US education system, significantly impacting our public schools' ability to effectively educate students and contribute to their communities (Frahm & Cianca, 2021; Harris et al., 2019; Ingersoll & Tran, 2023; Shell et al., 2023; Sulit & Davidson, 2020; Tran et al., 2023). As the challenge to retain teachers intensifies, research indicates that leadership within schools has emerged as the primary determinant of teacher turnover (Baker et al., 2022). Over decades, research identified various factors contributing to this challenge, with recent studies highlighting administrative support—or its absence—as a key reason for teacher attrition (Frahm & Cianca, 2021; Price, 2021; Shell et al., 2023; Tran et al., 2023). While compensation and workload have historically been primary concerns among educators, recent findings underscore the pivotal role of supportive leadership in enhancing retention rates (Fulbeck & Richards, 2015; Harris et al., 2019; William et al., 2022). This research project aims to analyze the influence of school leadership on teacher retention and evaluate ELPPs to determine their efficacy in training leaders to recruit and retain teachers.

This project provided a detailed examination of administrative support, exploring its specific characteristics and its alignment with the ELPPs in the United States. Research findings indicate that the concept of respect emerges prominently among reasons given by exiting teachers and “movers” those who transition between schools (Tran et al., 2023). It reveals that while the needs of teachers vary across different demographics, social capital emerges as a crucial factor in retaining educators. Teachers express a strong desire to feel valued by their administration, highlighting the significant impact of campus relationships on their workplace satisfaction.

The research introduced a framework that can be used to change how teachers are valued and treated within the education system. TCEL is a conceptual framework focused on how teachers are perceived and treated in the workplace. This framework directs research towards human resources, policy, and reforms.

Furthermore, the study identified a notable disconnect between the training curriculum offered by universities and the practical needs of principals on campus. This disparity was evident in both the focus of the prepara

tion program and the limited collaboration between district mentors and university instructors (Horner & Jordan, 2020).

Conclusions

This analysis highlighted administrative support as a significant factor influencing both teacher retention and attrition across various research findings. Teachers will overlook other significant factors and remain in the profession when they feel supported by and have a positive relationship with their administration (Harris et al., 2019; William et al., 2022). Conversely, dissatisfaction with administrative support often emerges as a primary reason for leaving, as indicated by responses from questionnaires and interviews (Tran et al., 2023). Teachers are widely acknowledged as schools' greatest resources due to their subject matter expertise, underscoring the importance of creating environments where educators feel valued for their contributions to student success.

Across all educational settings, with student success as the overarching goal, each school fosters a unique culture that shapes interactions among staff, students, administrators and the greater community. In settings where the culture may seem disconnected or difficult to define, this lack of defined culture negatively impacts teachers' ability to enhance academic achievement for students. Rather, a cohesive school culture clarifies roles and expectations for all stakeholders, empowering teachers to excel in their educational roles (Gruenert & Whitaker, 2015). Teachers often perceive the current educational culture to value the academic success of students more than the students themselves. Finding meaning in their work and sharing values such as trust, kindness, perseverance, and community positively impacts retention, and enhances teachers' resilience (Barnes, 2019). Aligned values enable educators to stay committed to their initial motivations for entering the teaching profession. Conversely, perceived lack of values and support from administration can lead to increased teacher turnover or career changes. When teachers feel unsupported or undervalued, their motivation and satisfaction decline, prompting them to seek communities where their contributions are appreciated and recognized (Tran, 2022).

A deeper examination of administrative support reveals that each school functions as its own community with specific needs influenced by its surrounding demographics (Ingersoll & Tran, 2023; Seelig & McCabe, 2021). Respect emerges as a critical factor across all communities, significantly impacting staff satisfaction and support. The research consistently underscores teachers' desire for relationships on campus to have mutual respect and trust. Respect serves as a foundational element from which all other reasons for retention stem. When teachers feel respected, they experience autonomy and receive the necessary resources. Respect fosters open communication and appreciation. Instructional leadership under a framework of respect feels

like coaching or collaboration rather than micromanagement. Respect from administration sets a tone that extends to student behavior, creating an environment where daily demonstrations of respect for teachers are evident (Tran et al., 2023). When all the research compiled on the different administrative support is synthesized, the problem causing low teacher retention is clearly not about what the administration does but how the larger education system sees teachers as a resource to take from rather than a human to support. When administrators view their staff as talented contributors to a unified community guided by core values, they create an environment where teachers not only stay but thrive, ultimately boosting academic achievement for the school (Tran, 2022).

Historically, within education, some reforms have treated teachers merely as resources to be managed to meet organizational needs. The TCEL framework, if used, will change the way districts run their human resources department and when districts are resistant, administration needs to use TCEL to hire staff that fit into their culture rather than filling a spot. By prioritizing teacher satisfaction over student outcomes, organizational commitment increases, thereby improving retention. TCEL implementation allows leadership to view staff as talent in which to foster growth and success, which results in success for the school.

The Mason & Matas (2015) Four Capital framework is a phenomenal way to categorize the support teachers need from administration across human, social, structural, and positive psychological capital domains (Mason & Matas, 2015; Vaidya & Hanna, 2023). Examination through these lenses reveals deficiencies in one or more capital areas contributing to teacher attrition. Social capital emerges as a common factor, with feelings of connection and value recurring in the data. While all four capitals identified in the Four Capital framework have been highlighted in various research as significant factors contributing to teachers' decisions to leave the profession, research also revealed that leadership is focusing too much time on increasing human capital by having profession development or meetings focused on improving teachers instructional knowledge; however, teachers clearly indicate they feel micromanaged often by this because of the lack of social capital on campus (Tran et al., 2023).

The research emphasizes how current administrative focus on academic achievement and student success often overlooks creating environments conducive to teacher excellence. The preparation of principals combined with district level directives both primarily geared towards improving student outcomes, leaves principals facing challenges in fostering optimal conditions for teacher performance (Tran, 2022; Dexter et al., 2022). This conclusion arises from teacher responses and examination of the ELPPs coursework. ELPPs indicate significant emphasis on managerial tasks and instructional leadership; with less focus on vision, culture, and relationships-building (Dexter et al., 2022). This lack of emphasis on social capital in leadership training contributes to high teacher dissatisfaction rates, highlighting the need for administ-

ration to prioritize creating supportive working environments where educators feel valued for their contribution to the education system.

Teachers start in their career because of a desire for purpose and human connection (Fournier, 2022). Teachers are frequently motivated by inspiration, encouragement, and previous experience with teaching or working with children. They thrive to excel in their roles, aiming ultimately to foster academic achievement among their students. If leadership saw the main objective of their job as providing and caring for staff, trusting teachers to help students achieve academic success, teacher retention would improve. If they prioritized making sure the staff have a healthy, safe and enjoyable workplace over test scores or assessments, the results of the test scores would improve over time because staff would have all they need to do their job to the best of their ability.

Practice Implications

In practice, the research emphasizes that retention is directly linked to staff satisfaction with school workplace conditions. The research highlighted that feeling valued and respected equates to feeling supported by administration (Iran et al., 2023). Teachers identified administration as pivotal in enhancing school environments, suggesting that establishing a values-based vision and culture can influence staff commitment (Barnes, 2019). Respect is what a teacher feels when their needs are being met (Iran et al., 2023).

Administrators can use the Four Capital framework to identify areas of capital in which their school has a surplus and areas of capital that are showing depletion. This will help them to generate ways to improve the environment on campus by investing time and energy into increasing capital in areas that are low. For instance, in rural communities where social capital thrives due to strong teacher-community connections, challenges arise from limited structural resources due to factors like low enrollment and funding constraints. In these communities the administration must find ways to improve structural capital often without the funding available (Seelig & McCabe, 2021).

Addressing these challenges requires a transformation in the preparation programs for training administration. Research showed that ELPPs need a shift in both focus of curriculum and application of the training. Future administration needs more time on campus which suggests internships or practical hours would be a best practice for ELPPs. Extending the amount of time future administrators spend on school campuses can give better insight to practical needs of the schools they will lead (Horner & Jordan, 2020). This approach provides deeper insight into school needs and better prepares leaders to utilize frameworks like the Four-Capital model to support teachers and assess campus culture effectively.

Ultimately coursework geared towards creating a cohesive campus vision, and culture ensures that educational leadership training aligns with prac-

tical school needs thereby enhancing overall school climate and support for teachers. Having all other coursework viewed through the lens of school culture would give administration a practical way to view problems or workload demands once they begin their career as a principal.

Policy Implications

TCEL represents a transformative approach to policy and reform, redefining the role of teachers from a resource to be used, to an active contributor in achieving academic success. Current policies often rely on old business practices such as incentives and penalties to compel desired outcomes from educators (Iran, 2022). This approach suggests that teachers are driven by financial rewards and fear of job insecurity rather than a desire to make a meaningful impact and help students thrive in society. These implications contribute to the unattractiveness of the teaching profession, resulting in a decline in new teacher recruitment.

Policies must shift focus towards reshaping educational leadership to prioritizing employee satisfaction and support. Research highlights that insufficient administrative support contributes to high teacher attrition rates, emphasizing the need for policy changes that recognize teachers' commitment to students' success and foster public appreciation for their crucial role. Aligning leadership responsibilities with teacher support rather than just academic outcomes acknowledges teachers' significant influence on student achievement.

Effective policy must also address ELPPs, recognizing administrators' pivotal role in teacher retention and consequently student achievement. Standardizing ELPP requirements, particularly in terms of on campus training and curriculum, enhances administrators' understanding of school realities and improves their effectiveness (Dexter et al., 2022). Bridging the gap between preparation and real-world district challenges is essential, requiring diverse program models that incorporate substantial on the job training and feedback mechanisms (Horner & Jordan, 2020).

Furthermore, integrating TCEL and Four Capital framework in policy can revolutionize leadership roles on campuses and enhance understanding of school needs. By training leadership to focus on their staff and equipping them with tools to assess and address capital deficiencies, policy can significantly improve retention rates and ultimately enhance educational outcomes.

In summary, policy initiatives that embrace TCEL, prioritize teacher support, reform ELPPs, and integrate the Four Capital framework are essential for fostering a supportive educational environment that attracts and retains talented educators committed to student success.

Direction For Future Study

The limitations identified in this literature review highlight the need to look deeper into two key areas: administrative support and the application of the TCEL and Four Capital framework. Exploring administrative support

further can pinpoint specific areas where Education Leadership Preparation Programs might need to devote more coursework or incorporate practical experience through district-connected internships. Additionally, more research is needed to examine how effectively these frameworks are currently used in schools. Testing their strategies could provide insights into whether shifting leadership focus and adopting new assessment strategies for campus environments can improve teacher retention rates.

Administrative support emerges as a critical factor in teacher attrition, yet there is limited research categorizing the specific capitals (human, social, structural, and positive psychological) that contribute to teachers feeling supported. Further investigation could focus on schools with high retention to identify leadership attributes associated with each capital category. Increasing research on ELPPs from the perspective of the Four Capital theoretical framework would reveal if training adequately covered all capitals or if certain areas receive insufficient attention.

Overall, future research on teacher retention should emphasize teacher outcomes, and the factors influencing those outcomes. Studying the workplace environment in education could lead to practical changes in policy and practice that positively impact teacher retention. Moreover, exploring methods for selecting educational leaders based on TCEL principles, rather than solely on seniority or availability, could help districts identify and nurture talent, aligning individuals with broader educational visions.

In conclusion, future studies should aim to deepen understanding of administrative support, refine the application of TCEL and the Four Capital framework, and explore innovative approaches to educational leadership preparation. These efforts are crucial for fostering supportive school environments and improving teacher retention rates.

Summary

This literature review examined how leadership impacted teacher retention. This was viewed through the lens of culture with the hypothesis that culture impacts every aspect of a teacher's job. Using the Four Capital theoretical framework the reasons for attrition were divided into four capitals. Culture was shown to impact human, social, structural and positive psychological capital. Teacher retention affects schools in all demographics and causes more job vacancies than teacher retirement (cite). Turnover has always been a factor in the education system with reasons varying from compensation, workload, burnout, relocation, and issues with leadership. The latter has become the most prevalent reason for attrition in recent years (CITE).

In the past policymakers have tried to overcome the rising teacher attrition with improved compensation, breaks on educational costs, alternative teacher credential programs, and recruiting new hires. These strategies have not shown to make a significant decrease in attrition because they are not the

problem with the education system that is causing the mass exodus. When looking at the reasons cited in research by teachers as the cause of their decision to leave the profession, you can clearly see the capital that is depleted at different locations. In rural areas there often is a need for more human and structural capital, as the identified needs were more resources, higher compensation, and offerings of professional development or further education. In urban areas there are needs for more social and positive psychological capital as communication and collaboration are necessities as well as characteristics such as grit and resilience. In suburban communities' social capital is frequently cited as reasons for attrition, as acquiring and maintaining high academic results make teachers feel unappreciated, ignored, and undervalued. These areas often have more parent involvement and staff have cited the feeling that the administration gives more focus to parents than teachers. These capitals were all found in the research and described in the literature review.

Social capital was connected to all factors of administrative support that teachers felt were lacking, causing attrition. Creating a vision for all stakeholders at a school is essential in immediately forming common goals which helps create community. From this vision stems a culture that when created from values like respect, trust, appreciation, and collaboration has been shown to have a positive impact on teacher retention. Collaboration was another factor that showed a positive impact on teacher retention.

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Impact of Project-Based Learning on Student Efficacy in STEM Courses

Kateryna Gupalo

Abstract

The increasing demand for Science, Technology, Engineering, Mathematics (STEM) education in the twenty-first century, along with a noticeable decrease in student efficacy in STEM courses in developed Western countries in the post-pandemic years, has prompted educators to seek for more effective instructional methods for teaching STEM. The aim of this literature review is to examine the impact that implementation of Project-based learning (PBL) can have on student efficacy in STEM courses. According to the research, some of the benefits of implementing PBL in STEM courses on student efficacy include increased student engagement and motivation, relevance to real-world experiences, promotion of essential skills for 21st-century learners, and PBL's alignment with UDL's inclusiveness principles, which promote equitable learning. Policies that can be implemented include increasing school financing for PBL-based STEM courses, requiring aspiring educators to complete STEM teaching preparation courses with an emphasis on PBL implementation in teacher preparation programs, and building a strong STEM curriculum incorporating PBL. Suggestions for future research include data on achievement in STEM schools versus PBL-based STEM schools, a study to determine whether PBL has a more positive learning outcome for all students than the traditional model of learning, and an investigation into the effects of PBL in primary education, where research has shown a shortage.

Chapter 1: Introduction to the Project

Background

The field of education is full of studies, experiments, and theories that attempt to explain how people learn best while also focusing on the unique learning needs and preferences of each individual. Project-based learning is the practice of involving students in their learning tasks by including a physical model in the form of a project in the learning process. It is also a teaching method that uses complex real-world problems to promote student learning of concepts and principles (Sprenger, 2020). The origins of the idea of hands-on learning can be traced back to the early Greek philosophers such as Socrates, Aristotle as well as the American philosopher Jeromy Bruner who all believed in student-centered education and that students learn best through

collaborative work and interaction (Kim & Kim, 2021). The official name for the learning approach, "Project-Based Learning" (PBL) was first introduced at McMaster University in Canada in the 1960s as a medical approach to learning, and later in the 1980 and 1990s, PBL was adopted by the American public schools (Wijnia et al., 2024). Twenty-first-century educators have refined the approach to suit the K-12 education system with a focus on equipping students with the needed skills to solve real-world problems, as well as develop as critical thinkers and communicators (He et al., 2023; Rehman et al., 2023). While many studies supported the effectiveness of PBL and its impacts on student motivation and efficacy, on the contrary, other studies have shown that it had an impact on student creativity and critical thinking skills, collaboration, and better academic performance. According to researchers and education scholars, more research is allegedly necessary to validate the claims and achieve a consensus regarding the efficiency of PBL in increasing student efficacy.

Statement of the Problem

When students lack motivation and interest in their studies, it becomes difficult for educators to ensure they acquire all of the knowledge and skills mandated by the Department of Education. This problem has become even more prominent in the post-pandemic years when educators noticed a decline in motivation over the past 20 years, specifically in developed Western countries (Li et al., 2023). As with most cases linked to performance, there is a link between student engagement and student academic achievement. Furthermore, statistics from the National Center for Education Statistics (NCES) card report 7 points drop in mathematics nationwide, referring to this drop as the first ever drop in mathematics scores. By identifying effective learning strategies that sustain students' interest while facilitating the acquisition of essential academic knowledge and skills, and assessing instructional effectiveness, important adjustments to the delivery of content can be made with emphasis on increasing student efficacy. With the primary goal of engaging students in their learning, educators, and specialists are in search of pedagogical methods that would allow students to be more active during their learning tasks and show more initiative in their academics. It is crucial to find effective solutions for prompt changes to occur. If educators will be unsuccessful in finding effective ways of increasing student efficacy in STEM subjects then students will not be meeting the required learning standards and will not be prepared to be productive members of the twenty-first-century world (Rehman et al., 2023).

Purpose of the Project

This research aims to examine the impact of PBL on student efficacy in STEM courses. This project will focus on examining whether PBL can be considered an effective learning approach for increasing student efficacy and will explore the potential impacts on student motivation when practicing PBL in mathematics and science courses. Educators must be aware of the effect

that a teaching approach has on their students to be able to reflect and make adjustments in their teaching approaches, which can include increasing the use of this approach due to its proven effectiveness or limiting the use of this approach due to its failure to produce the desired outcomes. While many studies point out the benefits of PBL for student's learning, there is still a lack of common consensus on its effectiveness. Furthermore, this research will examine how PBL can help increase student academic achievements by increasing motivation. This will be accomplished by reviewing the literature to get an insight into the opinions of students and their educators towards PBL and ways to make the practice of PBL more effective in the classrooms. Another focus of this project is on the specific impacts that the use of the PBL approach has made on student performance in STEM courses. This research will also explore the question of equity in the PBL approach as an educational learning tool to determine whether or not it provides all students with equal access to learning. The field of education must get a firm understanding of the impacts that PBL has on student efficacy in STEM courses to be able to effectively engage students in education and close the learning gap while providing students with approaches to learning that have proven to be effective.

Theoretical Framework of the Project

PBL has roots in the Constructivist Theory which was proposed and studied by one of America's most prominent educational theorists, Bruner. Bruner's Constructivist theory was developed based on Piaget's Cognitive Theory. Both theorists believed in the importance of cognitive development in children, placing a big emphasis on the idea of social interaction as a vital part of learning. Unlike Piaget, whose primary focus was on individual thinking, Bruner believed that children's cognitive development is most effectively developed through continuous social interactions and guidance from more knowledgeable peers and adults and wanted to "make education relevant to the needs of students at all levels" (Rafiq et al., 2023, p.666). The constructivist theory is a process where learners "actively construct their knowledge and seek meaning" (Shah, 2019, p.3). What the learner knows before conducting the hypothesis plays a significant role in the link between the prior knowledge and the new knowledge. The goal of Constructivism is to "transition learning from a passive recipient to an active participant" (Shah, 2019, pp. 4-5). An important aspect of cognitive development in Constructivism is the construction of knowledge through the exchange of ideas, and perspectives, as well as an articulation of problems. It is important to understand that Constructivism does not take away the active role of an educator in the classroom, and by all means stresses the importance of teacher competence in the subject matter and warns about the extremes and misconducts where students' needs and interests are being marginalized (Shah, 2019, p.8). Since genuine learning occurs when students are active learners, modern educators have turned to instructional approaches that allow students to apply their knowledge in meaningful.

ways.

One of the first instructional approaches that allowed students to process their knowledge and apply it in meaningful ways was Inquiry-Based Learning (IBL), a pedagogical method that stemmed out of Constructivism. IBL is a student-centered approach that focuses on students' critical thinking, problem-solving, as well as communication skills which all work together to deepen students' level of understanding of the content knowledge. PBL was developed to be a method of IBL consisting of a student-centered education where teachers serve as facilitators and students are given full autonomy over the given task (Eckardt et al., 2020). The key principles that PBL inherits from IBL are a need for relevance, the ability to transfer the retained knowledge, as well as student's ability to creatively produce a realistic product, factual knowledge, as well as demonstrate their ability to demonstrate problem-solving skills. PBL is a pedagogical approach that takes instruction one step further and focuses learning around a specific project that helps students demonstrate their understanding by applying their knowledge. Another common key attribute that both pedagogies share is the significance of adjusting to the needs of 21st century students which consists of building competencies, as well as preparing students to be able to adequately meet the demands and expectations of the future (Rafiq et al., 2023).

Basing its foundation in the educational theory of a famous and well-recognized theorist, Bruner, and his emphasis on moving away from simply reciting facts to constructing knowledge, PBL therefore also advocates for student active learning. With technology advancing at higher rates than ever, the educational system will need to evolve accordingly to be considered effective and meet the needs and interests of twenty-first-century students. In addition to meeting the social interaction skills that Constructivism emphasizes the importance of, PBL is a pedagogical approach that accepts the challenge of answering one of the most common questions that twenty-first-century students ask "Where will I need this knowledge?" In a world where technology can be easily accessed, PBL gives it the potential to become a tool that can help students demonstrate and apply their knowledge. Since PBL came as a result of the Constructivist approach to education, it continues the inherited idea of the need for relevant, meaningful, and active construction of knowledge.

Definition of Key Terms

The definitions of the important terms will help to make clear their intended meaning and provide basic vocabulary knowledge related to the issue.

Project-based learning (PBL): is a pedagogical method consisting of active, student-centered instruction and involves "exploration of real-world problems and challenges for students to acquire a deeper level of learning" (Eckardt et al., 2020).

Projects are used in this method for students to demonstrate their knowl-

edge by applying problem-solving, communication, as well as critical thinking skills with an emphasis on “learning by doing”.

Student Efficacy: according to social theorists is a “belief and confidence in completing a task is important and can influence behaviors towards learning” (Rijken & Fraser, 2023, p.4). High levels of self-efficacy can contribute to greater motivation and impact an increase in engagement towards a given task.

STEM: is an abbreviation that is used in the field of education for four closely connected areas of study: science, technology, engineering, and mathematics. Furthermore, “integrated STEM education is an effort to combine science, technology, engineering, and mathematics into one class that is based on connections between the subjects and real-world problems” (Movahdazarhouli et al., 2023, p.107).

Meta-analysis: is a set of quantitative techniques that are used for analyzing the results of two or more studies on the same subject. The goal of meta-analysis is to understand and analyze the results of one study in the context of all studies on the subject (Creswell & Guetterman, 2019).

Summary

As with any other field of study, the field of education is in constant need of research that drives progress and equips educators with the best teaching methods to better serve their students. With the mission to understand how people learn best and support all types of learners, modern educators, researchers, and theorists have turned to the idea that students learn best through collaborative, hands-on tasks which was an educational theory, originating from Constructivism, proposed by many early scholars and theorists such as Brunner, Dewey, Socrates, and Piaget. Educators in the 21st century have noticed an alarming decrease in student performance and motivation in STEM courses. Educators have refined the hands-on approach to learning—referred to as “PBL”—to help students succeed in STEM courses. This approach aims to best meet the needs of 21st century learners and equip them with the necessary set of skills to solve real-world problems and possess the necessary set of skills. The primary focus of this project will be to determine the impact that a PBL approach has on students in STEM courses, with emphasis on student efficacy. Chapter 2 is a literature review exploring the impacts of project-based learning on student efficacy in STEM courses. Areas of focus are the impacts of PBL on student motivation, implementation of PBL in Universal Design for Learning (UDL), as well as PBL’s relevance to the real world, and ability to foster meaningful collaboration.

Chapter 2: Review of Related Literature

Introduction

In many ways, a nation’s economic and business prospects depend

on its skilled labor force, which is why STEM education is receiving more attention in elementary, secondary, and even tertiary education. The COVID-19 pandemic made students’ struggles with STEM even more apparent. Not only were they not receiving enough support in STEM classes, but they also encountered technical difficulties that caused stress and discouragement. As a result, a series of studies in developed Western countries have shown a noticeable decline in student motivation in STEM courses. Based on the data on student motivation, the decline is in STEM courses, achievement, and student interest in STEM-related career choices is concerning (Li et al., 2023). PBL is a student-centered pedagogical approach that emphasizes challenging students by introducing exploration of real-world problems to challenge student’s deeper learning (Eckardt et al., 2020). By becoming better accustomed to effective learning strategies that can help successfully develop and sustain student attention, educators are then able to make prompt changes to their teaching pedagogies. The primary goal of this chapter is to explore the impacts that PBL has on student efficacy in STEM courses.

To begin with, motivation is the first key factor that demonstrates how PBL impacts student engagement and efficacy in STEM courses. Motivation is established by the transformation of students from passive to active learners (Li et al., 2023). Understanding and being able to differentiate between the different types of motivations can help guide educators toward a well-developed and engaging teaching style (Li et al., 2023). The use of technology is also used as a means of motivating students by providing them with a variety of active and engaging ways to engage in the lesson. Motivation can also be increased by maintaining the relevancy of the content to real-world interests and ideas of students and bringing meaningful connections to prior knowledge building twenty-first-century skills. Furthermore, the impact of project learning extends not only to student collaboration but also to staff sharing expertise and experiences. Lastly, PBL’s impact on student efficacy in STEM courses is evident through the use of the Universal Design for Learning model (UDL), which sparks student creativity, allows for the practical application of knowledge, and accommodates the learning needs of all students (Bastoni et al., 2023; Cavanagh et al., 2020; Crowther et al., 2023). Lastly, educators can use this information to determine whether PBL is a good fit for their classroom determine whether it can assist them in making the necessary adjustments to their lesson plans to help increase student efficacy in STEM courses and notice the impact that PBL can have on their student’s motivation, academic performance, and engagement.

PBL Can Assist in the Increase of Student Motivation

Motivation is a multidimensional construct that consists of various forms of both intrinsic motivation and extrinsic motivation. Intrinsic motivation refers to the inner desire to engage in an activity because it is inherently pleasurable and desirable (Li et al., 2023). Literature reports that this is the

most powerful type of motivation as intrinsically motivated students have their interests and enjoyment fulfilled while experiencing a great level of autonomy, a feeling that their perspectives have been taken into account and validated as important (Leggett & Harrington, 2019; Samsudin et al., 2020). Similarly, Identified regulation is when one chooses to do an activity because he or she finds it important and useful (Li et al., 2023). On the contrary, External regulation is a type of motivation that aims to achieve rewards, or the opposite, avoid negative consequences relating to the activity and is known to have the lowest level of autonomy or self-determination. It is important to know and distinguish the different types of motivation to understand the impact that each has on student academic outcomes and levels of engagement. Researchers propose PBL as a possible solution to increasing student motivation and engagement through its emphasis on autonomy (Leggett & Harrington, 2019). In their research, Leggett & Harrington (2019) refer to Wurginger et al.'s (2007) qualitative study which showed that students who are engaged in STEM activities using the PBL model are more engaged than their peers in traditional classrooms. Wurginger's study conducted in 2007 and supported by modern studies suggests that when PBL is utilized correctly, it is one of the most effective strategies for motivating students and maximizing learning (Demir & Önal, 2021; Leggett & Harrington, 2019; Rafiq et al., 2023). Kim and Kim (2021) differentiate between simple participation in the activity and a deeper level of interaction fueled by motivation to learn. Factors such as interaction level, specific characteristics of participants, and learning motivation all proved to have an influence on one another in the PBL environment. Perception of PBL by students and teachers also has a great impact on student motivation and engagement.

Teacher and Student Perception of PBL Helps Increase Motivation and Efficacy

The way that both teachers and students think about PBL plays a significant role in the learning process and outcomes. In an extensive research study conducted in China, researchers examined elementary teacher's attitudes toward PBL (Cai et al., 2023). The study was based on a questionnaire of 257 teachers and 10 interviews where participants were asked to provide answers to a series of questions involving the three dimensions: "cognitive beliefs of PBL, effective states of PBL, and perceived control cognitive of PBL" (Cai et al., 2023). As part of their response, educators characterized their feelings towards different parts of PBL and rated the concept on a scale of one to five with one being "strongly disagree" and five being "strongly agree" (Cai et al., 2023). The study discovered that teacher's perception of PBL did not depend on the educator's gender but the most heavily contributing factors were the teacher's years of experience, their professional training, and subject competency in STEM courses, as well as how well-prepared educators were to teach using the PBL approach (Cai et al., 2023). An experiment consisting of 77

student participants in secondary education in Malaysia and South Korea was conducted to measure student attitudes toward PBL in a physics class (Uden et al., 2023). This study applied a two-group pre-survey-post-survey method which was conducted in the quasi-experimental research design where the participants were divided between the experimental group which used the PBL approach and the control group which used a traditional approach, to collect the quantitative data. To determine the changes in students' perception of physics, the Colorado Learning Attitudes Science Survey (CLASS) conducted a survey before and post the experiment for both the controlled group that used PBL, and the traditional group (Uden et al., 2023). Many students reported being discouraged with physics in their pre-experiment survey. In the post-experiment survey consisting of 41 items to be completed in ten minutes, results were in favor of using the PBL model to learn physics since students in the control group reported increased beliefs in their ability to do physics. Even more, students' motivation managed to maintain itself at 95%, unlike the participants in the traditional group who reported unchanged perception of physics and motivational decline in the post-experiment survey (Uden et al., 2023). In the experiment performed by researchers Rijken and Fraser (2023), students reported a surprised fascination regarding the project-based strategy and the overall shift from the highly regulated learning environment. To sum up, the experiment with the implementation of PBL in a STEM course, specifically physics, has demonstrated that one of the impacts of PBL is an increase in motivation which contributes to students' positive attitude toward the activity itself, and PBL as a pedagogical method.

PBL's Ability to Foster Active Learning

Project-based learning is an important component of STEM education as students have the opportunity to practice important skills such as problem-solving and communication while interacting with the content. Active learning is fostered through hands-on experiences that PBL provides where students perform experiments, and try new methods to come up with the one that works best which helps them increase their efficacy and science literacy skills (Dwi Anjli et al., 2023; Pasaribu & Dia, 2022). Since science literacy is developed through inquiry, experimentation, and building on prior knowledge, which are components of PBL, this model of teaching efficaciously improves students' application of knowledge (Suryanti et al., 2024). Fraser (2023) is a researcher who stressed the importance of meaningfully engaging senior high school students in mathematics courses due to the noticeable fall in mathematics enrollment in senior years of high school. Research shows that student's attitude toward mathematics is developed based on their prior achievement and experiences. Furthermore, studies have shown that project-based mathematics provides students with opportunities to be active participants in their learning which also helps to make meaningful connections with the content and the problem that can result in self-regulating motivation processes and

increase the students' learning outcome (Chen & Kalyuga, 2020; Rijken & Fraser, 2023). PBL's ability to foster active learning lies in its origin.

PBL finds its foundation in the works of well respected Constructivist scholars such as Bruner, Piaget, and Vygotsky who focused their studies on discovering how learners acquire knowledge best and what factors play a key role in the learning process. Based on the Constructivist theory that is known to be the most developed by scholar Jerome Bruner, a student plays the role of a constructor of information and takes an active role in his learning (Erbil, 2020; Qureshi et al., 2023). Researchers Chan and Ko (2019) found that students' high levels of engagement are a reliable indicator of student performance and achievements. Since PBL is a product of the constructivist theory, its goal is to provide students with the necessary experience of actively acquiring knowledge. PBL is a research-based instructional strategy that can be effective for increasing learners' motivation and retention of information as they actively engage in higher-order thinking processes and work towards achieving an assigned task (Rijken & Fraser, 2023; Qureshi et al., 2023). Trying to investigate a possible connection in PBL assisting in the increase of engagement and student achievement Rijken and Fraser (2023) have conducted an experiment consisting of 284 students. However, this time the two researchers decided to go a step further and determine whether a hands-on project-based learning approach can have a different impact on male and female students. The significance of this study lies in the discovery that implementation of PBL in the classroom can have different effects on female and male students. Specifically, PBL has shown to be effective in engaging both male and female students however, female students have shown higher achievement when being in the traditional learning environment, whereas male students did better with the implementation of PBL (Rijken & Fraser, 2023). Furthermore, the study has shown that although academic efficacy increased, but not significantly, with the application of PBL when compared to traditional methods, the achievement decreased for students of both genders. Overall it can be concluded that female students benefited from the traditional method, whereas male students benefited from the project approach.

Technology as a Means of Increasing Student Motivation

Technology has an important place in the digital world of the 21st century and has significantly reshaped education in recent years. As a result, technology literacy is something that students are expected to acquire during their years in school (Bi et al., 2024). With classrooms being equipped with new technologies such as smart boards, computers, and tablets, teachers are expected to utilize them in the curriculum lesson plans. Since technology is considered a high-cost method of teaching, researchers have decided to experiment on its effectiveness. Studies looking for a possible relationship between PBL and technology have shown that when a technology-rich environment

was applied to project-based learning tasks, students were motivated and more open to collaboration and reflection on the learning process (Demir & Önal, 2021; Rijken & Fraser, 2023). In a study by Aldamir and Tatar (2014) in Turkey, 212 articles on technology-assisted mathematics education were studied to determine whether the use of technology in the classroom has an impact on students' attitudes toward mathematics. The results of the study have concluded that when technology is incorporated into PBL, there is an increase in student motivation and level of engagement with the task (Demir & Önal, 2021; Bi et al., 2024). Furthermore, Muzana et al. (2021) examined the relationship between the use of technology in STEM courses, particularly science, and referred to it as E-learning Science, Technology, Engineering, and Mathematics (ESTEM). From the results of the study, it can be concluded that the e-learning STEM project-based learning model is an effective modality to be used in teaching. Further studies suggest that when integrated effectively into the classroom, technology can help increase student efficacy in learning (Carstens et al., 2021). During an examination of teachers' attitudes about technology in the classroom, many educators differentiated between technological aid tools such as smart boards and high-tech classrooms, in which students spend the majority of their time on their personal computers without the teacher keeping them accountable for learning. Overall, teachers provided positive feedback about technology tools being integrated into the classroom where the teacher facilitates the learning and technology serves as a learning aid that helps motivate students and encourages their engagement.

Additionally, technology has influenced student efficacy by transforming teaching and learning. Implementation of technology in PBL classrooms has enabled teachers to use a variety of creative digital platforms for facilitating collaborative projects, having students engaged in interactive and flexible delivery of instruction, as well as assessment and real-time feedback (Bi et al., 2024). Artificial Intelligence-driven technology has also enabled educators to work with educational platforms to assess students, track their progress, and better understand their areas of strength and areas of need to then establish interventional assessment that would meet students at their level. This increases student involvement in the project since the student is acquiring the prerequisite information to grasp the assignment, which he would otherwise lack due to a knowledge gap, resulting in a lack of engagement and self-efficacy (Bi et al., 2024). One example of involving technology in the classroom is having students use it during their math centers to enhance learning and support their creativity by offering access to quality visuals and interactive personalized learning (Carstens et al., 2021). Uniquely, technology facilitates cultural and global exchange of experiences and ideas where students and educators can get inspired and learn from each other (Bi et al., 2024). Educational technology's gamified features create an engaging learning environment empowering students to persist in their learning by overcoming learning obstacles. To sum

up, through the use of engaging digital platforms and resources, technology fosters an enjoyable learning experience for students which has a significant impact on their academic motivation (Bi et al., 2024). Although technology is an effective tool for getting student attention, it needs to be professionally integrated into the content standards curriculum and activities to avoid it becoming a distraction. The literature review acknowledges a need for further exploration and study of how technology can support diverse students with varying levels of self-efficacy and learning needs.

Project-Based Learning Through the Lens of UDL

The Universal Design for Learning is an evidence-based framework developed by Center for Applied Special Technology (CAST), a national non-profit research organization with the main goal of making education accessible to all students. The UDL model's principles to teach project-based learning (PBL) encourage engagement as well as learning from students by promoting active engagement and developing cooperation. It also creates a dynamic learning environment that boosts student efficacy. UDL allows for differentiated instruction to make learning accessible and engage all students by providing multiple means of representation, accommodating different learning styles, and making content accessible (Bastoni et al., 2023; e.g., Cavanagh et al., 2020; Crowther et al., 2023). UDL's principles go side by side with many of the principles that PBL supports with a common goal of improving students' retention of content knowledge leading to deeper understanding by encouraging personalized learning environments (Manly, 2024). When UDL is combined with PBL, it allows educators to scaffold important skills that both learning frameworks agree on as being essential for students to be successful in the 21st-century such as critical thinking, communication, collaboration, and problem-solving. In their research and extensive literature review focusing on the implementation of PBL in UDL education, researchers Sormunen, et al. (2019) suggested that PBL is an effective approach to learning due to its adaptability to the needs of different learning styles and the teacher's ability to differentiate instruction to meet the individual needs of the students.

Multiple Means of Representation

One aspect of Universal Design for Learning (UDL) that closely aligns with PBL consists of offering multiple means of representing knowledge. As a result, this enables students to demonstrate their learning using a model that best fits their learning style but is equally challenging. Such an approach accounts for students' individual needs, strengths, and interests, increasing student motivation and active involvement in the task (Crowther et al., 2023; Manly, 2024). Considering that PBL-based STEM can be challenging for many students, teachers can use a variety of instructional strategies to help students understand complicated concepts in STEM and increase their

self-efficacy. As a result, auditory, visual, and kinesthetic learners are given the freedom to demonstrate their knowledge using many models and various forms of expression. This flexibility enables students to demonstrate their skill sets while engaging with the curriculum. Since colleges expect students to possess a certain skill level and demonstrate competency across the curriculum, implementation of a STEM-based UDL instructional approach provides students with alternative ways of accessing content and building competency without increasing unnecessary cognitive load (Kohler & Balduzzi, 2021). In their research, Crowther et al., (2023) worked with a group of adult students who studied STEM content by listening and writing songs. Learners in this study engaged with the text of the song to extract important information that was needed for their science lesson and come up with their original product to demonstrate knowledge. Although this specific PBL approach arguably has some limitations, it provided some students with an alternative auditory model that aided the retention of information through rhyme and repetition of key content vocabulary.

Teacher Training and Professional Development

Professional training is what develops professionalism in teachers and makes them more equipped to assist all learners effectively. Teachers get an opportunity to understand the foundational principles of the teaching methods to then be able to apply them in their classroom. Educators must receive appropriate training in UDL and PBL foundations and strategies to accommodate diverse learning styles, as well as work on mastering the delivery of these educational methods in addition to content knowledge (Lo, 2021; Tsai et al., 2021). PBL helps students develop critical thinking, problem-solving, and collaboration skills essential for success in higher education and the workforce. Meanwhile, UDL ensures that all students have the opportunity to develop these skills regardless of their learning differences. PBL training helps teachers design hands-on projects that engage students at various skill levels while working to meet the mastery of the content standards. In the literature review, many educators voiced their concern about feeling under-prepared to implement PBL in a UDL classroom due to a lack of professional training (Rijken & Fraser, 2023; Tsai et al., 2021). Since professional development supports teachers, educators need to receive professional training in PBL to be able to implement it in a traditional classroom or a UDL classroom. Professional development introduces teachers to innovative teaching practices and expands their professional toolkit. For PBL to be as effective as researchers and policy-makers intend it to be, teachers need to be well-trained and practice teaching it in the classroom for many years (Markula & Aksela, 2022). Furthermore, Rijken and Fraser's (2023) mixed-method study revealed that although students and teachers enjoyed the new environment that PBL establishes, both educators and students experienced challenges that are less evident with the traditional teaching model. For example, after interviewing the three teachers

right after the PBL lesson, teachers reported they needed to prepare a lot more and felt the pressure from the school administration and parents to teach by implementing the PBL while making sure that the content standards were met. In another study where teachers implemented the PBL model to teach STEM, educators stated that although they may have ideas of how to teach STEM using PBL, they have difficulties with a lack of resources and time needed to prepare for facilitating a quality project while still being able to cover the standards (Lo, 2021; Morrison et al., 2020). Similarly, significant instructor effort may be needed to properly evaluate students' creative work considering that UDL supports multiple means of expression (Crowther et al., 2023). If the primary goal is understanding content rather than artistic expression, the rubrics should transparently reflect these priorities to assist teachers with a fair assessment process of student work.

Similarly, Taiwan's Ministry of Education has also looked into the problem of underprepared primary teachers working with curriculum and classroom settings that they have not been trained in. To address this concern, the Ministry of Education obligates educators in Taiwan to take special courses in technology on top of the regular pedagogical curriculum, especially due to the changes that were made to the K-12 education with a mandate to add a living technology subject to the curriculum to promote student technological literacy (Tsai et al., 2021). As with Rijken and Fraser's (2023) mixed-method study, these educational changes pressure educators who have not been technology-trained leaving them feeling overwhelmed. In attempts to lower this pressure, researchers have advocated for STEM-based project activities combining the use of technology to help teachers acquire technology literacy skills and demonstrate how to effectively combine the two (Tsai et al., 2021). In addition to Taiwan, researchers in the United Kingdom also see great value in teaching STEM through project-based learning and technology (Tsai et al., 2021). To further support the claim about the importance of teacher training, Tsai et al. (2021) have referenced Honey et al.'s (2014) study which proposed that many cases of unsuccessful delivery of STEM education had to do with insufficient teacher readiness as a possible cause and adopted STEM-based training activities to enable the preservice teachers to gain experience to participate in STEM activities.

Another study has also focused on the importance of teachers' preparedness to offer students the needed help, especially in secondary STEM courses where student motivation and engagement are much lower than in primary education since gaps in knowledge make it much more difficult for students to successfully follow through with the task. In a literature review on the importance of teacher preparedness to teach STEM, Morrison et al. (2020) referenced the decision made by the Commonwealth of Australia (2015), the European Parliament (2015), as well as U.S Department of Education (2016), to focus on STEM literacy in K-12 education. As a result,

more schools are choosing a focus on STEM with a common theme among these schools being PBL (Morrison et al., 2020). Once again, researchers claim that part of the solution is to focus on teacher preparation programs and preparing teachers in service to work in educational environments incorporating student-centered PBL study of STEM, as many instructors have not experienced this form of learning themselves (Morrison et al., 2020). To sum up, UDL and PBL training for teachers is crucial to developing inclusive, dynamic, and productive learning environments that meet the unique needs of every student and equip them to take on new challenges in the future. This will enable them to boldly pursue the opportunities that STEM education brings.

Supporting Equity in Education by Accommodating the Learning Needs of All Students

The purpose of the Universal Design for Learning (UDL) model is first and foremost to provide equity in education by creating inclusive and accessible learning environments and maximizing learning opportunities for all students. UDL aims to remove barriers to learning and establish equity by providing learners with multiple means of representation, engagement, and expression in varied instructional methods. Based on a study of the literature, PBL projects have shown to be effective in inclusive classrooms because they can be customized to the needs of a variety of learners and offer a framework that allows teachers to differentiate the learning process (Sormunen et al., 2019). Consistent to reduce inequality and expand educational opportunities for all students, PBL may revolutionize science education by engaging all learners in meaningful and rigorous knowledge-building activities (Miller & Krajcik, 2019). Since student abilities have a significant impact on group dynamics and individual student effectiveness, group composition is particularly crucial in UDL STEM classrooms that adopt the PBL framework. When a low-achieving student with needs and low self-esteem is paired with all high-achieving students for a group project, the high achievers can hinder the less confident students' learning opportunities, which could lead to low participation from the student with low social status in the group (Sormunen et al., 2019). An effective inclusive PBL classroom requires all students to participate through differentiated learning, which allows each student to choose the method of representation and evaluation he will use to demonstrate his knowledge without removing rigor.

In a quasi-experiment study, Manly (2024) conducted an experiment sampling 1278 undergraduate women enrolled in 283 sections of online classes in multiple subject areas throughout the 2018-2019 academic year. Performance data was gathered to determine the impact of utilizing multiple modalities to present course information on course success. To avoid some

of the obvious study limitations, students were assessed for prior knowledge each week before beginning the assignment and choosing their preferred modality. As proposed by UDL, multiple modalities were offered to students consisting of auditory, visual, as well as many options of interactive media. The results have demonstrated that compared to students utilizing only one modality, the usage of multiple modalities predicted an average 0.05 knowledge score gain on a 0–1 scale during a learning task. This resulted in a significant improvement for the student—nearly 10 percentiles above the activity median (Manly, 2024). Following the completion of the study and taking into account the vast number of participants, the researcher agreed with UDL’s claim that permitting many modes of representation can be beneficial to learning (Manly, 2024). In another study, it has been suggested that PBL promotes equity by increasing student engagement (Miller et al., 2021). Researchers have discovered that PBL has benefited students in low socioeconomic communities, cross-culturally supported academic achievement, and reduced the achievement gap between students from low and higher socioeconomic backgrounds, all of which provide support to the idea that PBL can be effective in promoting equity among learners (Leggett & Harrington, 2019). The study has then expanded its focus on gender equity noting that female students were more prompt to having lower self-efficacy in mathematics courses than male students. According to the research, boys benefited more from the engineering and technology activities in terms of the learning environment and level of cooperation, while girls benefited more in terms of understanding project-based mathematics (Leggett & Harrington, 2019). UDL’s focus in STEM education is designing accessible and inclusive learning experiences as well as providing multiple ways to not only deliver instruction but also assess it. In summary, PBL has many beneficial effects on students’ learning in UDL STEM classes, but there are certain obstacles and barriers to its implementation. These include the lack of resources and project-friendly curriculum design, as well as the requirement for professional training for staff members to carry out the practice.

PBL’s Relevance to Real-World Experiences and Collaboration

Project-based learning seems to have found its place in an ever-evolving world where twenty-first-century skills such as collaboration and creativity have become essential parts of STEM education. It is more important than ever for students to be able to connect the knowledge and skills offered by the curriculum to the skills required to solve problems in the real world. The expectations that are set for educators to prepare students for high-stakes tests often leave them with little time to equip students with the necessary skills needed in the twenty-first century. Project-Based Learning (PBL) is frequently used to help teachers build and maintain a balance in STEM courses between standards-based curriculum and real-world skills and experiences.

PBL in STEM Assists with the Development of Twenty-First-Century Skills and Promotes Real-World Experiences

Many countries accept STEM education because it provides opportunities to equip students with the knowledge and skills needed in the 21st century and provides readiness to face the challenges of a highly technological world. Literature reports on the important impact that PBL has on student learning, making it relevant and meaningful to each student by allowing learners to reflect on real-world problems that require solutions (Leggett & Harrington, 2019). The effectiveness of such an approach is also supported by the idea that when educators use real-world situations to teach problem-solving and critical thinking skills, it is easier to maintain students’ engagement which results in a better understanding of the concept from lecture content (Darhim et al., 2020; Saputra et al., 2019). PBL seamlessly embodies the implementation of essential twenty-first-century skills such as inquisitiveness, self-assurance, and logical reasoning which can all be found in the attributes of STEM education (Irdalisa et al., 2024). Creativity has become another focus in the twenty-first century since it is highly needed for the advantages occurring in science and technology. Creativity helps students see problems from various angles and trains an open mindset when solving issues (Irdalisa et al., 2024). Application of statistical knowledge is another example where students get to use real-life data and STEM skills to further develop their knowledge and practice higher-order thinking skills (Kim & Kim, 2021). A mixed methods approach study was conducted to determine whether PBL, being proposed as an effective method of teaching STEM, improves students’ 21st-century skills. The study was composed of 35 participants in the experimental group who were treated with PBL, and 35 student participants in the control group who were treated with a traditional method. “ANCOVA test for “critical thinking skills” showed a significant difference between the experimental and control group ($F = 104.833, p = 0.000 < 0.05$). For collaborative skills, results also showed a significant difference between the two groups ($F = 32.335, p = 0.000 < 0.05$). For problem-solving skills, the mean value of experimental (25.54) and control group (16.94) showed a high difference after the intervention” (Rehman et al., 2023, p.1). Observation of the classroom served as an extension to the experiment which also showed a boost in student problem-solving and collaboration accompanied with active participation. PBL’s objective of STEM in education goes along with the principle of the twenty-first-century which enables student acquisition of science and technology literacy to then be able to be applied in daily life (Muzana et al., 2021). Overall, it can be concluded that the introduction of real-world problems to students in PBL STEM courses allows them to develop many important twenty-first-century skills that will ensure competitiveness in the current global economy.

PBL Encourages Collaboration

Collaboration is a fundamental component of twenty-first-century skills that involves students in the exchange of ideas and points of view to solve issues or achieve a common goal. Rather than relying solely on fact memorization, collaboration encourages students to construct their knowledge collectively. The effectiveness of collaboration in hands-on learning finds its support in Bruner's Constructivist Theory where the author states that collaborative experience facilitates the exchange of ideas and perspectives, allowing students to explore complex tasks and enhance their understanding of the content. Studies consisting of classroom observations revealed a favorable effect of implementing PBL in STEM activities as it boosted the level of collaboration and problem-solving skills among students (Markula & Aksela, 2022). Students' collaboration skills were improved by focusing on their communication abilities such as promoting one another's viewpoints, taking turns speaking, listening to one another, and participating in thoughtful discussions. Students' successful collaboration and active participation throughout the PBL project were noted, and these factors significantly affected its outcome (Rehman et al., 2023). In response to the COVID-19 era, collaboration and social communication methods have changed, developing into a mixed learning environment. As a result, the Ministry of Education (2020) announced 10 policy proposals for the transition emphasizing the importance of fostering learners with interactive skills to construct new knowledge (Kim & Kim, 2021). Ultimately, including PBL in STEM courses provides students with several significant opportunities for collaboration, allowing them to discuss ideas and engage in inquiry-driven learning.

Academic Achievement and PBL

Several studies have investigated the impact of PBL on academic achievement in STEM courses. In a meta-analysis study conducted by Zhang & Ma (2023), 66 experiments performed over 20 years have been studied to run an in-depth quantitative analysis. Results have shown that compared with the traditional teaching model, the project-based learning model has significantly improved student outcomes and positively contributed to academic achievement (Zhang & Ma, 2023). Another study using a quasi-experimental design model was conducted to explore PBL's impact on academic achievement and has demonstrated PBL's effectiveness in terms of academic achievement and knowledge acquisition. According to the findings, students who took part in the Flipped Classroom Model (FCM) and PBL group scored much higher on post-tests than students in the control group, demonstrating improved academic performance. On the other hand, there was little difference between the groups' levels of individual innovation competency. Additionally, it was noted that the PBL group's retention scores were

considerably higher than those of the control group (Guliz Aydın & Mutlu, 2023). Research comparing the effects of a project-based learning strategy and a technology-assisted approach on academic accomplishment also found that the project-based learning approach had a greater impact on academic achievement than the technology-assisted approach (Demir & Önal, 2021). On the contrary, a meta-analysis conducted by Zhang & Ma (2023) suggests that although PBL can help increase student learning outcomes, there are not enough studies to conclude that it increases student academic achievement.

Summary

Many researchers have looked into the studies of Project-Based Learning (PBL) to explore its impacts on student efficacy in STEM courses, especially because STEM education has received increased attention due to its crucial role in the demands of the digitalized world. One significant finding is PBL's positive impact on student motivation. By engaging students in hands-on activities that connect to real-world issues, PBL encourages intrinsic motivation resulting in students' engagement and commitment to learning. Furthermore, when viewed through the lens of Universal Design for Learning (UDL), PBL proves to be inclusive and effective in meeting the needs of diverse learners. UDL's principles consist of providing students with multiple means of representation, engagement, and expression, as well as accommodations to learning that enable students to participate in varied project formats. Moreover, PBL's emphasis on real-world experiences and collaboration enhances its educational relevance. Through engagement in real-world example tasks, students develop critical thinking and problem-solving skills, mirroring the professional environments. PBL not only enhances motivation but also aligns with UDL principles.

Chapter 3: Implications

Introduction

A world that has technology that goes as far as creating and using artificial intelligence is inevitably transforming its education system to meet the needs of modern society. The focus of the education system shifted from placing emphasis on memorization of information and instead prioritizing students to possess essential skills such as problem-solving, critical thinking, and collaboration to have then an opportunity to practice their implementation by interacting with real-world examples (Kim & Kim, 2021; Leggett & Harrington, 2019; Saputra et al., 2019). STEM has proven itself to be the driving force of economic growth and a catalyst for discoveries, inventions, and opportunities. It has always been an important aspect of student education, but there has been a decline in student motivation and engagement in Western countries over the last 20 years, in particular in the post-pandemic years,

according to educators. (Li et al., 2023). Since knowledge acquisition largely depends on student motivation and engagement, it is important to understand how students learn most effectively. Finding its foundation and support in learning theories of famous theorists such as Dewey, Piaget, and especially Bruner's Constructivist theory, PBL emerged as a hands-on model that supports student's active learning by providing students with an opportunity to demonstrate their knowledge through the construction of a project (Eckardt et al., 2020; Rafiq et al., 2023; Shah, 2019). The purpose of this project was to provide a literature review composed of studies focusing on the impacts that implementation of PBL learning in STEM may have on student efficacy.

Research suggests that some of the most evident impacts of PBL in STEM education on student efficacy are: an increase in student motivation and engagement, (Demir & Önal; 2021; Leggett & Harrington, 2019; Rafiq et al., 2023) the establishment of PBL's relevance to real-world experiences and development of essential skills (Darhim et al., 2020; Irdalisa et al., 2024; Saputra et al., 2019), and implementation of PBL through the lens of UDL (Bastoni et al., 2023; e.g., Cavanagh et al., 2020; Crowther et al., 2023). Having identified some of the impacts of PBL, the project provides a bridge of both practice and policy implications that can help better understand the dynamics of this problem and help educators become better equipped for teaching STEM. At last, the project discusses several areas where further research is needed and emphasizes the need for well-rounded research, including the necessity to expand the study of PBL's impact on student efficacy in STEM courses to improve the effectiveness of STEM education.

Conclusions

Research shows that there has been a decline in student motivation towards STEM education in developed Western countries in the past 20 years, which became even more prominent in the post-pandemic years. Since student efficacy can often be linked to student success, educators need to be invested in finding ways that increase student learning motivation and help them achieve essential learning standards and skills (Li et al., 2023; Rehman et al., 2023). The project aimed to review the literature and explore the impacts that motivation and engagement may have on student efficacy in STEM courses when PBL is being implemented. Research supports the idea that motivation and engagement may increase student efficacy in STEM courses through the implementation of PBL (Demir & Önal, 2021; Leggett & Harrington, 2019; Rafiq et al., 2023). Tracing the origins of PBL provides the understanding that it was inspired by the theory of Constructivism that sees value in student active learning and suggests that students acquire knowledge best when they are actively constructing it (Shah, 2019). Although research suggests that implementation of PBL in STEM education can increase

student efficacy and therefore make learning more effective, it was also found that lack of teacher subject matter competency in STEM as well as low level of preparedness to teach PBL may be a stumbling block for increasing student efficacy in STEM education through implementation of PBL (Cai et al., 2023). It can be concluded that although PBL can be a great approach to increasing student efficacy in STEM education, its success is conditional as it also depends on the teacher's overall competency to teach STEM and professional preparedness to implement PBL.

Furthermore, research indicates that implementing PBL in STEM can be a good fit for 21st-century education because it fosters the essential skills required for students to be successful in the future: collaboration, critical thinking, and problem-solving, all of which are embedded in PBL's commitment to making learning relevant to students' real-life experiences. This is further supported by a claim that PBL implementation in STEM goes along with enabling students to acquire science and technology skills needed to be successful in the 21st - century and then be able to be applied in daily life (Muzana et al., 2021). Since PBL in STEM promotes student acquisition of essential skills such as problem-solving and collaboration (Rehman et al., 2023), it presents itself as an effective way to increase student presence in the classroom and as a result increases student overall academic efficacy. This is an important finding because it confirms the idea that PBL can be effectively implemented in the modern classroom to not only increase student efficacy in STEM but also prepare students to be well-rounded individuals with skills who are ready to put their knowledge to use.

A literature analysis also showed that PBL's principles overlap with those of UDL, with the shared goal of providing students with opportunities for deep learning in which individual learning models and environments are encouraged. By creating a dynamic, active learning environment, UDL's framework works well with teaching PBL STEM education since it promotes active engagement and boosts student efficacy. Furthermore, by providing differentiated instruction, and options for multiple means of assessment without removing the rigor, the PBL method of teaching STEM in the UDL framework makes sure that content is easily accessible to all students accommodating their individual needs as well as assets (Bastoni et al., 2023, e.g.; Cavanagh et al., 2020; Crowther et al., 2023). When UDL is combined with PBL it enables educators to scaffold essential skills that students need to have in twenty-first-century education. This finding is significant as it demonstrates that when STEM is taught using PBL through a UDL framework, it not only maximizes student efficacy but also makes sure students with all ability levels and needs are meaningfully engaged. While PBL has gained recognition as an instructional method that works well for accounting students with various learning styles, it has shown some controversy regarding equality, particularly regarding student's socioeconomic status and gender. A quasi-experiment study addressed by Manly (2024), suggests that PBL has been shown to increase student engag-

ement in low socioeconomic communities and has even positively contributed to student academic achievement however access to the needed materials and funding can often be a barrier. When it comes to the question of gender, implementing PBL in STEM courses has shown to be more beneficial to male students and not so much for female students who are more likely to have lower mathematics self-efficacy (Leggett & Harrington, 2019). This is a crucial PBL element for educators to take into account since it shows how students of different genders can benefit from instruction in different ways. Overall, understanding the different impacts that PBL may have on student efficacy, can help educators make learning more engaging, meaningful, and inclusive. It can be concluded that although research supports PBL's ability to increase student efficacy in STEM courses through motivation, engagement, relevance, and inclusiveness when it comes to the components of equity such as socioeconomic status and gender, there are some controversies for educators to take note of and at the same time areas of growth.

Practice Implications

PBL should be used in a STEM classroom as an effective and inclusive assessment method that complements direct instruction. One advantage of such practice is that it helps students to apply theoretical knowledge gained through direct instruction to real-world issues, which reinforces students' understanding by allowing them to recognize the relevance of what they are learning which increases student's interest and engagement in their learning. Another important aspect of practicing PBL is that it fosters critical thinking, analytical, as well as problem-solving skills that are crucial for STEM fields. Students completing a PBL-based STEM assessment will need to be able to analyze information, formulate hypotheses, and come up with solutions independently. In the case of a group project, each student will be responsible for contributing equally by demonstrating their creativity and ability to collaborate effectively, which is another important skill that PBL promotes to stay true to its commitment to making students successful twenty-first-century learners. One of the biggest advantages of PBL consists of being able to assess students' higher-order thinking skills, unlike the traditional assessment that often focuses on memorization skills and procedural knowledge, which often only benefits students in the short term as they are not allowed to engage with their knowledge on a deeper level and apply it to real-world situations. In the classroom, students' higher-order thinking can be assessed through both informal and formal assessment. The informal assessment can consist of the teacher asking students questions about their next steps and asking them to justify their answers and reasoning. The formal assessment can consist of evaluating a finished product completed by a student and then having the student fill out a detailed reflection sheet.

Students should be introduced to PBL early in their educational years so that when the problem demands them to employ more advanced problem-solving procedures, they have already mastered the principles and can focus on the task itself. For example, starting in Kingergarten, teachers should come up with basic activities to facilitate PBL and problem solving skills and with years add on rigor and depth of critical thinking. To annually review expectation, teachers can give a presentation at the start of each school year that would introduce and remind students of the foundations and goals of PBL, as well as practical examples of how it will work in the classroom. To make this a more meaningful experience, educators should introduce the tools and equipment that will be utilized during these projects, as well as go over the expectations that students must satisfy to demonstrate that they have met the requirements. As tools are being presented, the teacher should pass them around to students and perform a quick demonstration on how to use a specific tool. Sample PBL work can also be provided, which is known to be beneficial for English learners and visual learners and this way will create a more inclusive learning experience.

When implementing PBL in a STEM classroom, concrete expectations must be in place for both educators and students to keep each accountable for the effectiveness of PBL-based instruction. This can consist of rubrics, administrative observations with feedback provided, and forms of assessment that will be able to accurately assess teacher preparedness and student's retention of standards-based knowledge. Teachers should go over the criteria on the rubric with their students. Overall, monitoring the implementation of PBL by the school administration would make it easier to identify areas where teachers could benefit from more support and the need for focused professional development and ensuring alignment with educational objectives. Regular monitoring also assists in adjusting instructional strategies and resources to improve student learning outcomes.

Policy Implications

There should be a policy passed enabling schools with PBL education in STEM courses to receive more funding in order to ensure that all students have equitable access to meaningful learning and to keep up with technological advancements. This investment will not only improve educational quality but will also boost the US's competitiveness in technology and STEM fields. Education is the key to a country's future, so prioritizing financing in this area is critical for equipping children to flourish in a quickly changing technological environment. Furthermore, increasing financing for PBL STEM education would help to get children excited about this profession and, eventually, contribute to economic growth, as STEM majors are in high demand. This can help address a practical gap in the workforce that firms frequently encounter when graduates enter the workforce with only

theoretical knowledge and little experience and exposure to practical knowledge and matters of implementation. The effectiveness of adopting this policy can be reviewed through reports and evaluations to ensure that the funds received by school districts, individual schools, and even educators are used efficiently. The money should come in the form of a grant with clear guidelines put in place regarding what is permitted to be purchased and what is necessary to keep qualifying for this financing. All schools that choose to adopt the PBL model for teaching STEM must be eligible to receive this funding regardless of their socioeconomic status and student performance. Implementation of this policy will help strengthen the practical implementation of STEM education and attempt to close gaps in education both socioeconomic and opportunist.

Part of educational reform should also consist of passing a policy that would mandate all teacher preparation programs to offer mandatory courses in PBL education to support teachers in effectively teaching STEM. This will help increase teacher confidence and professionalism, and make them better equipped to support their students. To then support the implementation of this policy on a practical level, schools should have instructional coaches who can make sure that teachers receive constant training and support with materials and equipment needed for implementing PBL instruction in STEM. Additionally, PBL-trained STEM educators can become more mindful and intentional about differentiating instruction to meet the needs of diverse learners, including those from various socioeconomic backgrounds and levels of academic achievement. This policy takes a proactive move towards preparing educators for the challenges and opportunities of modern education, allowing them to better prepare students for the skills required in a high-demand workforce.

As many studies have pointed out, teachers struggle to teach PBL-based STEM due to the lack of a well-developed curriculum since it requires them to put in many overtime hours to prepare PBL-based STEM lessons that would effectively align with the state standards. Overworking teachers eventually experience burnout and consider leaving the profession which the US educational system cannot afford given the current teacher shortage, particularly in STEM. School districts need to create and adapt an accessible PBL STEM curriculum to decrease teacher frustration and planning stress and give them more opportunities to dive deeper into an already put-together and well-developed curriculum with the availability of many useful resources. The practical implementation of this policy can be accomplished by signing contracts with curriculum development firms, authors, STEM educators, and directors of education to create a student and teacher-friendly curriculum that aligns with state standards while providing the necessary rigor. Further implementation can consist of school and district coaches introducing and supporting teachers with the newly adapted curriculum. Over time, the curriculum should evolve with constant feedback from students, parents, as well as educators, and

administrators in regards to focusing on knowledge retention data and feedback regarding engagement and practicality in implantation.

Directions for Future Study

Many of the study cases in this review of the literature concentrated on different aspects and outcomes of PBL; however, additional research needs to be done to address areas that have not gotten enough attention and evaluation to provide a solid foundation for the study of PBL's impacts on student efficacy in STEM education. One of such underexplored areas in research is a quantitative and qualitative data comparison of students' achievement results between the traditional STEM schools and PBL STEM schools. Access to such research would be beneficial to the educational field because it would offer a practical understanding of PBL's potential to influence academic achievement in STEM education and shed light on the conflicting findings of the studies that have been done so far. Moving research forward in this direction would help educators explore PBL as a potentially effective way to help students reach their full academic potential.

Another area of study that would benefit from further attention is the exploration and examination of whether the PBL model of instruction may have a negative impact on some students' performance compared to traditional models of instruction. Leggett & Harrington (2019) conducted a study that revealed that although male students benefited from the PBL model of STEM instruction, female students performed more confidently in the traditional model of instruction. This provides an intriguing route for future research because it addresses the issue of equity in PBL-based instruction and emphasizes the need for additional research into whether PBL is appropriate for all students or should only be viewed as a good alternative for students who do not benefit from the traditional model of instruction.

More research was conducted on the effects of PBL implementation in STEM education in secondary schools in Western countries and Asia than in the United States. However, in terms of primary education, both regions lacked significant research. Lack of research availability in PBL-based STEM in primary education can also demonstrate a lack of data representation for the largest group of participants, as the number of students in K-12th grade education is significantly higher than in secondary education, resulting in misrepresentation and potentially incorrect interpretation of data. The lack of PBL research in primary education may also indicate PBL's unpopularity in primary education, resulting in a lack of investment in its development. Education can only benefit from valid research and it is therefore necessary for further studies to be conducted with a focus on the impact of PBL-based instruction in primary STEM education.

Summary

The aim of this project was to examine the impact that PBL could have on student efficacy in STEM courses. Understanding the evident role of STEM education in the digital world, this literature review examined a variety of sources, with a focus on studies that provided data gathered from experiments on the topic. Implementation of PBL in STEM courses can increase student efficacy by increasing students' motivation and engagement towards learning. Additionally, PBL can help increase student efficiency due to its relevance to real-world experiences and opportunity to learn and implement skills that are crucial to students in the twenty-first century. PBL also finds support in the UDL model for learning where implementation of both can support inclusiveness of teaching STEM and make sure that all students have access to equitable education and opportunities to succeed. PBL should be used in the classroom as an inclusive method of assessment where teachers provide students with opportunities to demonstrate their knowledge using multiple means while still maintaining rigor. Additionally, for PBL to be effective, teachers should introduce students to the concepts of PBL in the primary classes so that students can grasp the practical implications of PBL to study STEM before encountering more complex problems in higher grades that require more focus and depth on the content itself. Both students and teachers should be held to high expectations regarding the use of PBL in STEM education ensuring that standards are being met. Policies are no less crucial in the development of STEM education. According to the literature review, policies aimed at improving STEM education should include increasing school funding in STEM PBL classrooms, providing appropriate training for future teachers in teacher preparation programs to teach PBL in STEM, and developing and implementing quality PBL-based STEM curriculums. The lack of both quantitative and qualitative research to explore the various aspects of implementing PBL in STEM primary education requires additional research to ensure that educators have the best research-supported methods of teaching STEM while also ensuring that students are engaged and motivated to learn and can demonstrate high efficacy and achievement.

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Impact of Restorative Practices on the Development of Social and Emotional Growth of Elementary School Students

Christine Hsu

Abstract

Since the rise of social and emotional distress since the COVID-19 pandemic, restorative practices have emerged as strategies used to help students grow their social and emotional skills in the classroom. This project aimed to look at the current research on restorative practices that address social growth and emotional growth. Affective language and collaboration skills through establishing expectations and norms, morning meetings, and repairing harm together were types of restorative practices found related to growing social skills. For emotional skills, proactive approaches, responsive approaches, and mindfulness were discussed. Along with these findings, how these growths are measured were also researched. Students, teachers, principals, and parents were the individuals who determined the levels of social and emotional growth with the impact of restorative practices. With these types of restorative practices in mind, educators might consider using a variety of restorative practices during the year, for a group or individual students, and based on the needs of their students. Therefore, this can be accomplished by providing teachers with the preparation and support for using restorative practices in the classroom and continuing to include these practices in school policies.

Chapter 1: Introduction to the Project

Background

The concept of restorative practices (RPs) originates from the idea of community building and coming together to meet at one. Costello et al. (2019a) mention that the practice of humans sitting around a fire as a group is a tradition since the beginning of time. Individuals work together to create the fire and, as a result, they share heat. These traditions continue to develop through the years. Huang et al. (2023) describe how indigenous cultures utilize RPs to repair conflicts within the community and restore relationships by emphasizing accountability. Tribal leaders or community leaders facilitate meetings and conversations that focus on repairing and rebuilding interpersonal relationships. During these conversations, RPs also focus on preventing further conflict. Today, these practices are adopted by schools to address the social and emotional issues that are present in elementary school students.

Since the COVID-19 pandemic, a rise in the social and emotional

distress and an impact on the growth of these two skills has affected elementary schools across the globe. During the pandemic, parents express how their child's source of social interaction is mainly online, transitioning from one activity to the next poses difficulties, and negative emotions and behaviors are common (Eckardt et al., 2021). These social and emotional trends continue in the classroom, which led to the discussion of continuing with punitive disciplinary practices or shifting towards a stronger implementation of restorative practices. Moreover, administrators feel the need to incorporate RPs and community into their classroom to repair any social or emotional skills for students in their schools, especially after the pandemic (Gregory et al., 2021). The growth of social and emotional skills in elementary school students, due to the use of RPs, is seen through the change in behavior both learned and instilled as well as their attitudes.

Statement of the Problem

Students face stress, anxiety, and worry about what the future holds in response to the pandemic and being back at school post pandemic. According to Light-Stevenson and Elder (2023), expressing emotions ranges from a scale of minimal to significant, and 44% of elementary school students in their study faced significant worry or stress. Each student felt at least some worry of stress that is greater than a minimal amount of stress. Light-Stevenson and Elder (2023) also highlighted how untreated children who face emotional distress have a higher risk of missing out on crucial social experiences in school. Socially, students displayed behaviors where they struggled getting along with others. An interview conducted by Watts and Pattnaik (2023) found that kindergarten teachers noted that their students were used to working alone during the pandemic, which led them to grabbing tendencies rather than sharing. From this study, 67% of those teachers expressed that their students displayed negative behaviors and traits such as lying and acting out.

If these concerns are not addressed properly, students will only continue to exhibit the social and emotional distress and disconnect that significantly developed during the pandemic days and carried into the classroom once schools went back to in-person learning. According to Zakszeski and Rutherford (2021), schools use punitive disciplinary practices to handle behavior which is ineffective. In response to this, schools have also tried to use multi-tiered systems of support (MTSS) such as school-wide positive behavior interventions and supports (SWPBIS). Lee and Gagne (2020) discovered that schools use these practices to reduce and prevent behavior concerns, but they have trouble identifying the appropriate corrective consequences. As a result, schools turn to implementing the non punitive approach of RPs as an alternative to harsher consequences.

Purpose of the Project

The purpose of this project is to examine the impact of restorative practices on the development of social and emotional growth of elementary school students. The focus research questions are (a) which RPs impact the social growth of elementary school students, (b) which RPs impact the emotional growth of elementary school students, and (c) how can social and emotional growth be measured in elementary school students after the implementation of RPs? RP strategies included in the studies are student meetings, classroom conversations, social and emotional learning (SEL) programs. To measure how social and emotional growth of elementary school students is measured, researchers or schools collect data on how restorative practices impacted student behavior or collective situations that deal with emotions and social situations. Gaps in the literature with the length, types, and intentions with implementation of restorative practices. Schools that are included in the studies spend one year implementing restorative practices which do not allow for a comparison of the effectiveness of restorative practices from one year to the next. While there is a wide variety of commonly practiced restorative practices, there are other specific types of restorative practices that are not mentioned or found in research studies.

Theoretical Framework of the Project

Even though there has been a rise in RPs since the COVID-19 pandemic, these practices come from a long history of community building. Negara et al. (2022) defines the Social Cognitive Learning Theory which aligns with the implementation practices of RPs and the outcomes these practices have on the social and emotional growth of elementary school students. The growth that students face from the implementation of RPs is shown through their daily interactions with each other and the changed behavior. Costello et al. (2019a) lists the start of RPs in elementary school from retributive justice, which later led to restorative justice, and finally the implementation of RPs from the International Institute for Restorative Practices (IIRP).

In order to understand the basis of RPs, the basis of retributive and restorative justice needs to be understood. Huang et al. (2023) defines retributive justice as the focus on punishment as the response to negative behavior. On the other hand, Costello et al. (2019) describes that restorative justice focuses on repairing rather than punishing offenders through conferences and community circles with the offender, family members, and the other individuals involved. As a result, family members and individuals who are associated with the offender can provide their insight and perspective to help develop a plan. Schools adapted restorative justice in their classrooms but without retribution and punitive approaches (Darling-Hammond et al., 2020). Eventually, the IIRP brought forth the idea of RPs as an extension to restorative justice and with a focus on specific practices in the classroom. With RPs, teachers

and students work together to resolve and prevent issues as a team. Costello et al. (2019a) explain how the process of teachers and students working together on RPs range from an informal process to a formal process which is summarized in the Restorative Practices Continuum. The continuum starts with affective statements and questions, moves to small impromptu conversations, and ends with a circle or a formal conference. Costello et al. (2019a) mention how these practices are implemented daily where students experience various levels of structured RPs.

Albert Bandura's Social Cognitive Learning Theory (as cited in Negara et al., 2022) states that learning comes from observing others in a social setting where "individuals also analyze the utility and appropriateness of behaviors emerging from the modeled behavior reinforcement, and then they act based on their views about their skills and the expected effects of their activities" (p. 119). With the daily practice of RPs, students can learn from each other through these daily interactions which in turn impacts their social and emotional growth.

More specifically, Lave and Wenger's learning theory of community of practice (CoP) (as cited in Goodnough et al., 2020) is a concept within the Social Cognitive Learning Theory where a group interacts on a daily basis to work on shared concerns. Furthermore, Goodnough et al. (2020) list the three components for CoP as "the domain:...the community [that] are bound together by common practices...the community:...group members establish norms and ways of interacting that facilitate sharing and the creation of knowledge..., [and] the practice: ...shared...tools...that group members have developed over time" (p. 147). With RPs, students and teachers work together as a community to discuss a common topic and find solutions.

Definition of Key Terms

There are key terms that will be repeated throughout this project, and they are included to further understand the topic of this project.

Elementary school students: students that are in transitional kindergarten, kindergarten, first grade, second grade, third grade, fourth grade, or fifth grade.

Persistent challenging behaviors (PCBs): types of challenging behaviors that persist in students that impact their educational development. The way that students function socially and emotionally are negatively affected by PCBs (McGuire & Meadan, 2022).

Restorative practices (RPs): a community building and non punitive approach to handling and preventing conflict. There is no one definition of restorative practices because there are several approaches, types, and programs that can be used in classrooms (Huang et al., 2023).

Social Emotional Learning (SEL): a learning process that is part of the social and emotional development of students. This learning process allows

for teachers to help students regulate their emotions and behavior by making the right decisions (Surya et al., 2023).

Summary

The practice of community building and meeting together as a group are the beginnings of what we know today as RP in education. RP also originated from retributive justice which was later changed to restorative justice because the focus was on repairing behaviors rather than punishment. Later, RP initiatives were introduced in schools across the United States as an alternative approach to punitive discipline approaches which focus on negative consequences based on behavior. RPs in elementary schools are used to build a sense of community, repairing conflicts, and preventing conflicts among the students with the guidance of the teacher.

As a response to the heightened emotional and social distress from the pandemic, elementary schools increase the implementation of RPs in their classrooms to help with the growth of social and emotional skills. Students learn from their teacher and each other during daily practice of RPs which relates to the Social Cognitive Learning Theory and CoPs. RPs are daily practices within the classroom that are in the form of conversations or whole class meetings. CoP, a type of Social Cognitive Learning Theory, is where students work together as a community over a common topic.

The next chapter discusses the specific types of RP implementation in elementary schools and how they impact the social and emotional skills of elementary school students. One section focuses on the types of RPs that impact the social skills of elementary school students. Another section focuses on the types of RPs that impact the emotional skills of elementary school students. The ways in which social and emotional growth are measured follow these first two sections. The last chapter includes the practice and policy implications of the study along with future directions or study on the topic of RPs and the impact it has on the social and emotional skills of elementary school students.

Chapter 2: Review of Related Literature

Introduction

As a way to change the approach of using punitive practices against the increased social and emotional distress students faced after re-entering classrooms after the COVID-19 pandemic, schools adapted restorative practices (RPs) as a way to help students grow their social and emotional skills. This project observed the types of RPs and how they impact the social and emotional growth of students in elementary school. Additionally, the research described how community building circles and peacemaking circles are specific ways in which social growth in elementary school students are impacted by RPs. Furthermore, types of RPs that focused on the emotional

growth of elementary school students ranged from proactive approaches to responsive approaches. Mindfulness was another type of RP that focuses on emotional growth with mindful walking, breathing, and stretching as the main mindfulness practices used in the classroom. Research also showed that the social and emotional growth of elementary school students is measured by teacher observations, school data, and student surveys.

Restorative Practices Focused on Social Growth

Research that focused on RPs and social growth led to various types of community building circles. Establishing expectations and norms was one type of social skills circle that allows for various types of collaborative opportunities between students and the teacher (Costello et al., 2019b; McGuire & Meadan, 2022). Morning meetings were another type of circle mentioned in studies (Boyd & Edmiston, 2021; McGuire & Meaden, 2022) that also encouraged students to work together in groups.

Affective Language

Studies revealed that affective statements and affective questions are two key features of socially based RP (Boulden, 2021; Costello et al., 2019b). Costello et al. (2019b) explained how the way teachers speak to their students models how affective language impacts the responsive or reactive outcome with others. Furthermore, Costello et al. (2019b) described how the term “affective statements” is the same as “sharing an impact” (p. 10). Rather than only pointing out a negative action in relation to the student, Costello et al. (2019b) suggested for teachers to include the “I” statement in responses to help make students aware that the way they say impacts others. Additionally, using RP language to foster collaboration between students and being specific with desirable behavior were two of the ways in which teachers could help students build a positive classroom climate amongst each other (Costello et al., 2019b).

Similarly, Boulden (2021) highlighted the importance of specific wording when educators converse with students but in the form of affective questions. According to Boulden (2021), the RP process was built for students to feel safe enough to speak freely. In one example Boulden (2021) provided, the school counselor was conducting a RP meeting between two students and used affective language that promoted inclusivity and did not blame one student or another. Boulden (2021) noted how the school counselor did not start questions with “why” — since that could make students feel as if they were being interrogated — and rather asked students to further clarify what they meant. Furthermore, the school counselor used the word “we” to remind the students that there was a sense of community between the two students involved in the meeting despite their differences. As a result of this specific type of RP language, the two students were able to talk through the issue and resolve it together. Moreover, the students also used

the “we” language in their responses which they learned from listening to the RP language used during the meeting.

In addition to the wording of affective language, the two studies (Boulden, 2021; Costello et al., 2019b) also indicated the importance of the type of social environment when using affective language whether they are statements or questions. Costello et al. (2019b) emphasized the importance of knowing when it is appropriate to use affective statements in a private versus public situation. For example, the conference between the school counselor and the two students in Boulden’s (2021) study was not addressed with the whole class but rather in a private setting with only the individuals involved in the incident. In another study, a third grade teacher posed effective RP questions and the students worked collaboratively to answer them (Gray, 2021). Moreover, the teacher highlighted the fact she did not intervene since the students were focused on problem solving together as a team. The students were used to the RP questions and effectively collaborating as a team. In other cases, it might be appropriate for teachers to bring an issue to the whole class using restorative circles.

Community Building Circles

According to Mas-Expósito (2022), classroom environments which promoted positive social skills and interactions led to an equally positive social development among students. Moreover, Garnett et al. (2023) collected student opinions on the successes of experiences with community building circles. Students reported that circles allowed them to connect with their classmates and say what they felt. Additionally, the students mentioned how they felt as if the circles allowed for them to express important ideas and opinions. One student described how they noticed that classmates who did not talk often were given a space to talk with RPs and a sense of classroom community was present.

The consistency of community building circles was also present in the study from Garnett et al. (2023), surveys were given to students that were in a classroom that utilized community building circles. For the survey, 107 students indicated not really, sometimes for each survey item. The results concluded that 79% of the students indicated that their teacher used community circles often. 36.9% of students sometimes participated in sharing their ideas during circles and 41.7% of students often participated in sharing. Community building focused circles is a type of RP that teachers have utilized in their classrooms to encourage collaboration. With the need to address the social difficulties faced in classrooms, researchers suggested RPs to help students with managing their social growth. Establishing expectations and norms and morning meetings were two specific types of community building circles researchers discussed (Costello et al., 2019b; McGuire & Meadan, 2022).

Establishing Expectations and Norms

Researchers indicated the need for establishing expectations and norms as a collaborative RPs between students, with the teacher as the facilitator, or between the teacher and the students. Costello et al. (2019b) described how rather than the teacher setting the expectations, students work collaboratively to create norms that they agree on as a class. According to data from a RP integrated program, Costello et al. (2019b) found that students with persistent challenging behaviors complied with the classroom norms since they were taking responsibility for their behavior.

On the other hand, McGuire and Meadan (2022) explained how establishing expectations is an important practice to maintain social expectations from the beginning of the year. Furthermore, they described how practicing these expectations is the same as how teachers guide students on practicing routines and rules. McGuire and Meadan (2022) emphasized how expectations are not stagnant and provided a sample procedure for teaching expectations. Introducing the expectations, explaining the importance of these expectations, practicing them, and providing praise and feedback were the steps described for teachers to provide students with new expectations.

Research from these studies also emphasized how establishing classroom expectations and norms would benefit students in a circle format. Moreover, Costello et al. (2019b) argued that the traditional method of teaching is disadvantageous for social interactions compared to the circle method. McGuire and Meadan (2022) recommended that part of teachers modeling social expectations include encouraging students to participate in circle formatted meetings. Students would be able to see each other in this format when the teacher socially promotes a specific student during the meeting.

Morning Meetings

With regards to social growth with the impact of RPs, researchers concluded that morning meetings were a common way in which teachers utilized socially focused RPs in their classrooms. A series of studies from Boyd and Edmiston (2021), which all focused on utilizing morning meetings with a democratic approach, examined how teachers gave students the agency to collectively make their own decisions. The utilization of the morning meeting in this context fostered equality, community building, and social interactions between students (Boyd & Edmiston, 2021). One of the studies explained a specific example where there were different social inclusive practices within a morning meeting in a second grade classroom. The meeting started with a greeting and followed with group activities among the 25 students. More specifically, the group activities involved role play where students had the opportunity to practice social skills with interviews.

Another RP example from Boyd and Edmiston (2021) explained the social benefits of a morning meeting in the classroom through collaboration. Within this third grade classroom, the teacher utilized morning meetings as

a way for students to strengthen their social skills with story writing. Students connected their social relationships to events in school, outside of school, and to each other (Boyd & Edmiston, 2021). Additionally, students had the opportunity to work in groups on their writing and ask each other questions during the writing process. At the end of their writing process, they worked with professionals to perform their stories for an audience. The process of the morning meeting in this classroom provided students with a variety of opportunities for social interaction.

Research on morning meetings also led to the relationship between this type of RP and persistent challenging behaviors (PCBs). McGuire and Meadan (2022) discovered that incorporating classroom morning meetings was a step educators took towards PCB student inclusion. Decreased time in the classroom also negatively impacted their social development but time in the classroom benefited PCB students since they were able to socialize with their teacher and classmates (McGuire & Meadan, 2022). Along with these practices, McGuire and Meadan (2022) also encouraged morning meetings as a way in which teachers established positive relationships through conversations that allow students to identify each other's strengths and highlight them.

Moreover, while McGuire and Meadan (2022) highlighted the importance of teachers having a strong understanding of each student in order to properly and effectively navigate the social interactions in the classroom during morning meetings, the studies from Boyd and Edmiston (2021) clarified that democratic based morning meetings does not reduce the teacher's role but rather shifts the teacher's position to moderator. This concludes that the impact of RPs that focuses on social skills is a process that strongly relies on teacher's preparation and role in the classroom. With that being said, the studies lacked the specific types of preparation and knowledge these teachers needed for morning meetings that focus on social interactions.

Repairing Harm Together

Studies also showed that circles can foster understanding and repair harm between students through a collaborative approach. Repairing harm was described in two categories that could be done separately or together. Concrete reparation was explained as repairing or replacing something. Moreover, symbolic reparation was explained as saying or doing something that repairs harm and in turn creates peace (Costello et al., 2019b).

In one situation explained in a study conducted by Kelly et al. (2023) a fourth grade teacher called for a RP class meeting to address a teasing incident that happened in class. The teacher overheard one student teasing another student over their shoes, and read the story *Those Shoes* to the class followed by a class conversation. Students responded to the story and discussed their own experiences with how they feel about the topic of being teased because of what they are wearing. Kelly et al. (2023) noted that after

students respectfully chimed in to share their personal experiences, one of the students came up with a solution to the problem and the whole class nodded in agreement.

According to studies from Gregory et al. (2020) explained how RPs for repairing harm can be accomplished in a collaborative setting rather than in isolation. For example, one teacher explained how keeping the student who displayed harmful behavior in the classroom, rather than removing them from the classroom due to their behavior, reminded the student that they are part of the classroom community despite what they did (Gregory et al., 2020). Additionally, another teacher from the same study shared that they hold students accountable for their actions through classroom conversations followed by time for reflection (Gregory et al., 2020). An RP leader continued to add that since students were held accountable for their actions they held each other accountable as well. As a result, students perceived the classroom as safe spaces where they could work together as a team.

Restorative Practices Focused on Emotional Growth

Further research showed that RPs not only impacted social skills in elementary school students, but they also impacted their emotional skills. Costello et al. (2019b) categorized emotionally focused RPs into proactive approaches and responsive approaches. Teaching students how to handle emotions and the process of checking in and checking out were the two main proactive approaches that were found in proactive approaches. On the other hand, research on responsive approaches addressed emotions after a conflict occurred.

Proactive Approaches

Costello et al. (2019b) described the purpose of the proactive approaches as a strategy to bring students together as a community at the beginning of the year. As a result, they would feel comfortable around each other enough to work on emotions and build their emotional skills. Proactive circles were also described as preventing problems before they occur and how to handle emotional distress from serious problems at school (Costello et al., 2019a). Handling emotions was one type of proactive approach found in the research.

One study from Surya et al. (2023) indicated benefits of social and emotional learning (SEL) practices that focus on handling emotions. For example, lessons included from an SEL program taught students how to manage their own emotions as well as identifying the way others feel. Surya et al. (2023) mentioned that the results of this program included students gaining relationship building skills and knowing how to handle feelings of anxiety and fear. In a study conducted by Stran et al. (2020), fourth grade students went through 12 sessions to learn how to regulate their emotions. An example goal of a session was increasing emotional awareness, and to do this teachers helped students through activities and strategies that allowed them to find ways to appropriately express their emotions. As a result of this intervention,

teachers reported that their students improved their emotional skills. Students that were waitlisted to receive the intervention showed a higher frequency in behavioral issues due to not knowing how to handle emotions as well as the group that received the interventions. After the students on the waitlist received the intervention, their problem behaviors decreased which meant that they were able to better handle their emotions (Stran et al., 2020).

Checking In and Checking Out

In addition to handling emotions, the RP strategy of checking in and checking out used in elementary schools has been utilized to give students the opportunity to express how they feel at the beginning of the day and at a point where the time to reflect is appropriate (Costello et al., 2019a). In one study from Kladis et al. (2023), four students were selected to participate in a check out and check in process with their teachers based on their emotional levels of engagement. Three of the four students selected were in fourth grade and displayed internalizing and externalizing emotional behaviors such as shy, lonely, sad, or anxious. Before the students were introduced to the check out and check in system, they exhibited low risk or moderate risk as seen in Table 1 before and after check in and check out.

Table 1
Student Demographic Information and Student Risk Screening Scale–Internalizing Behaviors

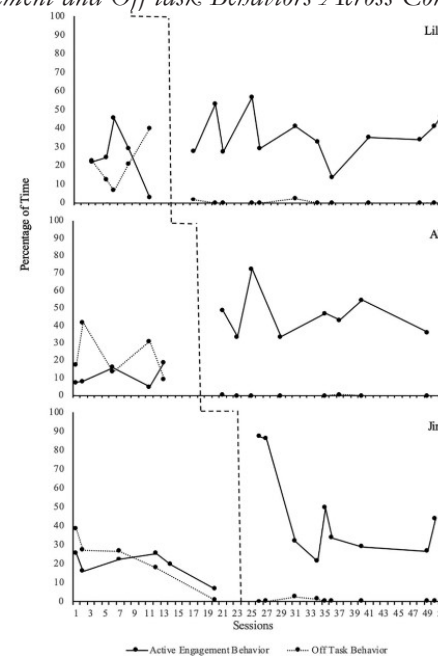
Demographics	Students							
	Warren		Lily		Alex		Jin	
Age (years)	11		10		9		10	
Grade	6		4		4		4	
Race/ethnicity	White		White		Hispanic		Asian	
Gender	Male		Female		Male		Female	
SRSS-15 items	Pre CICO	Post CICO	Pre CICO	Post CICO	Pre CICO	Post CICO	Pre CICO	Post CICO
Emotionally flat	2	1	0	1	3	3	0	2
Shy, withdrawn	3	1	3	2	3	3	3	2
Sad, depressed	1	1	1	2	3	3	0	0
Anxious	3	2	3	2	3	3	3	1
Lonely	1	1	0	1	1	1	0	0
Total score	10	6	7	8	13	12	6	5

Note. Scores 0 to 1 = low risk; Scores 2 to 3 = moderate risk; Scores 4 to 15 = high risk. SRSS-15 = Student Risk Screening Scale–Internalizing 5; CICO = Check-In Check-Out.

Note. From “Effects of Check-In Check-Out on Engagement of Students Demonstrating Internalizing Behaviors in an Elementary School Setting,” by K. Kladis, L. S. Hawken, R. E. O’Neill, A. J. Fischer, K. S. Fuoco, B. V. O’Keeffe, S. A. & Kiuahara, 2023, Behavioral Disorders, 48, p. 86. Copyright 2023.

Furthermore, these students were further given a daily progress report for checking in and checking out since they continued to display internalizing and externalizing emotional behaviors even after check in and check out. The daily progress report allowed for teachers to check in with students about their behavior during the day. As a result, Kladis et al. (2023) collected data on the percentage of time these students had active engagement behaviors and off task behaviors. Figure 1 showed how as the check in and check out sessions progressed using the Daily Progress Report, the percentage of time students spent on active engagement behavior remained above the percentage of time students spent on off task behavior.

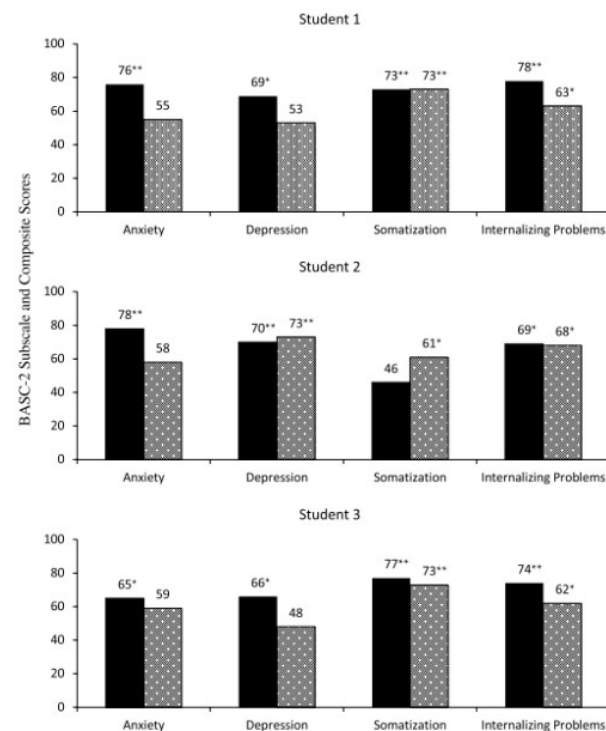
Figure 1
Active Engagement and Off-task Behaviors Across Conditions



Note. From “Effects of Check-In Check-Out on Engagement of Students Demonstrating Internalizing Behaviors in an Elementary School Setting,” by K. Kladis, L. S. Hawken, R. E. O’Neill, A. J. Fischer, K. S. Fuoco, B. V. O’Keeffe, S. A. & Kiuahara, 2023, Behavioral Disorders, 48, p. 92. Copyright 2023.

According to Mitchell et al. (2021) check in and check out was starting to emerge as a strategy for teachers to use with students who expressed internalizing behaviors and later developed emotional disorders such as anxiety or negative moods. Mitchell et al. (2021) conducted a study where one second grade and two kindergarten teachers provided their students with check in and check out intervention. According to Figure 2, all three students displayed a decrease in anxiety and internalizing problems. Depression decreased for one of the kindergarten students and for the second grade student. Somatization decreased from 77 to 73 for one of the kindergarten students. The results came from the second edition of the *Behavior Assessment Scale for Children* which is a standardized rating scale (Mitchell et al., 2021).

Figure 2
Teacher Pre- and Post-BASC-2 ratings of Student Behavior



Note. From “A Daily Check-In/Check-Out Intervention for Students with Internalizing Concerns,” by B. S. Mitchell, T. J. Lewis, & M. Stormont, 2021, *Journal of Behavioral Education*, 30, p. 193. Copyright 2020.

Responsive Approaches

Researchers also categorized emotionally focused RPs in responsive

approaches (Costello et al., 2019b). According to the research, responsive approaches could happen at any point during the school day and are usually in response to behavioral concerns (Costello et al., 2019b; Kelly et al., 2023). More specifically, responsive approaches were described as a process which brings affected individuals of a community together to address how they feel about the specific situation which impacts all of them (Costello et al., 2019b).

Costello et al. (2019b) described how when there is a call for a RP circle for behavioral problems, students have the opportunity to express their emotions in regards to a certain situation. The researchers explained an incident with a teacher who noticed something missing from her desk. The students expressed their empathy for the teacher and the teacher ended the conversation with how talking to the students made them feel better (Costello et al., 2019b). In another situation from the same research, the teacher expressed emotions of anger and frustration when an item on their desk was found broken (Costello et al., 2019b). When the teacher called for a meeting the student who broke the item admitted what they had done and sincerely apologized. The student offered to pay for the broken item, but the teacher explained how they appreciated how the student acknowledged their role in the situation with honesty.

In another example from Kelly et al. (2023), two students in a fourth grade classroom were physically violent towards each other which led to a mandatory class meeting. The teacher read a story, *Be Strong*, so the students could discuss the theme of nonphysical strength. At the end of the reading, the students came together to discuss how they can show strengths in different situations at school without using violence. Kelly et al. (2023) also explained how students shared feelings of frustration. Moreover, feelings and emotions were validated when all of the students were able to add their opinions to a class chart on how they can be strong and what they are strong at.

Mindfulness

As a way to address the heightened emotional distress that students face throughout the school day, Armstrong (2019) evaluated mindfulness as a strategy that aligns with existing educational practices such as RPs. Armstrong (2019) emphasized that mindfulness allows for students to become self-aware through their feelings, emotions, and thoughts. Studies that looked into mindful breathing (McFall & Jolivet, 2022; Lee et al., 2023) and studies that looked into mindful based interventions (Kempf et al., 2023; Suárez-García et al., 2020) suggested mindfulness as a way to help students regulate their emotions.

Mindful Breathing

In a study from McFall and Jolivet (2022), students were able to

better regulate their emotions after using mindful breathing exercises. Moreover, mindful breathing was an even greater benefit for the students who had emotional behavior disorders since they were better able to regulate their emotions (Gabriely et al., 2020, as cited by McFall and Jolivet, 2022). This study also described specific types of mindfulness breathing which are called belly breathing and 4-7-8 breathing. If students exhibited anxiety or stress throughout the day belly breathing was another mindfulness strategy that teachers in the study used. Belly breathing was recommended for younger students and to regulate emotions. The goal of the 4-7-8 breathing exercise was to help students with feelings of anger, reducing anxiety and stress, and to calm them down during transitions from one activity to another.

Research from Lee et al. (2023) described how mindfulness allows for students to acknowledge and understand their feelings and emotions. Lee et al. (2023) suggested visual imagery as a way teachers involved their students in mindfulness. Blowing out a candle or blowing up a balloon were two suggestions that students could relate to and visual as they work on their breathing. Moreover, teachers could also follow a script for each of these activities where they remind students that breathing can help with feelings of calmness and happiness. For the candles, teachers could tell students to visualize a birthday cake and blow out candles. For the balloons, teachers could tell students to blow up a balloon of their choice and then watch the balloon fly around them. Furthermore, Lee et al. (2023) emphasized that these practices encourage counting while taking deep breaths.

McFall and Jolivet (2022) and Lee et al. (2023) provided suggestions for teachers on how to utilize mindful breathing in their classrooms. With that being said, these suggestions were only one of the many ways in which teachers could use mindful breathing in the classroom. McFall and Jolivet (2022) used the word “may” to indicate that the suggestions for belly breathing and 4-7-8 could work for one classroom but not another. Lee et al. (2023) noted that the mindfulness exercises described in the article could be adapted or adjusted to meet the needs of each student. Additionally, both studies emphasized the importance of consistency and availability with mindfulness breathing. Mindful breathing was described as a tool that students could use when they are feeling emotions of distress or discomfort, and specific types of mindfulness breathing could be used at any point of the school day. With that being said, mindfulness is a tool that students could use to regulate emotions that arise at any time and could be introduced in a particular way that fits the needs of each student (Lee et al., 2023; McFall & Jolivet, 2022).

Mindful Interventions

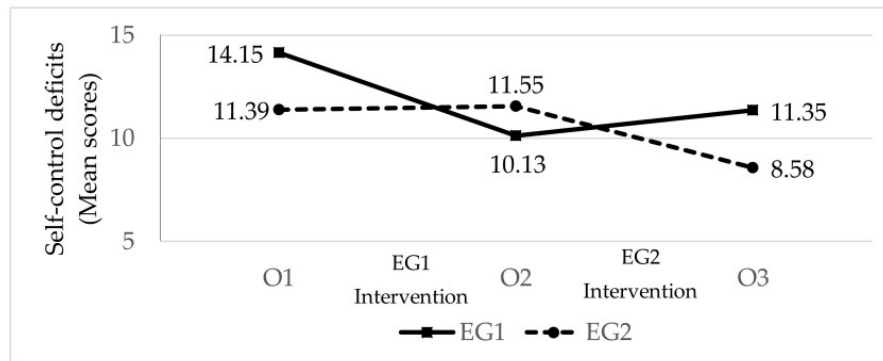
In addition to mindfulness breathing, mindfulness interventions were also described as ways for teachers to help students regulate their emotions. Kempf et al. (2023) conducted a study where participants in fifth grade were

asked questions based on a mindfulness intervention, Still Quiet Place (SQP). According to the study, SQP introduced students to mindfulness exercises that focused on handling stressors (Semple et al., 2017, as cited in Kempf et al., 2023). One of the participants found that going to their SQP helped them when they were mad or upset. Another participant noted that SQP and the practice of mindfulness helped them with decision making.

Kempf et al. (2023) also mentioned that students became aware of their conflicting emotions and came up with their own decisions and thoughts without the desire to imitate the actions of peers with unexpected behaviors or emotions. One student participant described how they were able to gather the thoughts they wanted to keep in their mind through the practice of mindfulness. Another student participant noted how they were able to replace unkind thoughts with thoughts of kindness with the use of SQP. Two other students were aware of conflicting emotions through the various mindfulness activities. Kempf et al. (2023) revealed how these students verbally expressed feelings of sadness, happiness, confusion, and calmness all at once and related these feelings to their own lives.

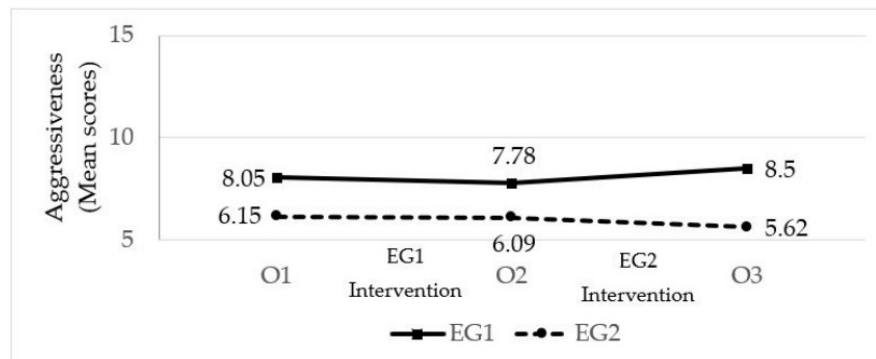
According to a study conducted by Suárez-García et al. (2020), third grade students were exposed to a mindfulness intervention from their teachers which included awareness of breathing, classroom activities, and kindness. There were two groups of students that received the intervention program. The first experimental group (EG1) received the mindfulness intervention first and then did not receive the intervention after the second observation (O2). On the other hand, the second experimental group (EG2) did not receive the intervention before O2 and then received the mindfulness intervention after O2. Attentional problems and self-control deficits were measurements for the impact of mindfulness on the students. Suárez-García et al. (2020) noted that the intervention program aimed to help students with relaxing the mind and avoiding too much focus on negative emotions and attitudes. According to Figure 2, self-control deficits for EG1 decreased after mindfulness intervention and increased after not receiving mindfulness intervention. For EG2, self-control deficits increased without intervention and then decreased after mindfulness intervention. The same trends were displayed in Figure 3 and Figure 4 where mindfulness intervention decreased the levels of aggressiveness in students.

Figure 3
The Effect of the Intervention on Pupils' Self-control Deficits



Note. From "The effect of a mindfulness-based intervention on attention, self-control, and aggressiveness in primary school pupils," by Z. Suárez-García, D. Álvarez-García, P. García-Redondo, & C. Rodríguez, 2020, *International Journal of Environmental Research and Public Health*, 17, p. 9. Copyright 2020.

Figure 4
The Effect of the Intervention on Pupil Aggressiveness



Note. From "The effect of a mindfulness-based intervention on attention, self-control, and aggressiveness in primary school pupils," by Z. Suárez-García, D. Álvarez-García, P. García-Redondo, & C. Rodríguez, 2020, *International Journal of Environmental Research and Public Health*, 17, p. 9. Copyright 2020.

How Social and Emotional Growth is Measured

Studies showed that teacher observations, school data, and student observations were the main methods for measuring social and emotional growth in elementary school students that were exposed to RPs in their classrooms and schools. Teacher observations included what teachers noticed with student interactions. Teachers also observed how students participated

in class with the use of RPs. For school data, the rate of out of school suspensions after the use of RPs and the decisions from educators and administrators determined the effectiveness of RPs in impacting student social and emotional growth. Student opinions included surveys and student interviews where they had the opportunity to express the impact of RPs on their social and emotional growth in the classroom as the year progressed.

Teacher Observations

Research on how social and emotional growth is measured led to teacher observations on student interactions and class participation with the use of RP strategies (Boyd & Edmitson, 2021; Gray, 2021). After creating a classroom community that was rooted in RPs, teachers described noticeable impacts on student interactions and classroom participation. The research found on teacher observations led to qualitative data in regards to the student interactions with each other. Additionally, noticing collaboration as one of the results of RPs was one of the main types of teacher observations.

In an observation from one of the studies conducted by Boyd and Edmitson (2021), a second grade teacher noticed that community building and social activities led to students sharing feelings such as laughter and frustration. One of these activities involved creating classroom greetings. Moreover, Boyd and Edmitson (2021) noted that these students were socializing in a way where they were continuously participating and accepting ways of interacting as a group. They were actively listening to each other and continued to collaborate together as they further developed their classroom handshake into other greetings. Collaborating as a way to problem solve was also a common theme found in teacher observations related to RPs. In another observation from Gray (2021), a different third grade teacher observed two of her students handle a situation where one student was distracting the other. Since the teacher had created a safe classroom environment using the RP of affective language, the students were able to respectfully resolve the situation.

Another type of teacher observation found in the research were students individually feeling a sense of comfort in socializing in the classroom setting. Furthermore, this sense of comfort was seen in students individually. In one study, a fourth grade teacher recalled an incident where one of her students raised their hand to express their frustration with the current math lesson (Gray, 2021). This example showed the student felt comfortable enough in the classroom environment to raise their hand and express their feelings to the teacher and the whole class. In another study from Garnett et al. (2020), one teacher explained how one of their students went from not wanting to hold the talking piece for the RP meeting from holding onto the piece for almost half a minute. In other words, students that did not feel comfortable speaking in front of the whole class eventually became comfortable with the continued use of RPs in the classroom. Another teacher in the same study noticed

that students had days where they participated in RP circles and other days where they did not participate as much, but overall the students became comfortable as the year went along with participating (Garnett et al., 2020).

Teacher observations of students feeling comfortable enough to socialize in the classroom after using RPs was also seen collectively in students. Gray (2021) described how a third grade teacher asked the students RP based questions in response to students breaking classroom rules. As a result, the students respectfully and responsibly participated in determining the appropriate consequences for their actions as a class. Similarly, a study from Boyd and Edmitson (2021) described a situation with a student who started off the school year with no friends. Since the teacher focused on building a classroom community, the other students in the same class included that student in activities. That student grew socially and made progress with creating relationships with other kids.

Student Reflections

With the use of RPs in the classroom, students also had their insight on how they view RPs which impacted their social and emotional skills. Surveys were one mode of collecting student perspective. Davis et al. (2023) utilized student surveys which revealed that there were signs of social growth and emotional growth with elementary school students who were introduced to RPs in the classroom. Another method to collect data on student opinions on how RPs impacted their social and emotional growth were student interviews. Skrzypek et al. (2020) interviewed elementary school students that were used to RP circles in their classroom.

In interviews conducted by Skrzypek et al. (2020), students were asked what they appreciated from the use of RP circles in their classrooms. Fifth grade students were interviewed and they explained how RP circles gave them valuable time to work collaboratively and interact with their classmates. One student mentioned how she enjoyed the fact that she was able to talk about her goals and how she felt during RP meetings. Another student mentioned how she appreciated how RP circles allowed her to express her feelings rather than internalizing them. Other fifth grade students from the study concluded how they were able to learn from their mistakes and were aware of social classroom expectations through the use of RPs in the classroom (Skrzypek et al., 2020). Students explained how they were able to learn new things as well as attempting to learn about each other's perspectives and emotions.

According to one survey conducted to ask students about their opinion on how RPs focused on social and emotional skills in their schools impacted them, students answered statements in regards to how they felt which were categorized into (a) RP benefit, (b) RP quality, (c) school support, (d) repair harm, and (e) feeling left out (Davis et al., 2023). On average, the

students answered three, four, or five for each statement which stood for (a) sometimes, (b) often, or (c) always as seen in Table 2. These surveys were conducted after students participated in RP circles, collaborated groups with classmates, and connected with peers in the classroom.

Table 2

Variable Descriptions and Descriptive Statistics

Table 2. Variable descriptions and descriptive statistics.

Item	Question/Construct	Mean	SD
RP Benefit	Perceived benefits students derive from participating in RP circles		
RPWKBTR	Doing RP circles has helped me work better with others.	3.28	1.17
RPENJTM	I enjoy my time in RP circles.	3.48	1.11
RPCLMCLR	Being in an RP circle helps me calm down and think more clearly.	3.25	1.19
RPCNCTST	During RP circles, I am making connections with students I wasn't friends with before.	2.97	1.16
RP Quality	Students' perceptions of the circles themselves		
RPFLSAFE	I feel safe participating in RP circles.	4.29	0.95
RPLISTEN	I feel I am listened to during RP circles.	4.06	0.87
RPTCHFIE	My teacher uses RP circles as a time for us to share feelings, ideas, and experiences.	4.13	1.02
RPSTUTKPRT	Students are encouraged to take part in helping run classroom RP circles.	3.40	1.24
School support	Students' perceptions of how they are treated by adults in the school		
ADLTCARE	At this school, there are adults who care about what happens to me.	4.42	0.91
ADLTFAIR	The adults at school treat me and others fairly.	4.37	0.94
SCHRESP	Our school shows respect for people from all backgrounds and cultures.	4.62	0.73
ADLTPRBLM	If I have a problem, there are adults in the school I can talk to.	4.15	1.13
ADLTRESP	I feel respected by the adults at school.	4.30	0.91
Repair harm	Students' perceptions of treatment by adults when they misbehave		
HARMOPP	If I cause harm, I am given an opportunity to understand the harm and make it right.	4.07	1.15
MISQUEST	If I misbehave, my teachers ask me questions to hear my side of the story.	3.83	1.17
MISRESP	If I misbehave, my teachers treat me with respect, are calm, and are open to what I have to say.	3.86	1.15
Feeling Left Out	Students' perceptions of being left by peers and adults		
PEERLEFTOUT*	I feel left out by peers because of who I am. Examples include your race, disability, how much money your family has, what language you speak, your gender, or who you have a crush on.	1.62	0.95
ADLTLEFTOUT*	I feel left out by adults because of who I am. Examples include your race, disability, how much money your family has, what language you speak, your gender, or who you have a crush on.	1.43	0.88

*Note: Items are reversed scaled. Students who felt more left out have lower scores than those who did not feel left out.

Note. From "Development and validation of a multi-domain survey assessing student experiences with school-based restorative practices implementation: Community based participatory research at work for school equity," by A. S. Davis, B. Garnett, L. Smith, M. Moore, H. Sparks, L. Bedinger, & J. Kidde, 2023, *Journal of Academic Optimism*, 98, p. 11. Copyright 2023.

Principal and Parent Interviews

Research on how social and emotional growth is measured also led to interviews with principals and parents on whether the use of RPs led to the growth of social and emotional skills in elementary school students (Garnett et al., 2023; Gregory et al., 2021). Researchers also found that the impact of RPs on social and emotional skills for elementary school students was collected through interviews with principals and parents. According to a

qualitative study from Gregory et al. (2021) 89% of school principals from the study determined that their students had the desire to work together to take charge of RPs inside their classroom during meetings and at their school. Another school principal from the same study explained how the goal of RPs was to provide students to advocate for themselves, which is why they decided to continue RPs at their schools (Gregory et al., 2021). Similarly, Garnett et al. (2023) found that parents saw the benefits of RPs in schools. One of the parents described how they saw the benefits of RP circles in a social context since they felt as if RP circles encouraged community building and working with others on a common topic.

These researchers showed that even though principals and parents saw the benefits of RPs on the social and emotional growth of elementary school students, there were some concerns about the continuing growth of social and emotional skills in elementary school students with the use of RPs. For example, even though one parent voiced their agreement with RPs in schools, they wondered how RPs differed from positive behavioral intervention supports (PBIS) (Garnett et al., 2023). In order to try to help others understand the RP initiatives used in schools, parents started organizations such as Parents Defending Education (2024) to collect this information across the states. Additionally, Gregory et al. (2021) suggested that principals could look at how schools use PBIS, or other initiatives, to provide insights on how to efficiently continue RPs year after year.

Summary

Based on the studies collected on the RPs that impact the social and emotional growth of elementary school students, researchers categorize the types of RPs for these two categories and discover ways in which social and emotional growth are measured. Moreover, RPs focused on social growth include affective language and community building circles. RPs focused on emotional growth come in the form of proactive approaches, responsive approaches, and mindfulness. The way in which these growth are measured come from the teachers, parents, principles and students.

This chapter reveals how affective language comes in the form of questions or statements, using the words “we” and “I” with students, is a type of RP used for building social skills. Knowing when to address situations in a public or private setting is also an important aspect of affective language. Community building circles in the form of establishing expectations and norms and morning meetings are two types of RP circles that focus on social skills. Students are brought together in a way where they have room to collaborate and work with each other on a problem or situation that arises during school. One of these situations can be repairing harm together as a class and finding solutions to any problems. For RPs focused on emotional skills, proactive approaches, responsive approaches, and mindfulness

were discussed. This includes checking in and checking out along with handling behavioral issues. The way social and emotional growth is measured is through student interviews, teacher observations and interviews, and interviews from parents and principals as well.

The following chapter explores the practice implications from the study and the policy implications as well. While the use of RPs proved to impact the social and emotional growth of students, the time schools spent on using RPs was only a year or two. Data also yielded stronger results on social and emotional growth with RP strategies in alignment with other school initiatives such as SEL. Other problems with implementing RPs were also addressed in the studies. These issues were teachers feeling lack of support to include RPs in their classrooms and push back on using RPs due to limited information on them.

Chapter 3: Implications

Introduction

The research in this project focused on the impact of restorative practices (RPs) on the social and emotional growth of elementary school students to address a recent problem in the field of education. Since the pandemic, there has been an increase in social and emotional distress in elementary school students which became apparent in the classroom. As a result, looking for ways to help with the growth of social and emotional skills for these students in ways that do not require punitive approaches led to the use of RPs in schools and research on specific types of RPs.

This chapter provides three conclusive points from the literature review. The conclusions made are based on the essential RPs for students’ social and emotional growth as well as the type of data collected to measure these growths. Moreover, this chapter addresses practice implications for RP implementation in the classroom and policy implications in regards to RP implementation in schools. As a result, recommendations for future studies and a description of limitations are included at the end of this chapter.

Conclusions

The three research questions for this project are: (a) which RPs impact the social growth of elementary school students, (b) which RPs impact the emotional growth of elementary school students, and (c) how can social and emotional growth be measured in elementary school students after the implementation of RPs? These questions are important to investigate with the rise of social and emotional distress in elementary school students especially since the COVID-19 pandemic. Knowing which RPs focus on social growth and which ones focus on emotional growth helps educators in evaluating their use of this non-punitive approach in their classrooms and overall impacts their students.

First, the types of RPs which focus on the social growth of elementary school students are shown to emphasize the importance of language and establishing a classroom community through meetings. Starting off with affective language, in the form of statements and questions, and establishing expectations are RP strategies used by the teacher to help students understand that the way they communicate impacts how others react (Boulden, 2021; Costello et al., 2019b). Establishing expectations and introducing morning meetings are also types of RPs that allow opportunities for collaboration and students to interact with one another (Boyd & Edmiston, 2021; McGuire & Meadan, 2022). Additionally, conversations to repair harm is another type of RP meeting that can happen in the classroom with the help of classmates (Gregory et al., 2020; Kelly et al., 2023). By establishing these RP elements in the classroom, students can then feel comfortable in collaborative conversations where they repair harm together, which makes these crucial steps in implementing RPs that are focused on social growth. The theme of collaboration is also important in RPs that focus on handling emotions.

Second, in regards to the types of RPs that focus on emotional growth, there were specific types of approaches found in the studies. These approaches are proactive approaches, responsive approaches, and mindfulness. Findings showed students individually and collaboratively learning how to handle their own emotions and emotions from others. Checking in and checking out was one way in which students were able to evaluate their own emotions (Costello et al., 2019a; Kladis et al., 2023; Mitchell et al., 2021). Mindfulness was also an RP strategy that was described as an individual and collaborative process such as mindful breathing or mindful based interventions (Armstrong, 2019; Kemp et al., 2023; Lee et al., 2023; McFall & Jolivette, 2022; Suárez-García et al., 2023). This reveals that while the RP strategy plays a positive role in the emotional growth of elementary school students, collaboration and cooperation from others is also essential.

Lastly, the way social and emotional growth for elementary school students was measured came from a variety of groups. Qualitative data from students, teachers, parents, and principals revealed growth in social and emotional skills after the implementation of RPs. The data from these groups were collected through interviews, surveys, and observations. While the growth measured for the teachers and students came directly from the classroom, the observations and interviews from principals and parents were from an outside of the classroom perspective (Boyd & Edmiston, 2021; Davis et al., 2023; Garnett et al., 2020; Gray, 2021; Gregory et al., 2021; Skrzypek et al., 2020). This reveals that social and emotional growth can not only be measured through the form of interviews, observations, and other forms of qualitative data but also in different environments.

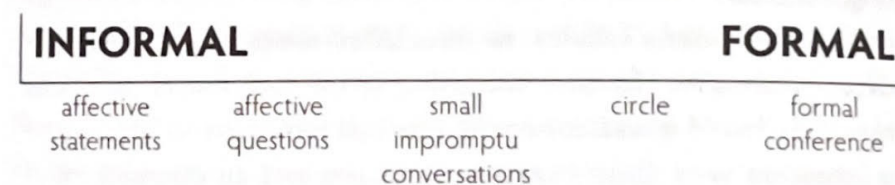
Practice Implications

With a variety of RPs available with the intention of impacting the social and emotional growth of elementary school students, researchers have found strengths and benefits in each one individually. While there are collaboratively based RPs that are universally taught in each classroom, such as meetings or circles, certain RPs might work better for one student versus another. According to Gregory et al. (2021), each student is different with their own needs and how this concept needs to be taken into consideration when it comes to the type of approach using RPs. This case is also true with using RPs collectively rather than using one specific type in a classroom.

A combination of a variety of RP strategies (affective language, RP circles, and mindfulness) throughout the school year would provide the class with a foundation for working together as a group or in pairs. Additionally, this would help students and teachers become comfortable with RPs. According to the RPs continuum in Figure 5, the types of RPs on the continuum go from informal to formal. The informal RPs start with affective statements, then conversations, to meetings in the format of a circle, and then the formal setting of a conference.

Figure 5

The Restorative Practices Continuum



Note. From “*Restorative circles in schools: A practical guide for educators*,” by B. Costello, J. Wachtel, & T. Wachtel, 2019, International Institute for Restorative Practices, p. 12. Copyright 2019.

Students can also be encouraged to use RPs outside of the classroom when they handle social or emotional situations on their own. For example, RPs such as mindfulness can be practiced in the classroom or outside the classroom whenever there are feelings of frustration or concern. The problem solving skills that students learn in collaborative settings inside the classroom, during RP circles, can be used in situations with students from other classes as well. This would provide students with the opportunity to grow their social skills and emotional skills with other students and staff in a variety of school settings.

Implementing RPs that impact social and emotional growth towards students directly comes from the teacher and with a mindset of support. Interviews with teachers from Gregory et al. (2021) revealed that

professional development was a way in which teachers were able to practice using RPs in the same way they would in the classroom. Themes such as team building and feelings of honesty emerged during this RP time. Furthermore, principals from this study expressed awareness of providing support to teachers who just entered the profession (Gregory et al., 2021). Continuing professional development for teachers with support and guidance would also continue the implementation of RPs in the classroom to help students with social and emotional skills.

Policy Implications

With the awareness of the impact of RPs and the various types of strategies, there are policy adjustments and additions that can be made to strengthen the knowledge and use of RPs. According to the school policies that mention or describe RPs in school districts across the states, they are either placed within school discipline policies or code of conduct (Parents Defending Education, 2024). Since studies have shown that there are behavioral concerns when it comes to addressing RPs that align with social and emotional growth, policies should continue to place RPs with discipline policies (Costello et al., 2019b; Kelly et al., 2023).

With that being said, these policies provide limited information and unclear distinctions between terms (Parents Defending Education, 2024). For example, there is little to no information indicating the relationship between RPs and the impact it has on social and emotional skills for elementary school districts. Providing this information would help with understanding that RPs would impact the social and emotional growth of students alongside behavioral concerns. Moreover, the terms restorative justice and RPs are used interchangeably within these policies. Providing definitions of RPs and restorative justice would give parents and educators a clear understanding of these terms and how they are perceived and used in the classroom.

Directions for Future Study

With the current data on specific types of RPs and how they are used in the classroom, there is a limited amount of recent research. Implementation of RPs for elementary school students specifically only measured growth from one year to a maximum of two years. Collecting data past two years and beyond of RP implementation would provide additional data on how RPs impact elementary school students socially and emotionally. Growth can be further measured and compared year by year for each student in these studies.

Moreover, as schools continue to adapt RP in their schools to help students socially and emotionally, additional research on these specific types of RPs could help expand the knowledge on the variety of strategies that would be available for teachers to use in the classroom. In a quantitative study from Darling-Hammond et al. (2020) on restorative justice, the

researchers mentioned how there is limited research on RPs. While there was qualitative and quantitative data from each grade level, there was limited information from elementary school students especially in the lower grades. This could be due to the nature of how data is collected and limitations on how data could be collected from this age group. Further research on RPs and its impact on different grade levels would allow for a deeper understanding of how RPs affect younger students.

Summary

The goal of this project was in response to the increase of social and emotional distress in elementary school students, the utilization of RP in the classroom has increased. As a result, schools decided to use RPs rather than primarily using punitive disciplinary actions. This project aimed to explore the RPs which are used to help with the growth of social skills and emotional skills in elementary school students and to know how these two factors are measured. These ideas align with the idea that students learn from observing the RP focused on building emotional and social skills (Social Cognitive Theory) and students work together as a community (CoP) using RPs to address situations that arise at which build on their social and emotional skills.

Findings showed that affective language and meetings that foster collaboration are RPs that focus on social growth. Affective language starts from the teacher and knowing when it is appropriate to address situations in public and private settings. Community building circles, such as morning meetings and setting expectations and norms, are the types of RPs that establish social skills. Additionally, setting social expectations from the beginning of the year and intentionally practicing them throughout the year in collaborative settings is encouraged. For RPs that focus on emotional growth, there are proactive and responsive approaches in addition to mindfulness. The process of checking in and checking out is one of the proactive approaches and responsive approaches are RPs that take place after an incident. Moreover, the way the growth of RPs are measured are shown through student interviews and surveys, teacher interviews and observations, and insights from principals and parents. The impact of social and emotional growth for elementary school students is seen with the use of RPs.

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An Exploration of the Impact of Teacher-Student Relationships on the Self-Efficacy of Elementary-Aged Students

Arianna Elizabeth Koski

Abstract

This research investigated the interaction between positive teacher-student relationships and the impact this has on student self-efficacy. Given that low self-efficacy negatively affects student learning, it was crucial to explore how fostering positive teacher-student relationships could mitigate this outcome. Self-efficacy refers to a student's belief in their capability to succeed when given a specific task. This self-belief is important in how students approach learning and respond to challenges. Low self-efficacy can be linked to poor academic performance and externalizing behavior in students. Therefore, it is critical to understand the factors that can enhance student self-efficacy so that the learning environment can be improved for all students. The research synthesized findings from previous studies that explored the effects of teacher-student relationships and students' self-efficacy on various aspects of academic success, gender, behavior, and decision-making. These studies consistently highlighted the profound influence that teachers can have on their student's self-belief and confidence. Students with high self-efficacy tend to perform better academically and are more likely to persist when facing challenges. Conversely, negative teacher-student relationships have serious negative implications for student behavior and academic performance. Students who have conflictual relationships with their teachers are more likely to be disengaged and exhibit strong externalizing behavior. Students with high self-efficacy are more confident in their decision-making and are more likely to make career decisions that are closely aligned with their interests and goals. In general, this research acknowledges the importance of positive teacher-student relationships and underscores self-efficacy as a key factor in the overall success of students. By creating an environment where students feel valued and capable, teachers can help students build the self-efficacy they need to be successful in their academic and personal pursuits.

Chapter 1: Introduction to the Project

Background

Human connection is a shared experience that enriches our interactions with others. It is through these where humans find joy and fulfillment, fostering a sense of belonging and enhancing our overall well-being. Similarly, relationships within education have been shown to enhance the learning

experience for students, improving academic performance (McKinnon & Blair, 2019) and fostering social-emotional growth, such as increased self-efficacy (Jederlund & Rosen, 2023). Self-efficacy is the measure of how competent and confident one feels in their ability to articulate a given task. This is important because it can influence humans' view and perception of themselves and can alter their approach to learning. These interactions between teacher and student can leave profound impacts on students. Specifically, school-aged children who are early in their development. During these primary years, children's cognitive abilities are growing rapidly and are susceptible to large amounts of change (Dai et al., 2019). Similarly, these neural connections have been linked to growing in strength when supported by close familiar relationships. More specifically, when young children have close bonds with maternal and maternal-like figures, these relationships result in higher cognitive development in young children. (Shin et al., 2019). Similarly, these neural pathways are integral to building new connections and serve as reminders for how cognitive development is crucial to learning.

Likewise, positive teacher-student relationships have largely contributed to what it means to be a successful student today. Positive teacher-student relationships can be defined as connections between teachers and students that allow students to feel welcomed and accepted by their teacher. Moreover these relationships are low in conflict, and do not leave the student too dependent on their teacher. There is a level of trust between the teacher and student, and the teacher creates a level of rapport in which the student feels that they can learn without judgment by the teacher. Similarly, self-efficacy can be defined as the perception of one's own competence and confidence within a given area. In this case, student self-efficacy would be the students' belief in their ability to perform well within various tasks. Furthermore, research suggests that self-efficacy is the foundation for developing the social-emotional skills required for higher-order thinking and contributes to learning success (Cantor et al., 2019). Hence, these attributes can positively impact how a student learns and can lead to positive academic outcomes. That is why it is important to further dissect this issue so that educators and teachers can be better equipped to serve their students

Statement of the Problem

Self-efficacy is not just how confident a student feels about their academic capabilities, but also their ability to navigate and cope with adversity (Widowati et al., 2023). Therefore, if students show signs of low self-efficacy, then this becomes an indicator of how well they perform academically. If low self-efficacy is not addressed, then students are left unequipped to handle the challenges that are presented to them in their early years of schooling. Not addressing deficiencies in self-efficacy can also lead to an increase in student burnout and a lack of motivation. Previous studies have shown that

a lack of self-efficacy is strongly associated with student burnout, which directly impacts students' ability to perform and persevere through academic adversity (Ma, 2024). Likewise, math self-efficacy can also be linked to math outcomes and is seen as a predictor for math success. When students are less confident in their math ability, they are more likely to perform poorly on assessments (Lee, 2022). These findings suggest that if low self-efficacy is not addressed, then there are serious negative implications for students. Further magnifying the urgency to explore how positive teacher-student relationships can impact student self-efficacy. Previous research on self-efficacy reveals the implications of not acknowledging the influence of self-efficacy. Therefore, it is important to identify ways in which self-efficacy can be enhanced, because if it is not, then there are serious repercussions on student mindset, motivation, and academic achievement (Lee, 2024; Ma, 2024; Widowati et al., 2023).

Purpose of the Project

The purpose of this research is to further inspect how positive teacher-student relationships impact the self-efficacy of children in elementary school. Since students spend a lot of time at school it is important to look at how teachers optimize the time they have with students. Moreover, what steps are teachers taking to ensure that students are performing at their highest potential? Self-efficacy provides students with the confidence they need to feel competent in their studies. Therefore, it is crucial to understand how teachers directly impact this and what strategies they can use to promote self-efficacy in young students. This research aims to explore the ways in which positive teacher-student relationships influence student self-efficacy and the implications of these findings. Neglecting to explore these inquiries can have serious negative implications on students' academic performance, mental resilience, and perceived competence in their studies (Lee, 2024; Ma, 2024; Widowati et al., 2023). At the foundation of teaching, is the singular objective to assist in educating and progressing students to be the best they can be. Hence, making it imperative to further investigate any methods that aid teachers in being able to do just that, solidifying the purpose of the study and the need to explore this further.

Theoretical Framework of the Project

Self-efficacy was initially introduced by Albert Bandura, which claims that the ability for an individual to feel competent in each task, comes from their own self-belief. Moreover, the idea that what one believes they are capable of, is indication of how successful one will be in a given assignment (Bandura, 1977). Bandura initially studied this through various animal and human trials, where the experimental groups were given additional training. In return, the participants were more likely to feel confident in their execu-

tion of the task presented to them by the researchers (Bandura, 1977). Bandura's self-efficacy theory came as an opposition to the formal learning theory that posits that learning is acquired through conscious effort (Kimberley & Osmond, 2011). Instead, Bandura argues that there are internal motivators that can increase the effort and motivation to accomplish any task. Bandura's self-efficacy theory became a cornerstone for analyzing behavior, extending its relevance beyond a single mode of learning.

Bandura's self-efficacy theory was later expanded to further exploring the qualities of academic self-efficacy. Bandura argues that academic self-efficacy can be multidimensional and can change depending on the academic subject and is shown to be connected to motivation in learning (Bandura, 1995). Bandura's research showed that students with high self-efficacy rated themselves higher in mental effort when faced with challenging academic tasks (Bandura, 2006). Other studies also revealed how college students who rated themselves as high ability were more likely to have high test scores a year after the initial rating (Bandura, 2006). While another study displayed how perceived high self-efficacy in high school students was positively related to high math aptitude and overall academic achievement (Bandura, 1995).

Bandura's later studies also examined the impact of self-efficacy on academic achievement through multiple means of representation. Meaning, Bandura sought to examine how different teaching mediums influence the perceived self-efficacy of school-aged students. Bandura found that when low achieving students were displayed with an adult model of a mathematical procedure, whilst receiving a verbal explanation, these students rated higher self-efficacy than students who were lectured on the subject (Bandura, 1995). Which illuminates the idea that some students may be more apt to comprehend the given material when it is presented in a way that visually and auditorily registers to them. Further revealing the multidimensional factors involved in self-efficacy and what influences this concept.

Bandura argues that self-efficacy derives from a place of control and agency over one's life. Meaning that as humans have progressed and developed overtime, and the more knowledge that is expelled, the more humans desire to seek autonomy over their thoughts (Bandura, 1997). This idea then becomes the foundation for Bandura's self-efficacy theory. Although this revelation came after many years studying this concept, Bandura was able to identify the root of this theory. Bandura argues that one's environment heavily influences their ability to exercise control over their self-belief. For instance, social systems shape how a person responds to different situations. He further explores how this ability can be used for both positive and negative purposes, emphasizing the substantial role of perceived self-efficacy in influencing one's actions. Perceived self-efficacy has the power to predict

how much time, effort, and patience an individual will put into something (Bandura, 1997). Self-efficacy can also predict how likely someone is to experience setbacks or inhibit themselves from fully realizing their potential (Bandura, 1997). Bandura argues that self-efficacy is not just a matter of how well one feels about their ability to perform, but also how they view themselves within their society and how likely one is to explore the opportunities around them (Bandura, 1997). Perceived self-efficacy can become very powerful, in that it can motivate an individual to progress, or it can hinder one's ability to even try. The human brain tries to rationalize the events that an individual experiences, and depending on how the brain perceives a given experience it can radically shape one's self-efficacy. Which in return, drastically shifts the mental fortitude and cognitive agency that is required to develop one's self-efficacy (Bandura, 1997).

Given the research question, it is crucial to recognize the role of self-efficacy when examining the impact of positive teacher-student relationships on students' self-efficacy. According to Bandura's self-efficacy theory, enhancing a student's self-efficacy improves their ability to perform well on tasks, offering valuable insights into the factors that contribute to student achievement. Understanding how to boost self-efficacy is essential for educators, as academic growth and success are foundational to the education system. Therefore, identifying strategies and patterns that lead to these successful outcomes is of the utmost importance, and further amplifies the significance of how positive teacher-student relationships impacts students.

Definition of Key Terms

To better elaborate on this topic, it is important to note these key terms.

Externalizing behavior: hyperactive, impulsive and aggressive behaviors (Hendrickx et al., 2022).

Self-efficacy: "the beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p.3).

Positive teacher-student relationships: high levels of closeness and low levels of conflict (Ansari et al., 2020). Similarly, positive teacher-student relationships can also be characterized as the praise and acknowledgement given from teacher to student, and the high level of rapport that is developed. Elementary aged children refer to children in kindergarten through fifth grade.

Summary

Relationships and the ability to feel connected is a human quality that will always be integral to the advancement of any society. The feeling of connectedness transcends through generations, cultures, and gender. Without

relationships humans are remiss of the joy that comes from knowing one another. Similarly, this connectedness is of significant value to the cognitive development of young children, and to the advancement of their academic learning. These attachments can produce positive results when considered carefully. The impact of positive teacher-student relationships has been shown to promote self-efficacy in young students. This self-efficacy then becomes the catalyst for how young students perceive their ability to learn and predicts how they will approach their learning in the future.

Self-efficacy is the capacity for an individual to feel competent in each task or activity. Likewise, it also pertains to one's motivation and ability to navigate adversity (Widowati et al., 2023). Therefore, low self-efficacy then hinders one's ability to adapt and overcome challenges when performing a task, and in education can be a predictor for low academic achievement (Lee, 2022). Therefore, it is important to further study these relationships, because if not then students are at a disadvantage of performing at their highest ability. Therefore, the purpose of this paper is to further explore this topic so that teachers can present studies with the means to be the best they can be, and to equip them with the strategies to grow in areas of their cognitive and academic development.

Bandura's self-efficacy theory helps to expand on this concept by enlightening on the idea that one's ability to perform well on a given assignment derives from how confident and competent one feels. This translates into learning by expanding on novelty concepts that learning is linear. The self-efficacy theory broadens that by illuminating on the impact one's confidence and mental fortitude has on their development. According to Bandura this confidence can be influenced by one's environment and can grow in accordance with the agency one has in their surroundings (Bandura, 1995). Further magnifying the significance of the research topic at hand and how positive teacher-student relationships may affect this.

The next chapter will provide a comprehensive exploration of Bandura's self-efficacy theory, delving into how this theoretical framework interconnects with the findings from the present studies. The research will examine how self-efficacy influences various aspects of students learning and academic performance, and how these insights deepen the understanding of the factors that contribute to academic success. In the following chapter, practical and legislative implications will be discussed in response to the key findings.

Chapter 2: Review of Related Literature

Introduction

The purpose of this research is to delve deeper into the implications surrounding positive teacher-student relationships and the impact they may have on student's self-efficacy. Self-efficacy is the measure of how competent

and confident an individual feels in their ability to perform a task. This cognitive understanding comes from Bandura's self-efficacy theory which posits that an individual's capacity to perform well on a task is aligned with their own self-belief (Bandura, 1977). Bandura's research is the result of years of studying how neural connections are formed, and it has inspired numerous research studies. This research will continue to explore these implications further through the lens of Bandura's self-efficacy theory and how this relates to education.

This chapter will explore the relationship between positive teacher-student relationships and student self-efficacy and how this may affect students' academic success, behavior, and self-efficacy. These categories serve to deepen the understanding of the research problem and to examine how they relate to one another. This research aims to understand how positive teacher-student relationships influence student self-efficacy and how this relationship extends into various aspects of a student's life. Examining this interaction is crucial, as a lack of thorough exploration can leave students at a disadvantage, potentially undermining their self-efficacy and overall success. (Lee, 2024; Ma, 2024; Widowati et al., 2023). Therefore, it is imperative to investigate the extent to which positive teacher-students relationships impact self-efficacy and how to develop effective strategies that support student growth and achievement.

Academic Success

The focus of the education system has always been to educate and inform students. Academic achievement has always been a barometer for student learning and is a suggested tell sign of how effective one is at teaching. Therefore, it is important to delve deeper into this idea by focusing on how exactly a student reaches that point of high academic achievement, and what influence self-efficacy may have on this.

Self-Efficacy and Math Achievement

Math anxiety is a significant barrier that impacts many students and plays a crucial role in their math performance (Tarkar et al. 2022). Research by Tarkar et al. (2022) explored this issue by analyzing existing data from third and fourth grade classes, utilizing math data generated from a semester-long online math program. This program offered students the flexibility to choose which math concepts to work on and incorporated various tasks aimed at enhancing their mathematical understanding. Additionally, the program included surveys at the end of each math activity, prompting students to self-rate their math anxiety and self-efficacy. The results of these surveys were then correlated with traditional math assessments, providing a comprehensive view of how math anxiety and self-efficacy interact with math achievement.

This approach highlights the complexity of math anxiety and its mul-

tifaceted impact on students learning experiences. By synthesizing the data from both self-assessments and objective performance metrics, the study underscores the importance of addressing emotional and psychological factors in educational settings to foster better math outcomes. Such insights are essential for developing targeted interventions that can alleviate math anxiety and bolster students' confidence and performance in mathematics.

After analyzing this data, the results showed that boys typically scored themselves lower on math anxiety than girls and performed higher on math fluency (Tarkar et al., 2022). However, there were no self-efficacy discrepancies regarding gender according to the researcher's data. However, results also showed that students with high anxiety and high self-efficacy scored better than students who rated themselves as having high anxiety and low self-efficacy (Tarkar et al., 2022). Demonstrating how significant the level of self-efficacy is on one's ability to perform well on a math assignment. This reflects Bandura's argument that if one can diminish one's fears, or at least inhibit them in some capacity, then this can increase one's ability to produce feelings of competency in each subject (Bandura, 1977). The study by Tarkar et al. (2022) suggests that self-efficacy may mitigate the negative effects of math anxiety, enabling students to perform well academically on their math assessments despite their anxiety. This emphasizes the value of self-efficacy, demonstrating that even when facing mental obstacles, students who perceive themselves as confident and competent in math are more likely to succeed despite experiencing math anxiety.

This trend is also evident in the study conducted by Lee, Lee, and Bong which examined the interplay between self-efficacy, growth mindset, and perceived math gender stereotypes. Lee et al. (2022) assert that analyzing existing literature and data highlights the intricate relationship between these attributes. Their findings suggest that when students with low math abilities are given an opportunity to practice mastery of a given skill, watch their peers succeed at a task, or receive verbal encouragement for their work, they are more likely to feel empowered (Lee et al., 2022). Which embodies Bandura's theory on self-efficacy that argues that through these different experiences, one's own self-belief will be enhanced and that these various experiences are what shape the self-efficacy of an individual (Bandura, 1977). This research reveals how influential this can be on the perseverance and mindset of a student with low proficiency in math.

Teacher-Student Relationships and Gender

In response to the present research, it is of value to investigate how teacher-student relationships may have an impact on gender, or how it affects the dynamic of these two qualities when present together. In a longitudinal study, researchers Arens and Niepel (2019) studied students from kindergarten to third and fourth grade and analyzed how school attitudes and perceived teacher acceptance changed over the years and the gender differenced

within these associations. The researchers used a questionnaire to measure the students' school attitudes and how they rated themselves on teacher acceptance.

The results showed that students' school attitudes and perceived teacher acceptance declined as the study progressed, along with the student academic motivation. However, the researchers did not find any gender differences (Arens & Niepel, 2019). The researchers suggest that this decline could continue into secondary school and beyond (Arens & Niepel, 2019). Results also showed that a high perception of teacher acceptance was a determinant of school attitudes and that these two traits were highly related in this study (Arens & Niepel, 2019). While other research suggests that gender does influence the attention given to students. Girls who are more withdrawn are less likely to receive attention from their teacher due to their avoidant behavior (Chaudhuri et al., 2024). Which decreases the level of closeness between teacher and student. Teacher-student closeness and conflict are also predictors of student engagement, students who view their teacher as an adversary are less likely to follow teacher directions (Kang et al., 2023).

These findings are very revealing in that they demonstrate the importance of the teacher-student relationship dynamic and the impact it can have on a student's outlook on school. School attitude can be described as one's liking and admiration for school, both of which are suggested to have positive associations for a student (Arens & Niepel, 2019). Likewise, Bandura's self-efficacy theory also suggests that when there is an increase in perceived self-efficacy there will also be a change in one's approach behavior (Bandura, 1977). The articulation of how one approaches a situation is closely related to their self-efficacy. In the same way, Arens and Niepels (2019) reveals how students' school attitudes were related to their perception of teacher acceptance, and these school attitudes were also indicators of higher school performance. Illuminating the idea that positive teacher-students' relationships can have an impact on school attitudes, which in turn could later become an indicator for self-efficacy. Although no gender differences were discovered in Aren & Niepels (2019) study, it provided insightful information on how positive teacher-student relationships are valuable regardless of gender, and how these perceived relationships can alter the progress of a student's outlook on school.

Reading Development

Literacy skills are foundational to the development of any student and is necessary for all students to be successful. Therefore, it is imperative to identify key factors that may aide and assist in the development of these skills. Varghese et al. (2019) analyzed the literacy development and teacher-child relationships among 503 kindergarten and first-grade students and their teacher, to determine if there was an association between the two. The results showed that when teachers reported high conflictual relationships

with students in the fall, those students' literacy skills were more likely to be lower in the spring. Teachers with higher efficacy can also positively impact student literacy development in that teachers who have strong classroom management skills create opportunities for students to feel safe learning new skills (Varghese et al., 2016). Furthermore, teacher-student relationships that are consist of emotional support can also enhance young students' literacy development, and can deter challenging behaviors (Bulotsky Shearer et al., 2020).

These findings are astounding because they highlight on the impact that negative teacher-child relationships can have on a student's literacy development. Although the researchers did not find statistical significance for the closeness of teacher-child relationships to literacy skills, they did find an association when students have negative teacher interactions. Further, it illustrates how conflict and negative adversity can diminish the ability of young child to grow cognitively in their literacy skills. This relates back to Bandura's self-efficacy theory when Bandura mentions the role of verbal persuasion. Verbal persuasion refers to the comments made by others that help influence and increase the efficacy one has in one's ability to perform well at a given task. The study demonstrates the negative impact of a lack of positive verbal persuasion. Varghese et al. (2019) highlighted the detrimental effects of negative teacher-child relationship on young children's literacy development. Providing more support for Bandura's self-efficacy theory because it suggests what can occur when verbal persuasion is not used to benefit the student's ability to feel confident in their literacy skills.

Overall, academic achievement is an essential part of the academic experience for all students regardless of their demographic. The education system exists to educate and inform the youth, and further investigating how these outcomes can improve is of great value to the system the exists today and in the future. The given literature in the section have provide valuable insight as to how and why positive teacher-student relationships and self-efficacy are important parts in cultivating academic success in students.

Regarding math performance scores, students who rated themselves as high math anxiety, and high self-efficacy, were more likely to perform well on a math assessment (Tarkar et al, 2022). Emphasizing Bandura's argument that when one feels confident in their command of a given subject, then they are more likely to perform better (Bandura, 1977), reiterating how powerful self-efficacy can be. Furthermore, while Arens & Niepel (2019), did not find statistical significance for gender having an influence on school attitude or rated teacher closeness, they did find a relationship between rated teacher closeness and school outlook (Arens & Niepel, 2019). Meaning that students who felt stronger connections to their teachers were more likely to have a more positive outlook on school. This positive mindset can then potentially translate to more confidence and competence in their ability to approach school, increasing one's self-efficacy (Bandura, 1977).

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Student Behavior

Student behavior has become an integral part of teaching today. Recent studies show that student behavior has become a key determinant in the success of teachers, as well as their motivation to keep teaching (Berry et al., 2022). Many teachers today who have left the profession, claim that student behavior was a main reason for making the decision to leave, and k-12 education was rated as the profession with the highest burnout (Agrawal, 2022). Therefore, it is of great value to look further into what factors can decrease the likelihood of this happening and examine ways to make the school environment a more enjoyable place for educators and students.

Teacher-Student Relationships and Classroom Behavior

Given the increase in teacher burnout in contemporary classrooms, it is vital to investigate the variables that contribute to this phenomenon (Agrawal, 2022). Moreover, the daily activities and the dynamics in the classroom that contribute to these issues, and what can be done to resolve teacher burnout. Hendrickx et al. (2022), conducted a study where 57 fifth grade classes using questionnaires and observations to examine the impact of teacher-student relationships on externalizing student behavior. Externalizing behavior includes outburst, explicit reactions, and physical actions. The study found that boys were more likely to be rated by peers as having higher rates of externalizing behavior and to have more conflicted relationships with teachers. Teachers tended to be harsher with students exhibiting higher externalizing behavior, which led to an increase in such behavior (Hendrickx et al., 2022). Other studies, such as Metin Aslan & Boz (2022), suggest that high-conflict teacher-student relationships cause stress among students, leading to increased disruptive and disengaged behavior. Roorda & Koomen (2021) indicate that teacher-student closeness can be an indicator of externalizing behavior, which then affects the quality of learning for students in primary and secondary grades.

These findings are revealing because it demonstrates the repercus

sions of having poor teacher-student relationships. While the researchers did not find statistical significance for increased teacher-student relationships diminishing externalizing behavior, it does show support for what can happen when there are high conflict relationships between teacher and student. These high conflict relationships can then evolve into increased externalizing behavior, allowing for more friction within the classroom (Hendrickx et al., 2022). Moreover, the researchers discussed how decreasing conflict could be more powerful than increasing teacher support when it comes to decreasing the overall externalizing behavior of students. Which reflects Bandura's self-efficacy theory because Bandura argued that stressful life circumstances and adverse life transitions can impede on one's ability to develop a sense of self-belief (Bandura, 1995). Similarly, these negative life experiences can also induce stress and anxiety which may also leave an individual vulnerable and susceptible to overthinking, which all can decrease one's ability to feel confident in mastering an activity (Bandura, 1995). Therefore, in Hendrickx et al. (2022) study, the results showed that an increase in conflictual relationships decreased student's self-efficacy and Bandura's theory supports that in discussing how stressful life circumstances can impact one's ability to feel competent in their studies. Further magnifying the importance of decreasing negative teacher-student relationships in support of increasing self-efficacy.

Teacher-Student Relationships and Delinquent Behavior

Student behavior is not limited to inside the classroom but expands throughout their everyday choices. The type of decisions that are made inside the classroom are likely to reflect the decisions that are made outside the classroom. Therefore, it is of value to examine how teacher-student relationships may have an impact on student behavior overtime, and how this influences their decision making. Moreover, do positive teacher-student relationships leave students with an increased ethical moral compass, and if so, how does this influence student behavior.

In a longitudinal study done by Obsuth et al. (2023) students' delinquent behavior was monitored from the ages of 7 to 17 using a surveys and questionnaires. The results showed that students who self-rated as having a better relationship with their teacher at age 10 were less likely to engage in delinquent behavior at ages 13, 15, and 17 (Obsuth et al., 2023). Similarly, students who self-rated as having high quality teacher-student relationships at age 10, were less likely to show signs of aggression at age 17 (Obsuth et al., 2023). In comparison, student's self-efficacy increases when they are given positive feedback from their teacher, which then decreased the likelihood of students participating in academic cheating (Zhao et al., 2024). Children who are in groups with students who have low teacher-student relationships are also more likely to exhibit externalizing behavior due to their close association to these students (O'Connor et al., 2011). All of which highlights how teacher-student relationships are contributors to students' behavior and how this impacts

students school experience.

These findings are significant in that they reveal how students who experience higher closeness with their teachers at age 10 are more less likely to participate in delinquent or violent activities. Further explaining how influential teacher-student relationships are on young students, their behavior, and the longevity of their ethical decision making. These findings also relate to Bandura's theory in that Bandura argued that children that had coercive and intrusive relationships with their mothers were more likely to have higher self-efficacy for aggression, in that aggression became the natural response in peer relationships (Bandura, 1995). Although in this study the researchers are identifying teacher-student relationships, non-parental relationships with students have been shown to been just as influential as paternal relationships (Shin et al., 2019). Therefore, this study also reflects that by revealing how negative teacher-student relationships led to more delinquent behavior as the child got older, illuminating on Bandura's theory that paternal and potentially paternal like figures have an influence on children's self-efficacy and how their behavior towards life.

Self-Efficacy

Self-efficacy is the measure of how confident one feels in their ability to articulate or complete a task (Bandura, 1977). This concept originates with Bandura's self-efficacy theory which posits that one's level of success or the outcome of an event is significantly influenced by their self-belief. Moreover, if this theory holds validity, then this becomes a very powerful resource when it comes to participating in any activity or assignment. Self-efficacy then becomes the cornerstone for success and can be determining factor in how well one is at mastering a task. Therefore, it is of significant value to explore this further a identify how this may pertain to education, and the way in which students learn.

Bandura's Self-Efficacy Theory

The idea that one's self-belief has the capacity to alter the rate of success for a given exercise, is a theory that revolutionized the way learning was viewed. Bandura's self-efficacy theory can as an alternate idea to the formal learning theory which suggests that through conscious effort one can learn anything (Kimberley & Osmond, 2011). The formal learning theory however neglects to consider the cognitive differences and nuances between individuals. Moreover, it assumes that every individual has an equal ability at mastering an objective, however not everyone learns at the same pace. That is why Bandura's self-efficacy theory helps to bridge that gap by explaining what neural processes may take place when an individual approaches learning a new skill.

Bandura's self-efficacy theory argues that performance accomplishments, vicarious experiences, verbal persuasion, and physiological states are

the four primary components that determine the measure of one's self-efficacy (Bandura, 1977). Performance accomplishments refer to the current state of mastery experiences, meaning if an individual has repeated success or minimal mishaps in each experience, then they are likely to have higher self-efficacy (Ahn et al., 2017; Bandura, 1977). This then can translate when participating in new experiences, if one's self-efficacy is high then the individual is more apt to feel confident when trying new activities where they have little experience. Bandura refers to vicarious experience as the act of one individual observing another be successful at the same assignment that they have been assigned to (Ahn et al., 2017; Bandura, 1977). Moreover, this may look like providing a model of what the outcome should look like, allowing the student to raise their self-efficacy without facing any risks. Verbal persuasion is the act of suggestion given to from one individual to another, to encourage and increase the rate of success for the individual who is completing the task (Bandura, 1977). Verbal persuasion can be powerful because it is easily accessible and can be utilized without other resources. Lastly, Bandura argued that the barometer of one's current physiological state can also impact their self-efficacy. Furthermore, Bandura stated that physiological states such as anxiety and vulnerability can manipulate the way in which one approaches a situation, which in return can affect their self-belief (Bandura, 1977). Likewise, feelings of fear can also have a huge impact on efficacy, in that it can trigger other unwanted feelings or emotions that can negatively hinder the ability for one to cope (Bandura, 1977). Overall, Bandura argued that these four factors: performance accomplishments, vicarious experiences, verbal persuasion, and physiological states, are all major components in determining the level of efficacy that one possesses, and that the varying degrees of each one can either hinder or increase these results (Ahn et al., 2017; Bandura, 1977).

Self-Efficacy and Personal Development

When considering the magnitude of self-efficacy and its implications, it is important to note how self-efficacy may affect one's personal development. Self-efficacy is not a process that can be turned on in a specific situation or event, instead self-efficacy is the culmination of a variety of cognitive pathways that have been formed over time (Bandura, 1977; Cantor et al., 2019). These cognitive pathways are key to human development and to the overall mindset that one has when it comes to approaching the vast life experience that one faces. Therefore, self-efficacy is one of those cognitive processes that should be further explored regarding personal development, and how the impact of this permeates through different aspects of one's life.

In a study done by Supervía et al. (2022) data was collected on students ranging from 12-19 years of age, and the researchers were looking to identify any relationships between resilience, academic performance, and self-efficacy. Resilience is referred to as the capacity for an individual

to overcome a challenge or undergo a trial of sorts whilst being presented with adversity. The results showed that self-efficacy was closely related to resilience and academic performance, in that self-efficacy bridges the relationship between resilience and academic performance (Supervía et al., 2022). Moreover, positive teacher-student relationships can increase students' self-belief in goal setting and can improve their task initiation (Jederlund & Rosen, 2023).

These findings are significant because it magnifies the influence that self-efficacy has, in that it can alter the resilience and academic performance of an individual. Moreover, resilience is a human quality that can positively alter the way one views life and is a valuable trait that can be carried throughout life. Therefore, it is of great value to acknowledge the role that self-efficacy plays in boosting resilience and how these two are connected. Bandura's self-efficacy theory also acknowledges this when physiological states are mentioned as influencing self-efficacy and how fear can hinder the mental fortitude that is exerted into a given exercise (Bandura, 1977). Illuminating on the idea that a strong mindset, such as one that possess resiliency, can significantly impact the way in which an individual accesses information. This research further supports Bandura's theory that physiological states influence self-efficacy, demonstrating how self-efficacy mediates resiliency and academic success.

Self-Efficacy and Career Exploration in College Students

This research investigates the relationship between teacher-student interactions and their impact on school-aged children's self-efficacy. Additionally, it is valuable to identify how self-efficacy may affect individuals beyond their primary years. Therefore, this section further examines how self-efficacy impacts students of a more mature age and how this may influence their decision-making. Moreover, how does self-efficacy evolve throughout one's life, and does it influence their life decision making?

Researchers Jia and Wang (2024) studied how self-efficacy, life satisfaction, perceived social support, and career exploration impacted one another, or if there is a relationship between these four factors (Jia & Wang, 2024). To do this they surveyed 992 college students from three different universities, where they used multiple scales to measure their self-efficacy, life satisfaction, perceived social support, and career exploration. The results showed that "Self-efficacy and life satisfaction independently and jointly mediated the relationship between perceived social support and career exploration. In other words, self-efficacy and life satisfaction played a chain-mediating role between perceived social support and career exploration" (Jia & Wang, p.7, 2024). Revealing how interconnected these four factors are.

These findings suggest that self-efficacy can influence one's life in more ways than just inside the classroom; it can also influence one's ability to navigate life decisions such as choosing a career. Moreover, these findings

only further magnify the importance of self-efficacy and how powerful it is. Previous research shows how self-efficacy can influence academic achievement, behavior, and now career exploration (Agrawal, 2022; Arens & Niepel, 2019; Hendrickx et al., 2022; Jia & Wang, 2024; Tarkar et al., 2022). This underscores the powerful influence of self-efficacy on an individual's overall approach to life and their perception of it. Furthermore, the findings of Jia & Wang also illuminate how life satisfaction and self-efficacy are related and how these two may play a role in how explorative one is in finding a career that best suits them. Moreover, an increase in self-efficacy and life satisfaction led to more effective career exploration (Jia & Wang, 2024), demonstrating how valuable self-efficacy is in making these life decisions. Bandura argued that self-efficacy would not only strongly guide someone in their career decisions but also predict how aligned these decisions are to one's interests, and beliefs (Bandura, 1995). Moreover, the present study supports this theory in that it shows how life satisfaction and self-efficacy are highly related to one's ability to find a career that best fit them (Jia & Wang, 2024).

Summary

The research discussed has shown how self-efficacy and positive teacher-student relationships have been shown to heavily influence student academic success, student behavior, and their self-belief throughout life (Agrawal, 2022; Arens & Niepel, 2019; Hendrickx et al., 2022; Jia & Wang, 2024; Tarkar et al., 2022). Therefore, there is value in identifying ways to increase the likelihood of this happening in the classroom because of the positive influence it has on children. Moreover, these findings reveal how diverse positive teacher-student relationships have on student self-efficacy in that its influence expands beyond one category.

For instance, student academic achievement can be improved when students are more confident in their ability to perform well on an assignment. In the study done by Tarkar et al., the findings suggest that despite students rating themselves high on math anxiety, if they rated their perceived self-efficacy as being high, they still performed well on the math assessment (Tarkar et al., 2022). Similarly, in study done by Lee et al., similar findings were produced in that when students had the opportunity to practice mastery of a certain skill, watch their peers succeed, or were given verbal encouragement on a math task, were more likely to feel empowered, allowing them to succeed (Lee et al., 2022). Both studies demonstrate the power in self-efficacy and the strength it has against internal opposition

Furthermore, the longitudinal study done by Arens & Niepel, reflect how perceived teacher acceptance can impact a student's outlook on school. Moreover, the findings of this study showed that students perceived teacher acceptance was highly related to their school attitude, and that this school attitude then became an indicator for their academic performance (Arens & Niepel, 2019). Students who experienced higher teacher acceptance were

more likely to do well in school, further emphasizing how positive teacher-student relationships can positively influence the outlook and academic achievement of a student.

On the other hand, the Varghese et al., study demonstrated how high conflictual teacher-student relationships had a negative impact on early reading development (Varghese et al., 2019). While, the researchers did not find statistical significance for increased teacher-student relationships leading to improved literacy development, they did find support for negative teacher-student relationships having a negative impact on young students' literacy development. Which is still significant because it illuminates on how poor morale between the teacher and student can have negative implications on a student's literacy skills. Further revealing how teacher-student relationships can impact academic success whether it be a positive or negative influence.

Moreover, student behavior has also been shown to be impacted by teacher-student relationships and self-efficacy. In Hendrickx et al. (2022), study the researchers found support for higher conflictual relationships with teachers, leading to higher externalizing behavior in male students (Hendrickx et al., 2022). Likewise, the research showed that teachers working with students that exhibited high externalizing behavior were also likely to be harsher on these students, leading to an increase of externalizing behavior from these students (Hendrickx et al., 2022). Revealing how negative relationships and poor morale can further lead to issues for student. In another longitudinal study, Obsuth et al. (2023), discovered that students who rated themselves as having a high-quality teacher-student relationship at age 10, was likely to engage in less delinquent behavior at 17, and that students who rated low quality teacher-student relationships at 10 were more likely to engage in delinquent behavior at 17 (Obsuth et al., 2023). Further signifying the importance of high-quality teacher-student relationships and how these relationships can impact students for years to come.

Nonetheless, self-efficacy is another valuable trait that has been shown to improve the quality of life for students and their approach to school. Bandura argued that performance accomplishments, vicarious experiences, verbal persuasion, and physiological states are four factors that heavily influence the self-efficacy of an individual (Bandura, 1977). Moreover, the factors can be manipulated overtime, and can alter depending on the individual and other externalizing influences that are present. For instance, self-efficacy can also impact personal development, and this is supported in a study done by Supervía et al., where students self-efficacy was shown to be an indicator for resilience and academic performance (Supervía et al., 2022). Indicating how impactful self-efficacy has on one's resilience, which is a powerful trait that can significantly impact one's life decisions. For example, Jia & Wang studied student life satisfaction and career exploration in college students, and they found that life satisfaction was highly related to self-efficacy (Jia & Wang, 2024). The combination of these two traits then led to an increase in career exploration and

career decisions that were more aligned with one's interests and values.

Overall, substantial evidence supports the significant influence of teacher-student relationships and self-efficacy on the trajectory of a student's academic journey and their outlook on life. The present research has served to support this and to illuminate on the importance of why it needed and continues to be studied. The next chapter of this research will further elaborate on these findings by highlighting the key notes, and by expanding the material by providing practical and legislative implications, and any gaps that may be present.

Chapter 3: Implications

Introduction

Human connection is a valuable life experience that has the power to either positively or negatively influence one's outlook on life. Teachers and students spend a substantial amount of time together throughout the school year, and it is during this time that teachers can build and develop strong relationships with their students. Therefore, it is essential to explore how teachers can optimize classroom time to enhance students' academic, social, and emotional development by the end of the school year.

Building on this idea, self-efficacy plays a critical role in a student's ability to navigate their academic journey. Self-efficacy refers to an individual's confidence and competence in their ability to perform a specific task (Bandura, 1977). Students who lack self-efficacy are in danger of not being able to navigate and overcome adversity (Widowati et al., 2023). Students with low self-efficacy are also prone to burnout and experiencing academic challenges due to a lack of motivation (Ma, 2024). Low self-efficacy in young students has also been shown to lead to a decline in math success, and students perform lower on math assessments when they lack self-belief (Lee, 2022). This further edifies how low self-efficacy can disrupt and negatively alter the learning experience for students.

Given the critical role of teacher-student relationships in educational outcomes, this research aims to investigate how positive interactions between teachers and elementary-aged students impact student self-efficacy. This research specifically explores how positive teacher-student relationships influence the self-efficacy of elementary-aged children. Since teachers spend significant time together in the classroom, it is vital to examine how this time can be managed to improve student self-efficacy and the resulting benefits. Moreover, this research dissects the factors that contribute to fostering positive relationships between teachers and students and explores how this benefits students so that they can grow confident in their autonomy as learners.

Conclusions

The aim of this research was to further investigate the connection between positive teacher-student relationships and the impact this has on student self-efficacy. The analyzed research shows support for increased student self-efficacy, which has a large influence on students' academic performance. First, increased student self-efficacy was shown to improve math scores even when facing math anxiety (Tarkar et al., 2022). This reveals how influential self-efficacy is, in that it can counter anxiety, further justifying the importance of building up student self-confidence. When students are given the opportunity to practice their math skills, shown an example, and given verbal encouragement, students are more likely to perform well on a math assessment (Lee et al., 2022). This demonstrates the power of providing students various opportunities to become accommodated to a given skill, and how this can positively influence the outcome.

Another key finding from the research is that negative teacher-student relationships have a negative impact on student academic performance and behavior. Students who demonstrated externalizing behavior were more likely to have conflictual relationships with their teachers, leading to an increase in externalizing behavior (Hendrickx et al., 2022). This is profound because it shows how negative relationships can significantly impact a student's experience at school. Similarly, students who had close relationships with their teachers were less likely to engage in delinquent and violent activities later in life (Obsuth et al., 2023). Since teachers have just as much of an impact on students as their paternal relationships, this research only gives more support to this, and how teacher-student relationships can influence the overall school experience for a child (Shin et al., 2019). This information is crucial as it offers insight into a child's potential future if externalizing behaviors and negative teacher-student relationships are not corrected. This understanding brings more purpose to what positive teacher-student relationships can do for the self-efficacy of a child, and how these relationships can foster safe learning environments for all students.

Another key finding from the research is that self-efficacy is very influential on decision-making and the overall mindset of a student. For instance, self-efficacy can be an indicator of how well an individual chooses a career. Students with high self-efficacy were more likely to choose a career that was closely aligned with their goals and interests (Jia & Wang, 2024). Revealing how high levels of self-efficacy can allow an individual to make life decisions that best suit their interests and goals. Moreover, self-efficacy can develop resilience in students, causing them to persevere through default tasks (Supervía et al., 2022). Resilience is an essential skill for growing and maturing as an individual, making it even more valuable for young students. Therefore, if self-efficacy increases resilience, then it further proves the importance of developing self-efficacy in young students and how powerful it is in shaping the lives of students.

These findings are significant because they bring further awareness as to how educators and schools can improve student learning and help develop them as well-rounded individuals overall. Improved academic performance is essential to a successful teacher and school, and increased self-efficacy in students can make strides in this area. High conflictual relationships are detrimental to the success of young students, further signifying why these types of relationships need to be exterminated. Poor teacher-student relationships can have serious consequences and do not benefit the teacher, student, or school community. Lastly, self-efficacy is a human quality that can also extend beyond the classroom into one's personal life. Through increased self-efficacy students are afforded the confidence to make life decisions that are closely aligned with their individual values and needs. These findings are key to understanding the power of teacher-student relationships and self-efficacy, and how influential this pairing is in the lives of students.

Practice Implications

The research findings underscore the influential role of self-efficacy and teacher-student relationships in enhancing overall student success. Furthermore, since the research demonstrated how negative teacher-student relationships have a negative impact on student academics and future life decisions, it is of value to consider what practice implications can help remedy these results (Hendrickx et al., 2022; Metin Aslan & Boz, 2022; Roorda & Koomen, 2021; Supervía et al., 2022). For example, teachers need to find more ways to decrease or neutralize conflict within the classroom. The research stipulates that high conflictual relationships lead to higher rates of externalizing behavior (Hendrickx et al., 2022; Metin Aslan & Boz 2022; Roorda & Koomen, 2021). Therefore, teachers need to explore the ways they can decrease or limit these occurrences in the classroom. In doing this, students are given an advantage in their education by being given the opportunity to grow in a safe learning environment.

Similarly, teachers need to prioritize getting to know students and building relationships. When students develop a high-level closeness with their teacher externalizing behavior is decreased, and students are less likely to engage in academic dishonesty (Obsuth et al., 2023; Zhao et al., 2024). Furthermore, the present research posits that positive teacher-student relationships are just as influential as paternal relationships (Shin et al., 2019). It is important for teachers to increase the amount of effort that goes into building relationships with students, and developing a classroom environment that decreases stress and fosters relationships that are beneficial to the teacher and student.

Third, it is imperative for teachers and educators to create more opportunities for students to build confidence in their ability to articulate a task. When students have more confidence in themselves, they are more likely to perform well academically, and this self-efficacy can also diminish the anxi-

ety that may come with completing assessments (Ahn et al., 2017; Bandura, 1977; Tarkar et al., 2022). Revealing the benefits of giving students the autonomy to explore and develop confidence in themselves. Similarly, developing this self-belief can be enhanced by understanding students well enough to accommodate their needs and designing lessons that suit their learning preferences. This further magnifies the importance of getting to know students, so that teachers can create opportunities that are well suited to the student, allowing them to build the confidence they need to grow academically and emotionally.

These practice implications serve to increase student success and to provide practical steps to getting there. Moreover, these practice implications are valuable to any school, and to all educators. These insights gathered from the research are current and applicable, offering benefits to teachers regardless of their experience level. These practice implications should be considered by all educators as they hold significant value for both teachers and students.

Policy Implications

The present research illuminated how negative teacher-student relationships can lead to externalizing behavior that is distracting to other students and upsetting to the classroom culture (Hendrickx et al., 2022; Metin Aslan & Boz 2022; Obsuth et al., 2023; Roorda & Koomen, 2021). Therefore, it is valuable to explore policy implications that may help resolve or limit these issues. For instance, teachers need more support when working with students who exhibit challenging behavior. Although the contemporary general education classroom has become more diverse, there needs to be greater support systems put in place to help support the level of diversity presented in the classroom. When teachers present and consistently document behavior concerns, there needs to be more aid support provided to those teachers. Furthermore, schools should have a staff member whose primary focus is to push in for behavior students, in all classrooms that require further assistance. This support should be present to all teachers and students regardless of any present individualized behavior plans (IEP) that mandate additional support. This policy implication should be separate from current systems in place, in that it does not require that a child have an IEP for a teacher to utilize this resource.

Second, schools should be required to develop a structured tier system that is specific to their school needs, that lays out a plan as to how they are going to remedy behavior issues within the classroom. This tiered system should be modeled a lot like the multi-tiered system of supports (MTSS), but should be more specific in its steps, and should be required by schools to develop a plan that best suits their needs. Through this it can be made clear to teachers and students what is expected of students, and what the repercussions are if behavioral issues are to arise. Likewise, this tiered system will make classroom

management more evident to teachers and students and will provide uniformity within the school.

Finally, school district should provide staff and students more professional development opportunities to hone their skills when it comes to managing behavior students in the classroom. This professional development would cover practical ways to get behavior students to regulate their actions in a way that is aligned and appropriate for the classroom setting. Moreover, these professional development opportunities should allow teachers to share their experiences in a way that is productive and beneficial to the system. Through this, teachers will be better equipped to serve their students and provide them with the skills to provide a safe space for all students. Moreover, the professional development should be site-specific in that it addresses behavior concerns that are relevant to the staff and is designed to meet the needs of the school. These policy implications serve to enhance the work experience for teachers and help build their confidence so that they can go and be of service to their students.

Directions for Future Study

After analyzing the research, there are certain aspects of this topic that require further investigation. One such aspect is the need to delve deeper into the influence of gender on teacher-student relationships and how this impacts their self-efficacy. The present research posits how the behavior of boys and girls differs in the classroom, and how this impacts their relationship with their teacher. However, there is a lack of research on how self-efficacy varies depending on gender and its implications. Gender studies in self-efficacy are worth studying further because they could provide further insight as to how students develop self-confidence and can unveil the nuances that are predicated by gender. Likewise, it provides an opportunity to look deeper into how children develop neurologically and investigate if there are any gender differences that influence this.

Another recommendation for future study is how teacher self-efficacy impacts the way students learn. Moreover, it is essential to examine how teachers' self-confidence influences students academically and integrates into the classroom culture. While student self-efficacy is a crucial component of student success, teacher self-efficacy significantly impacts their ability to be effective and successful for their students. This is important because if teachers have higher self-efficacy, then this could possibly provide benefits like those for young students. All of this expands the breadth of what it means to be a successful teacher, and how this, in turn can, be reflect in their teaching.

Limitations include a lack of self-efficacy in lower-elementary school-age students' self-efficacy. Much of the research centered around upper elementary-aged students. Therefore, it would be beneficial to conduct more research on how self-efficacy is present in young students. Since cognitive development is rapid within the early stages of life, it would be remiss not to

investigate how these neurological nuances manifest themselves at younger ages and how self-efficacy influences this development.

The research revealed that when student self-efficacy is increased students are more likely to perform well academically (Arens & Niepel; Lee et al., 2022; Tarkar et al., 2022; Varghese et al., 2016). Student reading development, math achievement, and student engagement were all increased when students felt confident in what they were tasked with. Likewise, positive teacher-student relationships enhanced student engagement leading to increased academic success (Kang et al., 2023). Poor teacher-student relationships lead to high externalizing behavior, which increases stress and decreases student engagement (Metin Aslan & Boz, 2022). Furthermore, self-efficacy is an indicator of how well an individual will make life decisions, such as choosing a career that is most aligned with their interests and goals (Jia & Wang, 2024). These key findings are significant because they provide insight into how students learn and the role teachers play in increasing positive outcomes for students.

Overall, this research serves to educate and inform educators and schools about the qualities that make up a safe learning environment that is beneficial for all students. Moreover, with the constant change in education, it is important to recognize attributes that will withstand time. That is why implementing positive teacher-student relationships and promoting ways to increase student self-efficacy is vital to the well-being of any school's culture. Since both of these elements have been shown to be influential, it is important to take these implications into consideration and see their worth. Through this, schools can cultivate a rich environment where students are afforded the confidence and relational support they need to be successful.

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Empowering Educators: An Exploration of the Impact of Professional Development Modalities on Teacher Practice in Secondary STEM Classrooms

Ryan McClaren

Abstract

Curriculum changes are a common and necessary occurrence in school systems. Teachers are often not adequately supported during the curriculum implementation process. Many schools have limited funds to help educators continue to hone their craft. This paper explores in-school collaboration options, traditional professional development methods, and additional unconventional options to help administrations decide which will work best for their needs and budget with particular attention paid to those teaching STEM subjects. Studies have shown that teachers should actively participate in continuous improvement used in conjunction with self-assessment. Administrators should recognize the importance of professional development and actively encourage, if not require, involvement in professional growth activities. Professional development is most effective when given adequate time, involves a long-term implementation plan, and includes teacher preference when determining which method to use.

Chapter 1: Introduction to the Project

Background

One of the main tenets of education is teaching students the importance of lifelong learning. In that same vein, educators are constantly striving to discern the best way to teach their students. But there is more to learning than the skills of the teacher. Educators should participate in continuing education to further refine their teaching practice. This need is underscored when the challenge of curriculum change is factored into the equation. Knowing the importance of professional development leads to the question – are all forms of professional development equivalent or are there types that are correlated with higher teacher success levels?

In 2016, California transitioned to the Next Generation Science Standards (NGSS). The consequences of this implementation led many schools to change or, at least, update their curriculum. Several researchers have come to the conclusion that the curriculum itself is not the center of this issue. When it comes down to it, teachers do not have the resources needed to move from one curriculum model to another (Lowell et al., 2021). Conrad et al. (2023) suggests that the issue may be far more fundamental: teachers lack the

autonomy and skill to adapt curriculum to the specific needs of their individual classrooms. Perhaps if teachers are re-trained in the skills of curriculum development, they would be better prepared to create an environment that supports a seamless curriculum transition (Conrad et al., 2023). Research into successful professional development in Science, Technology, Engineering and Math (STEM) has focused primarily on what concepts are covered in the professional development not the mode by which the material is delivered. In fact, the National Academy of Sciences published a report in 2007 that suggested that in order for America to remain prosperous in the STEM fields, teachers should participate in summer institutes, master's programs, and various other advanced educational activities. While these would without a doubt improve teacher knowledge background, they do not address the need for teachers to continually refine their practice, not to mention they are not always practical.

Statement of the Problem

Curriculum changes are necessary as standards are updated, as with the implementation of the NGSS, and there are many factors that cause frustration with implementation. As administrators adjust course to stay in line with requirements, teachers need additional professional support to successfully navigate implementation in the classroom. This leads to a slippery slope of problems: teachers confused with curriculum implementation cannot perform at their highest level which can lower student achievement which can hinder their education as they continue to progress. However, many teachers struggle to smoothly transition and implement new instructional strategies. It has been argued that “a lack of knowledge and skills make teachers appear resistant to change when, in fact, they need to be empowered with new knowledge and skills to appreciate curriculum change and pedagogical reform” (Godsend & Jita, 2021). In these difficult circumstances, the question about the most effective way to develop teacher skill sets is necessary. With the added emphasis on STEM through the education system, it follows that determining whether there are certain professional development styles that are more beneficial for teachers in these subject areas.

Purpose of the Project

Teachers need professional development to learn curriculum development skills and administrative support to achieve the administration's educational goals. Giving new curriculum to experienced teachers without support is not a beneficial solution for anyone. New educational standards require additional support and training for teachers to implement and challenge students using new pedagogical practices. The purpose of this research is to explore what methods are most effective for teachers with particular attention paid to

those within the STEM fields. Exploring what program supports and professional development has the greatest impact will help administrators focus their efforts to improve teacher practice.

Theoretical Framework of the Project

Dr. Malcolm Knowles was a pioneer in the field of andragogy - the way adults learn. He published many papers documenting his research describing how the way students are taught in schools is not the way educating adults should be handled (Knowles, 1977). Some of the tenets of his theory recognize that mature learners thrive in circumstances where there is mutual trust and respect (Knowles, 1977). Knowles also recognizes that the source of motivation is one of the outstanding differences in pedagogy as compared to andragogy. He postulates that adult learners are motivated internally by a desire to learn and grow, both as a person and professionally (Knowles, 1977). He found that adults will find a subject that interests them and continue to increase their knowledge on the subject intrinsically; essentially learners build on prior knowledge to advance understanding (Neumann & Kopcha, 2018).

There is a simplistic idea that once told what to do, teachers will be able to effectively implement the teaching strategy without any difficulty (Prennergast & Treacy, 2018). In reality, teachers' personal beliefs about learning and teaching styles directly impact the way curriculum is implemented in the classroom. Teachers are essential to the success of student learning. Many often emphasize their area of expertise, as they feel more comfortable with concepts they understand more deeply (Winarno et al., 2020). Studies have shown that curricula that include suggestions for teaching strategies are more likely to have better outcomes – for students and for teachers (Roblin et al., 2018). By implementing solid curriculum, administrators make huge strides in the success of their students. Additionally, professional development combined with new curriculum has statistically significant improvement in learning outcomes (Lynch et al., 2019).

For its many virtues, there have been some researchers that have pointed out flaws in Knowles' theories. His thoughts on self-motivation are not universal. McGrath points out that some adult learners attend continuing education simply because they are forced to do so (McGrath, 2009). There are other concerns with his theory that also need to be included. While creating a warm, safe environment is beneficial in many circumstances, it is not enough to overcome some issues for adults that struggle with low self-esteem (McGrath, 2009). Another contentious aspect of Knowles' work is that it oversimplifies the difference between traditional younger students and adults in that many adult learners have added pressures of life that can intrude on their time

and resources (McGrath, 2009). Professional development models that address both the strengths and weaknesses of adult learning have the potential to be the most successful.

Definition of Key Terms

There are many terms used generously when describing aspects of professional development. These terms will be used throughout the research to identify different standards and curriculum styles. Additionally, some of these terms are specific to the researchers who studied their use in various classrooms in multiple subjects around the world.

Discipline specific curriculum: Also called Domain Specific course model or differentiated curriculum. This style teaches one unique subject independent of other science subjects.

Mentoring: The process of an experienced teacher providing guidance and support to a less experienced teacher.

Middle school: In the context of this paper, middle school refers to grade 6 through grade 8.

Next Generation Science Standards (NGSS): Updated science education standards that are based on disciplinary core ideas, adopted by the state of California in 2013. These were followed by the 2016 Science Framework, which allows either an Integrated Course Model or Discipline Specific Model in grades 6-8.

Observation: When administrators or peer teachers observe a teacher's practice and provide feedback and encourage best practices.

Professional development: Prepares and trains teachers by introducing new teaching methods and skills to maximize curriculum in the classroom. This can be done in a variety of ways to enhance teaching practices.

Professional learning communities: Describes groups of teaching professionals that work within the same school or district that meet together to discuss specific aspects of classroom management and pedagogical methods and share expertise.

STEM: Encompasses courses under the Science, Technology, Engineering, and Math subject matters.

Student outcomes: Academic and developmental achievement of students used to determine success of teacher professional development.

Summary

As the NGSS has been implemented, administrators have a choice to make about what style of curriculum and instruction to use. Teachers are expected to change the curriculum, and there are many adjustments and supports that should be implemented to ensure a smooth transition that benefits both teachers and students. Implementing updated teaching methods for the specific curriculum can ensure teachers adopt the curriculum the way that

administrators envision. Another benefit is providing teachers the opportunity to learn additional skills to adapt curriculum to their specific classroom. By introducing the curriculum to teachers in a way that allows them to understand formatting and reasoning, they can better partner with the administration to help students succeed.

Knowing that professional development is essential to high performing teachers and students, administrators must then choose what professional development would most benefit their educators. Since the learning needs and styles of adults differ from the students in their classrooms, administrators need to intentionally seek out high quality professional development opportunities. Beyond general professional development, STEM teachers need to develop skills that will help them implement both the NGSS and other future standards most effectively.

This research explores if certain types of professional development are more effective than others. Professional development is grouped into three main categories that will be more extensively explored: in-school collaboration, traditional professional development, and additional unconventional practices. Examples of each are discussed, and the benefits and drawbacks included. By the end of this paper, a clear argument for the importance of continued education of educators is explored. Special attention is paid to determine if particular professional development methods are of specific benefit to STEM instructors.

Chapter 2: Review of Related Literature

Introduction

Complexities abound in any classroom. There are unique blends of previous knowledge, language preferences, and areas of struggle, just to name a few. In the classroom, teachers strive to address students' individual needs while meeting curriculum standards and staying on track throughout the school year. The balancing act that teachers perform can be even more taxing when educators are asked to implement a new curriculum. As curriculum standards are changed and updated, schools must implement curricula that meet these standards. Teachers stand on the frontlines of this effort developing students' skills and critical thinking.

This heroic effort can be complicated and difficult when educators do not have the experience or support to achieve the goals set before them. While teachers dedicate themselves to serving their students, they themselves need the dedication of others to help them be their best. School years that add in new curriculum implementation by default add additional complications. The solution cannot be to never use new curriculum. Instead, professional development should be used to continually strengthen teacher skills, especially when curriculum is changing.

There are many different professional development models available

for teachers. Some being more easily accessible than others, but they are not all created equal. This review seeks to highlight the strengths and weaknesses of these methods. In order to facilitate the organization of these methods, they are broken into three main categories: in-school collaboration, formal professional development, and other additional practices. Just as in the classrooms they lead, educators need an organized plan and avenues to receive input and feedback to improve. There are variations in the overall cost of different professional learning methods, and many depend on continuing effort to achieve the greatest long-term impact. Some of the additional practices utilize familiar systems in a new way while others seek to harness the power of technology to improve teacher skill sets.

In-school Collaboration

Schools are teeming with professionals that have vast reservoirs of knowledge and experience. Harnessing the existing knowledge base in a school has the potential to be one of the most effective professional development systems. An added bonus is that many of these options are at little or no financial cost to the institution. These school community efforts recognize the many skills that administrators and teachers bring with them to the workplace and use them as a source of knowledge.

If learning communities are dedicated to improving their teaching skills and support systems, there are many benefits. This section will examine three models that can be used to develop educators in their specific teaching environment, while tailoring professional development to an individual learning community.

Implementation Meetings

When new curriculum is brought into a school, there are several steps that educational systems can take to smooth the transition. These implementation meetings should focus on specific factors for the educators to derive maximum benefit. Teachers should meet after trying new curriculum strategies to troubleshoot (Lynch et al., 2019). Discussions should also include ways to improve the use of various curriculum elements. These meetings also provide an opportunity for teachers to lesson plan the new curriculum. This motivation to move teachers out of their traditional silos provides additional opportunities for growth.

Instructional strategies that are not related to specific content have little impact on teachers (Penuel et al., 2012). Because implementation meetings are targeted to a specific curriculum and learning community, they do not have that same problem. Teaching communities that are afforded the opportunity to frequently interact and share a common vision can further develop concepts that have been introduced from other professional development sources (Penuel et al., 2012). The study performed by Penuel et al. (2012) found that it is not frequency of interaction alone that improved teaching results, but

frequency coupled with expertise is important. These collegial interactions must be intentional in order for participants to gain the most benefit.

Schools that make a strategic effort reap the rewards in sustained change. There is additional evidence that shows strong principal support and leadership shapes the school culture, which is necessary for a continued effort and plays an important part in professional development and curriculum reform (Lowe & Appleton, 2015). Schools that view curriculum as ready-to-use material often limit the time dedicated to professional development. Continuous professional development at a schoolwide level is most effective if teachers have the resources (i.e. quality support and training materials), dedicated time, and backing of the administration (Lowe & Appleton, 2015).

Teacher Collaboration

While teacher collaboration is an important element of implementation meetings, it has a broader applicability. Educators can continue to work together to form “School Based Learning Communities” (Penuel et al., 2012). Reviewing student work together can be an invaluable opportunity to discuss different teacher practices together and facilitate teacher willingness to experiment with other methods (Penuel et al., 2012). Studies have found that teachers that have had exposure to formal professional development benefitted the most from these smaller learning communities. Potentially, this is because they have largely homed in on their practice and now move to applying more complicated learning strategies to their classrooms (Penuel et al., 2012). Research has also indicated that expertise and frequency of interaction also play an important role. To that end, collaboration should be planned and prioritized in order to have the greatest impact. Research has also found that without guidance, teacher collaboration will readily focus on student work, emotional relief, and curriculum information (Muckenthaler et al., 2020). A safe environment should be fostered so teachers feel comfortable to share and evaluate their teaching practice struggles and common goals with their peers (Muckenthaler et al., 2020). A comparison done by Lynch et al. in 2019 found that teacher collaboration had one of the greatest impacts on STEM teacher instructional improvement.

Additionally, when teachers participate in professional development activities, they return to their school community and discuss them with other educators. This leads to other educators indirectly benefiting from the information attained by their coworkers. Research found that teachers who were mentored by those that attended development received “spillover effects” (Penuel et al., 2012). Thus, investing in the professional development of an individual educator can yield benefits for the educator themselves, their students, and both current and future teachers whom they mentor.

Apprenticeship

Schools have teachers at various stages of their careers. This fact lends itself to a mentor-mentee style of professional development. Glazer and Hannafin (2006) suggest a continual cycle of teacher development. By fostering interactions with new and experienced faculty members, newcomers are continually supported and mentored. There are benefits for both parties as they share experiences and benefit from mutual learning. Throughout the apprenticeship process, the veteran teacher supports the novice as they become more engaged and active in the school community. The symbiotic relationship results in the beginning teacher gaining insights, strategies, and ideas that they are supported in implementing. In turn, the experienced teacher can benefit from the recent education of the new teacher and gain insight about updated teaching practices.

In this model, the lead teacher designs the development process and provides individualized coaching and feedback to their peer teacher. Lesson plans are developed together, and the lead teacher is able to observe and support the new staff (Glazer & Hannafin, 2006). As the novice teacher gains experience, they become more proficient and can develop plans and activities independently. The cycle completes as the teacher has mastered many skillsets and is ready to become a mentor for a new teacher. This model fits well as the teaching community changes over school years, ensuring sustained professional learning and continuity of teaching knowledge.

Beyond the benefits to the students, this strategy found that teachers had an improved sense of belonging resulting in a friendly teaching environment with increased encouragement and participation (Glazer & Hannafin, 2006). It should be noted that years of teaching experience does not translate to being a good mentor. Teachers with mentoring skills should be focused on participating in apprenticeships. Additional barriers to this model require schools to intentionally plan similar preparation periods to allow time for mentoring, as well as central teacher offices or lounges to encourage interaction between teachers (Glazer & Hannafin, 2006).

Collins and Ting (2017) proposed taking this approach even further. Researchers recognized the disconnect between university-based teacher education programs and teacher practice. Instead, they proposed a program that involved integrating what is traditionally called “student teaching” throughout the entirety of the teaching program. Their concept would allow pre-service teachers to move back and forth from learning about a teaching theory and then immediately see it at work in a more realistic, complex school environment (Collins & Ting, 2017). They postulated that many apprenticeships are less successful due to oversimplification and are merely “showing and telling” (Collins & Ting, 2017). By recognizing the complexity of school systems, they believed that teachers would benefit from forming a better understanding of the relationship between theory and practice.

Traditional Professional Development

There are particular professional development models that have been classically used to aid teacher growth. These time-tested styles are the examples that are usually thought of when discussing professional learning. These are important to note as high-quality professional development has been proven to help teachers as they instruct students (Moore et al., 2024). This section will explore these common modalities for skill development. First, the long-standing professional development workshop or conference style will be reviewed. This is followed by the modernized version that has gained popularity – online training. Lastly, in-class observations will be discussed in terms of the ability to utilize the model as a personalized professional development tool with immediate feedback on teacher development.

Workshops and Conferences

Professional development workshops are common ways for teachers to learn new teaching strategies and skills. Yet, often, the concepts learned at these short format training events are filed away and not implemented in their classrooms (Naizer et al., 2017). It is not the workshop format itself that is problematic, but the short-term nature of the learning. In the science field specifically, studies showed that teachers have inadequate knowledge and feel unqualified to teach the material (Naizer et al., 2017). Research found that workshops conducted over several successive summers had improved success with classroom strategy implementation (Naizer et al., 2017). When this style is used to scaffold teacher learning, they are more confident in the skills they use in their classrooms (Naizer et al., 2017).

Studies showed that in order for professional learning to be most effective it must be sustained (Helmke & Bouffard, 2023). Since many workshops and conferences are short-term events, organizers need to pay specific attention to clear strategies and takeaways for their participants (Helmke and Bouffard, 2023). Researchers Helmke and Bouffard (2023) suggested that there are specific actions that improve attendee results including workshop facilitators providing expectations for learning, gathering commitments to try practices before participants leave, and sending follow-up surveys. Employing these tactics helped teachers more consistently employ what they learned in their regular classroom teaching practice.

Online Training

Online professional development courses are a benefit to those that cannot travel to workshops and those who work in rural areas as they may not have access to many professional development opportunities. In a study by Moore et al. 2024, researchers compared classroom outcome of educators that attended a three-day workshop to those that participated in an online learning community that included interacting with other participants, both synchronously and asynchronously. This study focused on middle school

science teachers that were implementing new NGSS aligned curriculum. The areas of study included teacher knowledge, change in teacher practices toward more student-centeredness, and overall student growth in knowledge of the content knowledge. Analyzing each of these areas individually found that there were no significant differences in the outcomes when comparing in-person professional development to online professional development (Moore et al., 2024). This delivery method has been found to be especially helpful for teachers in rural areas or schools with limited budgets to send teachers to in-person workshops.

An additional discovery of this research is that it encouraged educators to move beyond technology as a tool and be able to implement it to network with other teachers (Moore et al., 2024). They also found that in order to produce systemic change in teaching practice, professional development must be embedded in their day-to-day, which is more achievable in an online format. Another research project found that when teachers perceived the online training to be high-quality, they benefited more from the program (Fütterer et al., 2024). This same project also showed that teachers that are intrinsically motivated engaged more with the material. When quality online programming was paired with high motivation, the results were “more than additive” (Fütterer et al., 2024).

In-class Observation

Teacher observations have long been used as a way to ensure teachers employ solid classroom management skills. However, there are many ways to harness the observation opportunities and exponentially increase the benefits to the teacher and, thereby, the students. A study conducted by Cilliers et al. in 2018 compared teachers that participated in short term workshops (“training”) with those that received monthly observations (“coaching”). The research team discovered that instructors who received regular feedback from observations throughout the school year had a significant increase in student learning outcomes (Cilliers et al., 2018).

Teacher observations encourage instructors to implement new teaching methods in the classroom while being able to receive real-time feedback about how effective the strategy was (Cilliers et al., 2018). Additionally, the information they receive is targeted to their specific teaching practice as instructors demonstrate the application of appropriate teaching techniques. Researchers found that instructors with coaches were more likely to try technically challenging teaching methods when they were regularly observed and coached throughout the school year (Cilliers et al., 2018). This indicates that many teachers are not resistant to new methods, but instead need support in order to feel confident in the implementation of these strategies.

Research has also found that educators improve their practice when they know they are going to be observed (Phipps & Wiseman, 2021). Additionally, their research showed that subsequent observations resulted in

further improvement. (Phipps & Wiseman, 2021). This highlights the importance of having regular observations. In doing so, teachers strengthen their skills, which leads to improved student outcomes. Phipps & Wiseman (2021) suggested that teachers work toward pedagogical goals when there are impending, yet unannounced, classroom observations.

Another additional benefit of this professional development method is the cost-effective nature of observations. Many other professional development models involved added time and cost for either the educator or the school. In-class observations allow schools to utilize existing resources (other staff or administrators) to observe and offer insight and feedback. Since the lessons must be taught anyway, it essentially costs the school just the time of the observation person and the teacher-observer discussion after the class period. The fact that these observations on the whole cost less but have better outcomes make this one of the best options for schools with a limited professional development budget.

Additional Unconventional Practices

Beyond traditional modes of professional development, schools have sought novel ways to expand teaching strategies. Just as there are many ways to teach, there are many ways to teach a teacher. Not every strategy and style is a good fit for everyone, and to that end many novel professional learning concepts have been developed. Although only a few are addressed in this paper, they demonstrate creative ways to broaden teacher skill sets.

One common thread in all of these methods is they address the personalized way that people learn. By avoiding a singular approach, these methods can improve the strengths and develop the weaknesses of the participants. The ideas presented here are collaborations between local universities and school systems, customized teacher professional development, and professional book clubs.

University and School Partnerships

One novel way to expand teacher strategies has been to partner with local universities. Research has shown that one of the benefits of these types of collaborations includes increased technology integration in the classroom (Thomas et al., 2012). Additionally, it helps address issues caused by siloing of teachers and introduces them to a variety of teaching practices (Burroughs et al., 2020). By developing a collaborative relationship between professors and teachers, both parties stand to gain. Teachers gain understanding of what level of knowledge is expected as students progress toward college, while professors become familiar with state required curriculum standards (Burroughs et al., 2020). Educators and students at both campuses benefit from the knowledge exchanged in this process.

However, there are significant difficulties that can make this strategy less appealing. Studies show that finding a professor and teacher pairing that

have similar teaching styles is beneficial (Burroughs et al., 2020). Finding these pairs, then creating and maintaining their commitment to several years of professional development can be a hurdle (Thomas et al., 2012). It is also imperative that neither party comes with an attitude that they are going to fix the other (Thomas et al., 2012). In the end, if both parties work together, observing and modeling the others' practice, both schools and teachers move the education of their students forward (Burroughs et al., 2020).

Teacher Specific Professional Development

Meeting teachers at their specific point of need will always be the ideal way to enhance professional learning. It is important to note that beginning teachers have a specific and unique set of uncertainties that benefit from additional training and support (Hirsch et al., 2021). Many cite a "sink or swim" mentality that is especially challenging, while simultaneously noting that student management is their top concern (Hirsch et al., 2021). In a review of eight studies, Hirsch et al. found that no model of professional development resulted in any negative findings. Instead, they found that any degree of support and intervention was helpful in preventing burnout in new teachers.

Once science educators overcome the early hurdles of teaching, there are specific needs of the NGSS that they must learn how to handle. Specifically, the NGSS asks teachers to move their students' primary focus to understanding natural phenomena (Lowell & McNeill, 2023). Using professional learning paired with high-quality curriculum is particularly effective in improving student learning outcomes (Lowell & McNeill, 2023). This combination also has positive impacts on educators. Lowell and McNeill found that using iterative rounds of classroom learning with reflection on the professional development exercise was especially effective. This desire to continually improve while being provided the tools to achieve this goal is important to helping teachers implement change. Teacher guides do not help teachers more effectively implement curriculum, nor are teachers provided instruction about how to use the curriculum they have been given (Hayden et al., 2024). Additionally, there are variations in classroom norms that vary by school community and its value of science education (Capabianco et al., 2017). There should be a framework that teachers can use to develop learning through being active in designing the curriculum to work for their specific group of students. Teachers also need to be able document their instructional strategies and decisions in order to determine what changes should be addressed during future implementation efforts (McHail, 2018).

Professional Book Clubs

While book clubs are not a new or unique concept, they have not been widely used as a tool for professional development. This style of development embeds many important aspects of adult learning including a respectful

atmosphere, active participation, and self-directed learning (Blanton et al., 2020). In these book club communities, participants share interests or want to learn about a specific topic. Books were selected by the group, which helped to encourage active participation. Another key feature of this practice is the informal setting with a general shared interest in learning. A review of several different book clubs provided interesting insight regarding the professional advancement outcomes. Research found that pre-service teachers leaned heavily towards books with practical implications, where long-term teachers chose books that explored more theoretical teaching topics, such as understanding student needs and how teachers approach teaching (Burbank et al., 2010).

Researchers found that some book clubs lean toward a “process theme” in which the members gravitated toward a supportive and companionship mentality (Blanton et al., 2020). The group members often took time during book club meetings to collaborate on new ideas, swap knowledge, and combat general isolation. Members often compared literature to their own experiences or their college experiences. Additionally, during their discussions they shared differing perspectives and brought new ideas to the group. Overall, these book clubs resembled learning communities (Blanton et al., 2020).

A second style of book club resulted in an “outcomes” focused group (Blanton et al., 2020). The members of these groups took each meeting as an opportunity to implement a new strategy in their classroom. By continuing to make changes in their thinking about teaching, students, and themselves, these group members implemented many of these ideas and changed their instructional practices (Blanton et al., 2020).

Additionally, researchers found that book clubs that brought together both pre-service teachers and experienced teachers were successful. The differing levels of experience were set aside as conversation focused on the book material (Burbank et al., 2010). The research showed that while a potentially useful tool, participants must be intentional to link the discussion topics to daily teaching practice (Burbank et al., 2010).

Overall, this research discovered that nearly every participant found topics relevant and applicable to learning. Furthermore, participants continued to seek out books that contributed to professional growth. Beyond improving their own teaching practice, they shared what they learned with their fellow teachers and parents (Blanton et al., 2020). This method of professional development allowed educators to work in groups with similar areas of interest to grow their skill sets together.

Summary

This topic covered a multitude of avenues for professional learning and development. Varying from simple classroom observations to more complex university and school partnerships. The types of professional development are as diverse as the school communities they represent. However,

there are several unifying pieces that are echoed throughout the most successful types.

In order for professional development to be most effective, it must be continuous. While workshops and conferences can be beneficial, they are more effective when paired with pre and post event material, discussed with small groups after the event, or when part of a series that an educator participates in over the course of the event (Naizer et al., 2017). This was repeated with the professional book club research, as they found many teachers chose to continue meeting and choosing new books to read as a group after the researchers ceased to choose books for them (Blanton et al., 2020). By regularly working with teaching strategies, they are front of mind as educators return to their classrooms.

Another important part of professional development is independent of the learning itself. Teachers must feel supported in their endeavors to grow their skills and teaching strategies. This provides the foundation of confidence for them to implement what they have learned in their classrooms. Having the encouragement of their administrators and their school community provides a safe environment for teachers to hone their craft.

Thirdly, teachers are more vested in their professional development when they have the autonomy to decide. While in some cases it may be convenient to hold a workshop on-site for all teachers to attend, it may not be the most effective option. By allowing educators the choice of several opportunities, they are allowed to choose what they are already more drawn to. This allows teachers to pick professional development modes that are best suited to their teaching subject and style.

Finally, professional development works best when there is active involvement and participation. Just as direct instruction is part of learning, it should not be the only way information is presented. Educators should be drawn in and engaging with the professional development both during the training and in their own classrooms. As the goal is to learn new teaching strategies, teachers should feel confident enough in what they learned to return to their own classrooms and implement what they heard. By having educators practice and discuss ways to improve, they are more likely to put their education to work in their own teaching space.

While numerous modes of professional development have been presented, additional conclusions and areas warrant further research. Educators strive to teach others, yet continuing to learn the most effective methods to achieve this goal completes the cycle. Professional development holds the potential to enhance the teaching practices of all who engage in these opportunities. The subsequent chapter will delve into further implications and explore potential research avenues within this critical area.

Chapter 3: Implications

Introduction

Teachers are on the front lines of the education system. While they go through extensive training programs to enter the profession, it is best if they continue to develop their practice. There are already many demands for resources at schools, so maximizing professional development opportunities is essential. This research explored many different modes of professional development available that varied from simple to complex, at school or away, and common to unusual. Participating in these programs is essential to continuous improvement and refining teacher practice.

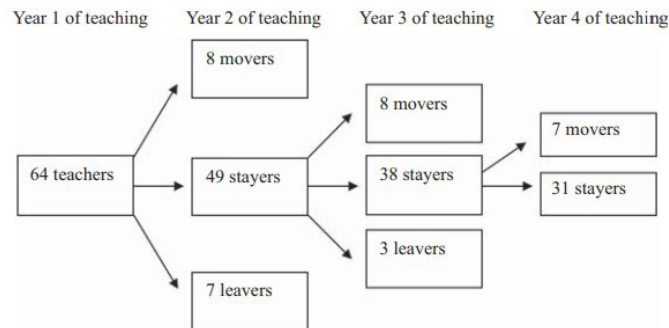
There are changes that schools should adopt in order to reap the benefits of teacher involvement. Foundationally, they need to make it reasonably accessible for educators to participate. This chapter discusses many of the conclusions drawn from this research, practice and policy implications, and potential areas of further study.

Conclusions

The importance of professional development is well documented. As evidenced by the research presented here, there are many delivery methods that can be customized to appeal to every individual. Each style has strengths and weaknesses, but none of the explored varieties had negative impacts (Hirsch et al., 2021). This demonstrates that any time spent on professional development is not wasted. Not every educator has similar access to continuing education, so taking advantage of available opportunities should always be encouraged (Moore et al., 2024). A study conducted in 2019 that explored teachers that stayed at their current school (“stayers”), teachers that moved to other schools (“movers”), and teachers that left the profession (“leavers”) found that some of the greatest factor in teachers that stayed was professional development and administrative support (Redding et al., 2019).

Figure 1

Example of Teacher Retention



Note: A study of 64 mathematics teachers from in 11 school districts across 4 states found that professional development and administrative support were the largest contributing factors determining if teachers stayed at their current school or left either the school or the profession completely during their first year. From “*School Administrators’ Direct and Indirect Influences on Middle School Math Teachers’ Turnover*,” by C. Redding, L. N. Booker, T. M. Smith, and L. M. Desimone, 2019, *Journal of Educational Administration*, 57(6), p. 713. (<https://doi.org/10.1108/JEA-10-2018-0190>) Copyright 2019 by Emerald Publishing Limited

Research has shown that the background of a teacher does not always indicate the most suitable method for professional development (Hirsch et al., 2021). Instead, there are two attributes that have been shown to be clear indicators of consistent implementation and effort: teacher choice and sustained involvement (Helmke & Bouffard, 2023; Penuel et al., 2012).

Allowing educators choice in professional development avenues that are of greatest interest to them results in teachers being more likely to implement the strategies gained from these experiences (Blanton et al., 2020). Being able to discuss these ideas with those in their social networks also leads to a higher likelihood of weaving new practices into their classrooms (Penuel et al., 2012). Investing in the opportunity for educators to learn about new strategies helps them keep their teaching practice on track with current methodologies. Allowing educators to select the methods by which they learn these practices grants them autonomy and fosters a vested interest in their own educational process.

Another critical factor for success is long-term implementation. One of the ways this can be achieved is by selecting professional development opportunities that include continued follow-up with the educator. For example, a workshop that sends follow-up email surveys about implementation success. A different option would be to select an inherently long-term approach such as mentoring or a book club.

No matter what an administrator or educator chooses, the evidence is clear. The best results happen when a teacher picks something and works at it consistently.

Practice Implications

The implementation of new teaching strategies has a direct impact on teaching practice. Professional development enhances the skills and knowledge of educators. They learn about the latest research in educational theories, as well as curriculum changes related to state teaching standards. This affords them the opportunity to more effectively implement teaching practices in their classrooms. Requiring teachers to report out about including new strategies used in their classrooms is a simple way to confirm educators are trying what they learned.

These professional development exercises also provide an opportunity

for teachers to reflect on their current practice and evaluate the effectiveness of various aspects of their classroom management. Identifying areas of struggle is a critical part of teaching practice continuous improvement. Adjusting throughout their careers allows educators to adapt and refine their teaching. While it can be uncomfortable to recognize areas that need work, an annual self-assessment could provide a simple format for reflection.

Increasing the use of classroom observations is another technique that provides immediate feedback for the instructor. By allowing other educators to observe and make suggestions, learning communities can foster an environment that values growth and moves towards sharing best practices. Creating a schedule for teachers to round robin visit others' classrooms throughout the academic year breaks this task down into manageable pieces for all parties involved.

Policy Implications

One of the key policies changes that should be undertaken is making professional development mandatory. Avoiding prescriptive language allows for flexibility in the way educators meet the requirement. By forcing teachers to participate in continuing education of their choosing, learning communities partake in a variety of programs and share their varied knowledge with each other.

It follows that the administration will need to set aside funds for continuing education activities. There should be a plan put into place to ensure that these funds are reserved each year to support staff development. Policies show the administration's dedication to these activities. This also eliminates situations where only proactive teachers receive funding for professional development endeavors or situations where only some teachers are given the opportunity to participate in professional development.

Many schools may not have access to funding for professional development. In these instances, policies for mentoring, classroom observations, and teacher collaboration are even more important. These styles of professional development instead require that policies include dedicated time for these activities to occur.

Directions for Future Study

This paper focused on the delivery methods of professional development for educators. Much research was available about how to support beginning teachers. However, further study should be conducted about how to encourage veteran teacher growth. Supporting teachers that are in the prime and sunset of their careers may help prevent teacher burnout and ensure that educators feel supported through all stages of their careers. This will assist administrators in setting suitable goals for educators at various points in their professional arc. Additionally, the correlation between hours of professional development and teacher confidence during STEM curriculum implementa-

tion should be examined. While there is research that shows STEM teachers often feel uncertain in their capabilities, there is a lack of research that addresses how to bolster their confidence and knowledge during the curriculum implementation process.

Summary

Schools are an active, vibrant work environment and each one is unique. Curriculum development and adjustment in state standards are part of the ever-changing landscape that teachers navigate. New research advances teaching practices and educational pedagogies. In the pursuit of continuous improvement, educators benefit from participating in professional development activities. There are a myriad of options for professional development. This paper explores many types encompassed in three main groups: in-school collaboration, traditional professional development, and several unconventional methods.

The types of professional development reviewed have unique aspects to each of them, making them particularly beneficial in certain circumstances. In-school collaboration may be most appealing to schools with limited budgets. Harnessing the knowledge of experienced teachers through mentoring and shared learning communities can foster a healthy school environment. However, in order for these to be successful administrators must provide adequate time and opportunity for teachers to participate.

Traditional professional development methods include activities such as workshops, online training, and classroom observations. Workshops and trainings are usually easy to find, and the increase in online training options is beneficial for those with limited access to urban areas where events are often held. High quality professional development has proven to be beneficial for teachers and improves student outcomes. One way these modalities can be additionally effective is if they include continued follow-up after the event to encourage implementation.

Lastly, the paper explores unconventional professional development methods that may appeal to unique situations. Schools that are situated close to universities may be able to develop partnerships with faculty there. Teachers may also utilize opportunities to craft their own professional development. By piecing together curriculum with teaching practices that are interesting to them, they can devise a plan specific to their needs. Finally, the paper examines professional book clubs that convene educators to collaboratively read, discuss, and implement strategies for classroom management and instructional practices. These groups also help teachers develop a group that can be both a support and a sounding board for ideas.

No matter what style of professional development is chosen, research has found that there are no negative impacts. Instead, the keys to successful professional development are teacher choice and long-term implementation strategies.

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The Impact of Parental Involvement on Elementary-Aged Student's Reading Achievement

Maya Owen

Abstract

Parental involvement in education is key to student's academic achievement, especially in reading. Limited or no parental involvement in a child's education can hinder students' academic success as parental involvement is positively related to students' academic performance. This research aims to investigate the effect of parental involvement on elementary-aged students' reading achievement. Research on parental involvement is needed to identify the types, barriers, and effects of parental involvement to avoid student's academic underachievement. A review of recent literature showed that parental involvement in education had positive effects on student's academic achievement. Existing studies determined that both home-based and school-based parental involvement are necessary to improve student's reading achievement. Parents, educators, and schools must collaborate to address barriers to parental involvement to respect and integrate family needs. Current research revealed that parental involvement plays an important role in improving elementary-aged students' reading achievement. Based on this research, educators should establish partnerships with parents where educators implement strategies to help and support parents from different backgrounds to be involved in their child's literacy process. Governing authorities can implement programs and provide additional funding to schools to increase parental involvement. To best support parents to be involved in their child's education, professional development for teachers can be enhanced. The comprehensive knowledge and understanding of parental involvement can help parents to be more involved in their student's education, thus improving their reading achievement.

Chapter 1: Introduction to the Project

Background

Parents play an important role in their students' education. Parental involvement in education has been recognized as a critical factor in children's academic success, particularly in the area of literacy (Steiner et al., 2022). Research consistently demonstrates that when parents actively engage in their children's learning, students are more likely to exhibit higher levels of achievement and motivation (Auerbach et al., 2019; Çalışkan & Ulaş, 2022; Iroegbu & Igweike, 2020; Steiner et al., 2022). There are many definitions and forms

of parental involvement. Parental involvement refers to the participation of parents in their children's education and schooling activities. This involvement can be presented in various forms, including helping with homework, attending parent-teacher conferences, volunteering at school events, and fostering a supportive home environment for learning.

Parents frequently limit their involvement to their home environment which includes helping with homework, discussing school activities, setting expectations, and monitoring their student's progress (Antony-Newman, 2019). Additionally, research findings have shown that many parents are involved with their children's education, working with schools and their children, which is often not always known to teachers (Belaić, 2021; Hill, 2022). The significance of parental involvement in reading achievement stems from the varied roles that parents play in their children's educational journey.

Parental involvement creates an important literary environment for children, which plays an important role in shaping children's reading behaviors and motivations (Yang et al., 2023). Parents serve as primary caregivers, role models, and first educators, shaping children's attitudes, behaviors, and perceptions toward learning. In the context of reading development, parents can provide crucial support through activities such as reading aloud, discussing storylines, and fostering a rich reading environment at home.

The effects of parental involvement on elementary-aged students' education have been the subject of much research. Research studies have shown that parental involvement can lead to higher student achievement (Ates, 2021; Bryce et al., 2019). While there is much research on the effects of parental involvement on student's educational achievement, many studies exist that focus on the impact of parental involvement on students' reading achievement. Recent studies continue to affirm the relationship between parental involvement and children's reading achievement. For example, a study by Steiner et al., (2022) found that consistent parental engagement, including activities such as reading at home and various reading strategies, significantly predicted gains in reading achievement among elementary students.

The impact of parental involvement on students' reading achievement is particularly important as reading is a necessary skill for students' learning environment. Without this skill, students are less likely to have academic and occupational success in the future (Iroegbu & Igweike, 2020). Reading proficiency is a critical skill that forms the foundation for academic success across various subjects. Proficient readers are better prepared to comprehend complex texts, engage critically with information, and be successful in school. Research shows that children who struggle with reading in elementary school often face academic challenges later in their education (Auerbach et al., 2019). Improved reading achievement can help a student succeed in many content areas, thus aiding in overall academic success.

Despite its benefits, parental involvement in children's education

can face challenges and barriers. These may include (a) parents' educational backgrounds, (b) socioeconomic factors, (c) language barriers, (d) time constraints due to work or other responsibilities, and (e) lack of awareness about the importance of parental involvement in their child's education. As children progress through elementary school, they face many developmental and academic challenges where parental involvement is important as a form of support for children to be successful in the classroom (Bryce et al., 2019). This remains true in the years of elementary education, where children develop the fundamental skills necessary for future academic endeavors.

Unfortunately, parental involvement declines as children get older. The main form of collaboration between parents and educators is through parent-teacher meetings, but the prevalence of conversations and conferences between the parents and the student's teacher decreases as children get older (Milosavljević et al., 2022). Understanding that parental involvement is more common for elementary-aged students, allows researchers to determine the impacts of parental involvement on elementary-aged students' academic achievement, specifically their reading achievement. Studies on parental involvement with at-home reading activities have been shown to have positive effects on reading comprehension, reading motivation, and reading attitudes (Çalışkan & Ulaş, 2022). Similarly, other studies have proved the positive relationship between parental involvement and students' reading achievement.

Statement of the Problem

The limited or lack of parental involvement in a child's education can hinder students' academic success, as parental involvement is positively related to students' academic performance. The significance of understanding how parental involvement affects students' reading achievement is complex. Research shows that parental involvement plays a crucial role in academic success, including reading achievement (Elish-Piper, 2024). Understanding how different levels and types of parental involvement impact reading achievement can help identify differences in educational outcomes and develop strategies to promote equity in education. The improvement of reading achievement among elementary-aged students is important as reading proficiency is strongly linked to future academic and professional success. Iroegbu & Igweike (2020) stated that education plays a meaningful part in a child's life, and reading is an essential aspect of education that every learner needs.

Parents can have an integral role in their child's academic success through their involvement in various educational activities. As it pertains to reading, Auerbach et al. (2019) express that the quality of a child's home learning environment has long-term positive effects on reading proficiency. Understanding the impact of parental involvement on reading achievement can also shed light on familial relationships.

Purpose of the Project

The purpose of this research project is to investigate the influence of parental involvement on the reading achievement of elementary-aged students. Through literature review and research findings, this project will explore the various forms and levels of parental involvement. While many studies have focused on the quantity of parental involvement activities, such as the frequency of reading with children, there is less attention put on the quality of parental involvement activities and practices. Specific components of effective parental involvement in reading can also be examined, including the quality of parent-child interactions during reading and the amount of scaffolding and support for children's reading development. This research project will review current studies regarding the impact of parental involvement on elementary-aged students' reading achievement. The paper will determine whether parental involvement impacts students' education, and it will find variables that might affect the educational development of elementary-aged students.

This research explores the impact of how parental involvement impacts elementary-aged students' reading achievement. This project will review guidance on parental involvement to prevent future consequences related to reading achievement of elementary-aged students. Research on parental involvement is necessary for identifying effective strategies to support children's learning, promote early intervention, and strengthen parent-school partnerships. All of these aspects are critical to avoid future consequences related to students' academic underachievement and/or disparities in their educational outcomes.

Theoretical Framework of the Project

The theoretical framework of this project is the social learning approach to students' educational development and academic achievement. According to Bandura (1971), a person's learning abilities are best understood by the constant interaction between behavior and its regulating circumstances. Social Learning Theory as outlined by Albert Bandura emphasizes how social factors shape behavior and cognitive processes. Bandura states that "virtually all learning phenomena resulting from direct experiences can occur on a vicarious basis through observation of other people's behavior and its consequences for them" (Bandura, 1971, p. 2). The ability of a person to learn through observation allows that person to gain examples of behavioral tendencies. Through Bandura's research, he proposes that numerous older students have embraced the criteria for success through modeling and feedback from others (Bandura, 1971). Therefore, the environment that surrounds students aids in their educational development and academic achievement.

Albert Bandura outlines many important aspects of the Social Learning Theory. An important concept that Bandura (1971) offers is learning by

direct experience. Bandura states that “in the social learning system, new patterns of behavior can be acquired through direct experiences or by observing the behavior of others” (Bandura, 1971, p. 3). Bandura (1971) believed that actions are automatically and unconsciously strengthened by the experiences a person undergoes further explaining that individuals learn by observing the behavior of others and the consequences of those behaviors. Several behaviors that individuals exhibit are learned through examples or by modeling, which is another important concept proposed in Social Learning Theory (Bandura, 1971). In this way, individuals are watching what others do and modeling what they do and say through observational learning. Social Learning Theory proposes that individuals learn not only through direct experiences but also through observing others and the consequences of their actions. Moreover, Social Learning Theory highlights the role of consequences and reinforcement in shaping behavior. People observe the consequences of their actions and determine what types of behavior elicit positive or negative responses (Bandura, 1971). Individuals can use these responses as a guide for future actions and behaviors. Reinforcement works as a tool through which individuals receive feedback about the desirability of their behaviors, influencing the likelihood of those behaviors being repeated. Social Learning Theory also suggests that individuals are motivated to engage in certain behaviors based on the anticipated consequences of those behaviors, and reinforcement determines which of these consequences influence behavior.

Social Learning Theory provides a framework for understanding how parental involvement in reading can influence students’ reading achievement. According to this theory, children learn by observing the behaviors and actions of others, particularly their parents. When parents actively engage in reading activities with their children, they provide opportunities for observational learning. Children observe their parents’ reading behaviors, such as reading fluency, comprehension strategies, and motivation for reading. Through observation and direct experience, children can acquire new reading skills, strategies, and attitudes toward reading. Modeling is another essential concept of Social Learning Theory that applies to parental involvement. Parents serve as models for their children’s behavior, including reading behavior. Children are more likely to emulate the reading behaviors and attitudes they observe from their parents. This modeling can instill a positive attitude towards reading and promote positive reading achievement. Additionally, social reinforcement from parents can create a supportive learning environment that encourages children to persist in their reading efforts and take pride in their accomplishments. Children also learn by receiving reinforcement or feedback for their behaviors. When parents positively reinforce their children’s reading efforts and achievements through praise, encouragement, and recognition, they provide reinforcement that can strengthen children’s motivation related to reading.

In the context of reading, parental involvement can take various

forms. When parents actively engage with their children during reading activities, and when they provide support, feedback, and encouragement, children are more likely to develop strong reading skills. Moreover, when parents model reading behaviors and demonstrate a positive attitude towards reading, children are also more likely to develop an interest in reading themselves. Educators and parents can work together to create supportive environments that promote children’s reading achievement with the understanding of observational and experience learning, modeling, and reinforcement.

The theory of Cognitive Constructivism as outlined by Lev Vygotsky (1978) enhances the theoretical framework of this research project. Bandura’s Social Learning Theory and Vygotsky’s Theory of Constructivism offer complementary perspectives on how individuals learn and develop, particularly in the context of parental involvement and its impact on students’ reading achievement. Vygotsky’s Theory of Constructivism is more likely to be referred to as social cognitive learning. The combined perspective from Bandura (1971) and Vygotsky (1978) acknowledges the importance of social interaction and individual environment in constructing knowledge within the learning process. Both Vygotsky and Bandura emphasize the active role of the student in the learning process.

Vygotsky introduced the concept of the Zone of Proximal Development (ZPD), which refers to the range of tasks that a learner can perform with the help of a more knowledgeable individual (Vygotsky, 1978). Bandura’s Social Learning Theory complements this by emphasizing the role of observation and modeling in learning. Parents, as knowledgeable individuals, can scaffold their children’s learning within their ZPD by providing support, guidance, and modeling during reading activities. Both Vygotsky (1978) and Bandura (1971) highlight the importance of social interaction in learning. Vygotsky’s (1978) Cognitive Constructivism Theory emphasizes the role of scaffolding, where more knowledgeable individuals provide support to learners as they engage in challenging tasks. Similarly, Bandura’s (1971) Social Learning Theory emphasizes how individuals learn through observing and imitating the behaviors of others, particularly significant role models such as parents.

Parental involvement in reading activities can provide opportunities for scaffolding and social interaction, which can enhance students’ reading achievement. Vygotsky emphasized the significance of language and communication in cognitive development (Nurhasnah et al., 2024). According to Vygotsky (1978), language plays a crucial role in promoting learning. Similarly, Bandura’s (1971) Social Learning Theory also acknowledges the importance of language and communication in the learning process. Through verbal instructions, explanations, and discussions during reading activities, parents can support children’s understanding of reading materials and promote their reading achievement. Additionally, Vygotsky (1978) and Bandura (1971) emphasize the influence of cultural context and socialization on learning.

Parental involvement in reading can be influenced by cultural beliefs and practices, which, in turn, can impact students' reading achievement.

Both theories acknowledge the critical role of parents in children's learning and development, with an emphasis on the importance of social interaction in the learning process. Bandura's (1971) theory highlights how parents serve as models for their children's behavior and provide opportunities for observational learning. Vygotsky's (1978) theory highlights the role of social interaction and collaboration in cognitive development, particularly through activities that involve joint problem-solving and scaffolding by parents. Bandura's (1971) Social Learning Theory similarly emphasizes how individuals learn through observation, imitation, and modeling of others' behaviors, particularly significant role models such as parents.

In the context of parental involvement in reading, social interaction between parents and children during reading activities can facilitate learning and enhance reading achievement. By integrating both Bandura's (1971) Social Learning Theory and Vygotsky's (1978) constructivist perspective, a comprehensive framework is provided for how parental involvement in reading affects students' reading achievement. This combined theoretical approach emphasizes (a) the interactive and social nature of learning, (b) the importance of scaffolding and social interaction, (c) the role of language and communication, and (d) the cultural context in shaping children's reading achievement.

Definition of Key Terms

The following terms will be referenced throughout the project when referring to the impact of parental involvement on students' reading achievement.

Academic achievement: The level of success attained by students in their academic endeavors, often measured through grades, test scores, and other assessments (Ates, 2021).

Educational development: The progress and growth of students in terms of their academic skills, knowledge, and abilities.

Elementary-aged students: Refers to children typically between the ages of 5 to 12 years old, corresponding to grades kindergarten through sixth grade in the U.S. education system

Literacy development: This term refers to the overall process of acquiring reading and writing skills, including phonological awareness, phonics, vocabulary development, and comprehension strategies.

Modeling: The act of demonstrating behaviors or attitudes that others, particularly children, observe and imitate (Bandura, 1971).

Observational learning: The process by which individuals acquire new behaviors or skills by observing and imitating others (Bandura, 1971).

Parental involvement: This term refers to the extent to which parents are actively engaged in their children's education, including activities such as reading with their children, assisting with homework, attending parent-teacher conferences, and participating in school events (Hill, 2022).

Parent-school collaboration/partnership: Refers to the cooperative relationship between parents and schools aimed at supporting student learning and academic success.

Professional Development: Refers to the ongoing training or learning of educators to improve their knowledge and skills of educational practices to best serve their students.

Reading achievement: This term encompasses various aspects of reading proficiency, including decoding skills, fluency, comprehension, vocabulary, and reading motivation.

Reinforcement: The process of encouraging or discouraging certain behaviors through the consequences that follow those behaviors, which can include positive reinforcement (reward) or negative reinforcement (punishment) (Bandura, 1971).

Social constructivism theory: A social cognitive learning theory propped by Lev Vygotsky, emphasizing that individual development is strongly influenced by culture, where a child's learning process is influenced by the culture of his or her family environment (Vygotsky, 1978).

Social learning theory: A psychological theory proposed by Albert Bandura, emphasizing how individuals learn through observation, imitation, and social interaction, and how external reinforcement and modeling influence behavior (Bandura, 1971).

Socioeconomic status (SES): This term refers to an individual's or family's social and economic position in society, which can impact parental involvement and children's reading achievement.

Zone of Proximal Development (ZPD): This term was defined by Vygotsky which represents the space between what a student is capable of doing on their own, what a student can do with the support of teachers or parents, and what the learner cannot do on their own or with support (Vygotsky, 1978).

Summary

The role of parental involvement in elementary-aged students' education, particularly in reading achievement, is crucial and multifaceted. Various forms of parental involvement exist, ranging from attending parent-teacher conferences to supporting reading activities at home. Research demonstrates that parental involvement positively impacts students' academic achievement, including their reading achievement, which is foundational for academic success. However, the focus of this research often lies on the quantity rather than the quality of parental involvement activities. Reading proficiency is essential for academic success, making parental involvement in reading activities critical

during a child's elementary years. Parental involvement tends to decline as children progress through school, which emphasizes the importance of early parental engagement. Effective parental involvement in reading entails not only frequent engagement but also meaningful interactions and support during reading sessions.

The theoretical framework for this research project is enhanced by integrating both Albert Bandura's (1971) Social Learning Theory and Lev Vygotsky's (1978) Theory of Cognitive Constructivism, also known as Social Cognitive Learning. Albert Bandura's (1971) Social Learning Theory emphasizes the role of social factors in shaping behavior and cognitive processes. Bandura's (1971) theory underscores the importance of observational learning, reinforcement, and modeling in educational development and academic achievement. These aspects of Social Learning Theory, as proposed by Bandura (1971), demonstrate how children acquire reading skills and attitudes through their parents' behaviors and feedback. Similarly, Vygotsky's (1978) Theory of Constructivism emphasizes the collaborative construction of knowledge within social environments. This theory introduces the concept of the ZPD, highlighting the role of more knowledgeable individuals, such as parents, in scaffolding children's learning.

Vygotsky (1978) stresses the importance of language in promoting cognitive development. Through language-rich interactions during reading activities, parents can support children's understanding of reading materials and promote their reading achievement. These perspectives offer complementary insights into how individuals learn and develop within social contexts, particularly concerning parental involvement in the learning process. Parental involvement in reading activities provides opportunities for both scaffolding and observational learning, enhancing students' reading achievement through social interaction and collaboration. Integrating both Bandura's Social Learning Theory and Vygotsky's Constructivist perspective provides a comprehensive framework for understanding how parental involvement in reading affects students' reading achievement.

Chapter 1 identifies the limited or lack of parental involvement as a barrier to student's academic success, especially in reading achievement. Understanding how parental involvement affects reading achievement is crucial for enhancing students' overall academic outcomes. This research project aims to investigate the influence of parental involvement on elementary-aged students' reading achievement. By reviewing literature and research findings, the paper seeks to explore different forms and levels of parental involvement, focusing on both quantity and quality. The project intends to provide insights for parents and educators, offering guidance on effective parental involvement strategies to enhance reading achievement and prevent academic underachievement. Educators and parents can collaborate to foster environments conducive to children's reading success after understanding how parental

involvement influences reading achievement. This research aims to explore the extent of parental involvement in reading and its implications for elementary students' educational development, providing insights for policy, practice, and parent-school partnerships to enhance reading outcomes and prevent academic underachievement.

Building upon this foundation, Chapter 2 will further explore the research surrounding parental involvement and its impact on elementary-aged students' reading achievement. The literature review will synthesize existing studies, examining and outlining the various forms, types, and levels of parental involvement. Furthermore, it will provide and explain the barriers to parental involvement that can prevent parents from effectively engaging in their students' education. The next chapter will also describe how parental involvement affects students' reading achievement. It will explore the quality of parental involvement activities, revealing effective strategies and practices.

Chapter 3 will introduce practical implications that draw upon the synthesized findings to offer insights for parents and educators. Policy implications will also be included in Chapter 3, which will outline programs and policies that policymakers and governing agencies can implement to provide support to increase parental involvement. By drawing conclusions from the research, Chapter 3 will suggest recommendations for enhancing parental involvement in reading and promoting students' reading achievement. For researchers, the limitations of the current study will be addressed, and the next steps for future studies will be outlined. This project intends to contribute a comprehensive understanding of the multifaceted relationship between parental involvement and elementary-aged students' reading achievement.

Chapter 2: Review of Related Literature

Introduction

Parental involvement in education is widely recognized as crucial for children's academic success, particularly in literacy. Numerous studies have shown that active parental engagement positively corresponds with higher academic achievement and motivation among students (Anthony & Ogg, 2019). Parental involvement encompasses various forms, such as fostering a supportive home learning environment, helping with homework, and attending school events. The significance of parental involvement in reading achievement stems from its impact on children's educational journeys. Parents serve as primary caregivers, role models, educators, and they shape children's attitudes and behaviors toward learning. Specifically in reading development, parental involvement creates a crucial literary environment that influences children's reading behaviors and motivations.

As elementary-aged students face critical stages in their educational journey, understanding the effects of parental involvement is important. Research consistently indicated a positive relationship between parental

involvement and academic achievement, with recent studies reaffirming this connection, particularly in reading achievement (Veas et al., 2019). Proficiency in reading is foundational for academic success, as it equips students with essential skills necessary for comprehension and critical thinking across subjects. Despite its benefits, parental involvement can face barriers, including socio-economic factors, language barriers, and time constraints. Moreover, parental involvement tends to decline as children grow older, highlighting the need for targeted interventions and support throughout their educational journey.

Parental involvement in reading has significant effects on children's reading achievement. Encouraging parents to engage in reading activities with their children, such as reading aloud, discussing stories, and creating a literacy-rich environment at home, can foster a love for reading and enhance literacy skills. Additionally, providing parents with resources and support, such as literacy workshops or access to books, can encourage them to play an active role in their children's reading development.

Research demonstrated positive academic outcomes associated with parental involvement in reading (Şengönül, 2022). Children whose parents are actively engaged in their reading education tend to exhibit higher levels of reading achievement, motivation, and comprehension. Additionally, various studies suggest that the benefits of parental involvement in reading extend beyond immediate academic gains. Children who receive consistent parental support and encouragement in reading are more likely to develop lifelong reading habits and strong literacy skills, which in turn positively impacts their academic success across subjects (Ates, 2021). The positive influence of parental involvement in reading can extend into adulthood, shaping individuals into lifelong readers. This literature review aims to identify types of parental involvement, factors affecting parental involvement, and effects of parental involvement on reading achievement.

Types of Parental Involvement

Many researchers avoid a vague definition of parental involvement and instead concentrate on various types of involvement displayed by parents (Yang & Chen, 2023). In this way, numerous types of parental involvement can be outlined. The distinction between different types of parental involvement is in the home environment or the school environment (Yang & Chen, 2023; Minseop et al., 2022). Both types of parental involvement are valuable in elementary education, as they work together to create a supportive learning environment as parental involvement at home is understood (a) to improve children's foundational skills and attitudes toward learning, (b) to reinforce the educational community, (c) enhance classroom activities, and (d) create a partnership among parents, educators, and students (Wildmon et al., 2024). Parental involvement occurring at home includes (a) creating a home learning environment, (b) promoting and modeling positive attitudes towards reading

and education, and (c) helping with homework.

Similarly, establishing a supportive home learning environment, promoting and modeling positive attitudes towards reading and education, and helping with homework sets the stage for academic success, particularly in reading, by promoting parental involvement in children's education (Shaka, 2022). This home learning environment encompasses both formal and informal interactions aimed at strengthening children's literacy skills and shaping their attitudes toward learning (Cheung et al., 2021; Dulay et al., 2019). Parents play a crucial role in providing the necessary resources and materials to reinforce what children learn in school, thus creating a supportive atmosphere conducive to learning.

Through various literacy resources, activities, and homework help, parents can actively engage their children in reading and enhance their desire to learn (Niklas et al., 2020; Szász, 2023). Parental involvement occurring at school includes parent-teacher conferences and involvement in school activities. Parental participation in parent-teacher conferences and involvement in school activities both contribute to enhancing students' academic achievement (Oh & Pomerantz, 2022). Parents can enhance their children's academic journey and promote a partnership in their children's education through various forms of parental involvement. This active engagement not only aids in their children's overall success in school but also establishes collaboration between the home and school environments.

Creating a Home Learning Environment

Creating a home learning environment is a form of parental involvement that supports academic achievement, particularly reading achievement in students. Parental involvement includes (a) designating a nurturing environment for educational activities, (b) encouraging shared reading, (c) having educational conversations, (d) explaining how to manage time, and (e) introducing various experiences (Wildmon et al., 2024). The home learning environment can include what parents do to strengthen children's literacy skills at home in addition to inspiring children's attitudes about their learning (Cheung et al., 2021). A home learning environment provides students with the necessary resources and materials to reinforce what they learn in school.

Regarding reading, the learning environment can also be considered the home literacy environment. There are two types of home literacy environment interactions: informal, which encompasses parental involvement that includes the use of printed materials, and formal, which contains parental involvement that is focused on the teaching of reading (Cheung et al., 2021; Dulay et al., 2019). Both types of parental interactions have beneficial aspects of students' reading achievement. In support of this, informal interactions were connected to the development of children's oral language skills while formal interactions were associated with the development of children's literacy skills (Cheung et al., 2021; Dulay et al., 2019). The home learning

environment, or the home literacy environment, encompasses both informal and formal interactions. These interactions serve as a crucial factor in shaping children's literacy skills, ultimately contributing to their reading achievement and overall academic success. For parents to be able to successfully engage in informal and formal literacy interactions, children need to have access to various literacy resources. When children have a higher number of home resources available and when the prevalence of learning activities is greater at home, children's literacy ability and interests rise (Cheung et al., 2021).

Many forms of literacy resources exist including (a) storybooks, (b) letter flashcards, (c) literacy workbooks, (d) board games, (e) card games, and (f) computer games that parents can provide to promote reading achievement in their children (Cheung et al., 2021). Parents who provide literacy resources to their children can enhance the opportunities for their children to interact with reading materials, which increases their children's desire to learn how to read and to improve their reading achievement (Zhang et al., 2020). Children can absorb more information, which promotes their literacy development when they have access to various types of literacy resources. This is further supported by Zhang et al. (2020), whose study demonstrated that parents who implemented literacy practices at home and provided access to literacy resources at home had students with improved reading skills. The majority of research shows a relationship between a student's home literacy environment and their language development including concepts involving print, phonological awareness, and vocabulary (Altun, 2019). Parents can enhance their children's reading achievement by offering them access to a variety of educational resources that promote literacy development.

Promoting and Modeling Positive Attitudes Toward Reading and Education

Promoting and modeling positive attitudes toward education for students is a critical form of parental involvement that encourages academic success. From the perspective of parental involvement, parental attitudes significantly shape children's attitudes and behaviors across various aspects of life, particularly in reading. Parental attitudes have a significant influence on their children, as they serve as highly influential role models. Additionally, parents shape the environment in which their children grow and learn, making parental attitudes particularly impactful on the home learning environment and children's educational experiences within this setting (Niklas et al., 2020). Research demonstrated that parental reading behaviors play a crucial role in shaping their children's reading abilities and overall academic achievement in the area of reading (Alramamneh et al., 2023). Actively engaged parents conveyed their positive reading experiences to their children and provided them with essential literacy resources, thus cultivating an environment beneficial to learning (Alramamneh et al., 2023). This highlights the significance of parental attitudes towards reading in influencing children's reading achievement.

Parental attitudes towards reading emerge as crucial factors in shaping children's reading achievement, which emphasizes parents' roles as models of their children's learning environments. Bandura (1971) proposed that individuals learn through observing and imitating the behaviors of others, especially parents. Based on this, children notice their parents' attitudes, which are likely to be imitated. Similarly, Vygotsky (1978) proposed that more knowledgeable individuals provide support to learners as they engage in challenging tasks, where children will observe parental attitudes during these interactions. Parents need to understand that their attitudes toward reading can significantly influence a child's motivation and interest in reading (Alramamneh et al., 2023). Findings from Alramamneh et al. (2023) displayed a positive relationship between parental attitudes toward reading and children's literacy skills, suggesting that children are more likely to have higher reading achievement when they have parents with positive attitudes toward reading.

Similarly, the study conducted by Niklas et al (2020) found that parental attitudes toward shared reading had a positive relationship with the home literacy environment, which was also positively related to children's linguistic abilities. Having a home learning environment that promoted positive attitudes towards education and enhanced children's reading abilities, highlighted parents' crucial role as models in their children's reading development (Alramamneh et al., 2023). The positive relationship observed between parental attitudes and children's literacy development emphasizes the importance of creating an environment that promotes positive attitudes toward education and reading.

Helping with Homework

Helping with homework is a type of parental involvement that assists in students' reading achievement. Since many parents see providing help with homework as an important aspect of parenting and as a valuable tool for students in their education, homework help is the most frequent type of home-based involvement (Grijalva-Quíñonez et al., 2020). Parents frequently engage in helping their children with homework because it is a way to support their learning journey. Szász (2023) conducted a study that analyzed parental involvement in children's homework which determined several types of parental involvement including "aversive", "ambitious", "partner", "accountable", and "networking", but the "partner" parent and the "accountable" parent were the most common. The "partner" parent allows students to complete homework independently but gives support and help when needed, while the "accountable" parent lets their child complete homework independently but only checks assignments (Szász, 2023). These types of parents are willing to be involved and are more likely to produce effective parental involvement relationships than parents who do not want to be involved with their children's education.

Moreover, helping with homework allows parents to monitor their children's progress and identify areas where they may need additional support or guidance. In addition to parental help with homework promoting academic achievement, homework assignments can increase parent-teacher communication (Bodovski et al., 2022). Providing homework help allows parents to actively engage in their children's learning process, demonstrating their support and interest in their education. This involvement can enhance communication between parents and children about school-related topics, developing a positive parent-child relationship centered around learning (Szász, 2023; Bodovski et al., 2022).

Homework can provide insights into students' progress. Homework assignments serve as a form of two-way communication between the school and the parents (Fox, 2023). When teachers assign homework, they can communicate what is being learned in school. If a child struggles with certain concepts or assignments, parents can convey these concerns to the teacher, fostering a collaborative approach to address academic challenges. Fox (2023) confirmed this in her study as she determined that her parent participants prefer homework that is bidirectional, informing parents about the material taught in the classroom and informing the teacher based on the information given by the parents. This continuous exchange of information between parents and teachers through homework assignments and homework help ensures that students receive support and guidance to enhance their learning experience.

Ultimately, parental involvement in homework can create a supportive learning environment at home that complements and enhances children's educational experiences in school. Academic achievement can be supported when parents promote self-efficacy and autonomy when students complete their homework rather than parents demonstrating control over homework which showed a negative relationship to academic achievement (Grijalva-Quiñonez et al., 2020; Bodovski et al., 2022). Findings from a study conducted by Grijalva-Quiñonez et al. (2020) concluded that for parental involvement to be the most effective for supporting academic achievement, parents should avoid (a) managing children's homework, (b) encourage independence in completing homework assignments, (c) promote children's confidence in their academic abilities, and (d) promote independent learning techniques.

Conversely, Bodovski et al. (2022) conducted a study to determine the relationship between parental help with homework and academic achievement and found no evidence that everyday homework help was beneficial for students' learning. Instead, the findings showed that promoting the importance of education is beneficial for students, compared to checking homework for accuracy and/or completion (Bodovski et al., 2022). Similar results were found by Benckwitz et al. (2023) as they concluded that parental control over homework was negatively related to students' achievement. When parents interfere

with homework in a controlling manner, it undermines student's autonomy and competence, negatively impacting academic achievement (Grijalva-Quiñonez et al., 2020; Bodovski et al., 2022; Benckwitz et al., 2023).

Parents can help their children with homework assignments, instead of checking for completion or accuracy, and they can encourage students to develop effective habits, such as self-efficacy and autonomy, which are essential for academic success, including in reading. Homework assistance facilitates ongoing communication between parents and teachers, allowing for insights into students' progress and areas requiring additional support. This parental support can contribute to building children's confidence, self-esteem, and sense of competence in their academic abilities.

Parent-Teacher Conferences

Parent-teacher conferences are another type of parental involvement that parents can participate in to increase students' reading achievement. Parent-teacher conferences play a crucial role in parental involvement by providing a direct opportunity for parents and teachers to communicate about a child's academic progress, strengths, and areas for improvement. Parents feel more effective in supporting their children's learning when they learn about their children's learning and strategies to help them during parent-teacher conferences (Oh & Pomerantz, 2022). The majority of parents of elementary-aged students attend parent-teacher conferences. In fact, 75% of parents attend parent-teacher conferences (Hanson & Pugliese, 2020). Parent-teacher conferences have the opportunity to serve as a form of communication between home and school, which can encourage parents' involvement in children's schooling. These conferences allow for the exchange of information between parents and teachers regarding a child's academic achievement.

Oh & Pomerantz (2022) conducted a study to examine information discussed during parent-teacher conferences, and it was found that teachers provided more information on each specific child than curriculum information and parent involvement information. The shared understanding of the importance of helping the student succeed allows both teachers and parents to work collaboratively to support the child's learning journey. Parent-teacher conferences encourage parents to actively engage with their child's education by providing insights into their academic strengths and needs. This involvement creates a sense of responsibility and investment in the child's learning process. For parents to feel their importance in their child's education, their child's goals, strengths, and needs should be discussed (Shaka, 2022).

Similarly, Vignjević & Pintarić (2023) conducted a study that analyzed communication during parent-teacher conferences. This study determined that most educators successfully initiated two-way communication in these conferences with parents (Vignjević & Pintarić, 2023). This communication

allows parents to be informed about their child's accomplishments, including their strengths and areas of need (Vignjević & Pintarić, 2023; Dong et al., 2020). As parents become aware of their child's progress, they can be involved in their child's educational journey. Parent-teacher conferences serve as an important path for parental involvement in education as they lead to promoting collaboration between home and school, supporting the academic achievement of students. Parent and school partnerships and collaboration have been considered an essential part of a child's education because students feel support from both school and home, encouraging them to reach their full potential (Graham-Clay, 2024).

Parent-teacher conferences support this partnership as they reinforce a line of communication between teachers and parents. Graham-Clay (2024) confirmed that conferences were arranged to review students' achievements and to discuss any concerns. In this way, parent-teacher conferences can bridge the space between the home environment and school environment by involving parents in their child's education process. Parent-teacher conferences emerge as an important type of parental involvement in education, providing parents with a direct opportunity to engage with their child's academic journey. These conferences serve as a platform for open communication between parents and teachers, fostering a shared understanding of the child's academic progress and needs.

Involvement in School Activities

Participating in school activities is another type of parental involvement that parents can partake in to increase students' achievement in school. Many parents are involved in school activities. Based on the National Center for Education Statistics, it was reported that parents participated in 6.5 school-related activities in the 2018–19 school year (Hanson & Pugliese, 2020). Of these school-related activities, the most common was attending a general school or parent-teacher organization meeting (89%), while the second most common was attending a school or class event (79%) (Hanson & Pugliese, 2020). Parental participation in school activities promotes a sense of community and collaboration between parents, teachers, and the school, creating a supportive environment for students. Parents feel they are a part of the school community when they are aware of important school information, including school events (Shaka, 2022). When parents actively engage in school activities such as volunteering in classrooms, attending school events, or participating in parent-teacher associations, they demonstrate their commitment to their child's education and contribute to a positive school environment.

In a study conducted by Echeverría-Castro et al. (2020), 49% of parents indicated that their participation in their children's school activities influenced the academic achievement of their children. However, most parents felt that they dedicated appropriate time to their children's school activities

(Echeverría-Castro et al., 2020). This involvement not only allows parents to stay informed about their child's academic progress but also provides opportunities to actively contribute to their child's educational journey. Additionally, parental participation in school activities provides opportunities for parents to stay informed and involved in their child's academic and social development. By participating in events such as parent organizations or associations, curriculum nights, or school fundraisers, parents gain valuable insights into their child's progress, classroom experiences, and school policies.

Shaka (2022) examined the strategies initiated by schools to improve parental involvement. Such strategies included (a) parenting, (b) learning at home, (c) communication, (d) volunteering, and (e) decision-making. Based on the findings, the schools that participated in the study were mostly successful in implementing these strategies. In this way, parental involvement is encouraged as families are involved in the school in various ways. Another study conducted by Mbhiza & Nkambule (2022) determined the importance of school and teacher partnerships. In this study, parents highlighted various things they can do to help their children be successful which included helping the school and participating in school activities.

From the perspective of parents, school activity involvement included helping outside the classroom (Mbhiza & Nkambule, 2022). This involvement allows parents to take on an additional role and show their children that their education is meaningful. Parents who are actively involved in school-related activities tend to have better communication with teachers and administrators (Shaka, 2022; Wildmon et al., 2024). This increased engagement allows parents to stay informed about their child's progress, strengths, and areas for improvement. With this knowledge, parents can provide additional support and guidance at home, which can positively impact academic achievement.

Factors Affecting Parental Involvement

Many studies have determined barriers to parental involvement that affect how parents participate and engage in their children's education. Unfortunately, some educators perceive race, ethnicity, and social status as factors that shape parental norms related to parents' involvement (Posey-Maddox & Haley-Lock, 2020). Various studies and research have determined numerous barriers to parental involvement. Wildmon et al. (2024) noted several parent and family factors that affect parental involvement in their study. Within the parent and family factors are current life contexts (e.g., Socioeconomic Status, educational level, culture, work) and parents' beliefs about parental involvement (Wildmon et al., 2024).

Socioeconomic status is a barrier to parental involvement by limiting financial resources and access to educational materials, which can reduce parents' ability to actively participate in their child's education (Şengönül, 2022). Parents' educational level is a barrier to parental involvement by affecting

their confidence and ability to understand and support their child's academic needs and navigate the education system effectively (Ribeiro et al., 2021). Parents' culture can also act as a barrier to parental involvement by creating differing expectations and understandings of the roles of parents and teachers in education, potentially leading to misunderstandings and reduced participation. Parents' work schedules are a barrier to parental involvement by limiting the time and energy parents have available to participate in school events and activities, assist with homework, or attend parent-teacher conferences (Minseop et al., 2022; Zilanawala & McMunn, 2023). Parents' lack of resources and lack of knowledge about effective parental involvement acts as a barrier by preventing parents from knowing how to best support their child's education and engage with teachers and school activities. It is important to be aware of these factors that can affect parental involvement as every family has different circumstances and backgrounds.

Socioeconomic Status

Socioeconomic status (SES) significantly influences parental involvement in a child's education. The reason for the absence of parental involvement is not caused by the lack of interest from parents, but instead can be caused by low socioeconomic status (Szász, 2023). Parents from lower SES backgrounds may have to work multiple jobs or irregular hours to make ends meet. This leaves them with fewer resources to participate in school-related activities or engage in their child's learning at home. Financial difficulties may result in stress and discouragement among parents, diminishing their ability to engage in parental involvement such as discussing school concerns or attending school activities (Şengönül, 2022). Many parents are expected to show their direct support of academics, be involved in the classroom, and participate in parent-teacher communication, which can be challenging to accomplish due to common barriers among low-SES families (Perrigo et al., 2022). SES barriers can impact the extent and quality of parental engagement in their child's education. Despite the socioeconomic barrier parents may face, some schools or districts concentrated on expanding the engagement of parents after the 2015 Every Student Succeeds Act (ESSA), which required that school districts must generate a policy regarding school and family engagement to receive Title 1 funds (Brown et al., 2022). Many parents still find ways to be involved and supportive of their children's education.

For example, Perrigo et al. (2022) conducted a study that found that families with lower SES defined and practiced parental involvement differently than families with middle to high SES. Parents with lower SES relied on siblings or extended family members to work around parents' limitations and help support their children academically (Perrigo et al., 2022; Maldonado Torres, 2022). Despite facing greater barriers such as limited financial resources, parents from lower SES backgrounds often find alternative means to support their children academically. Volk (2021) investigated two Latino boys from

low-income areas and showed that the families avoided stereotypes of their SES educational and economic limitations and instead created effective literacy spaces for their children.

Families from lower SES backgrounds often face greater barriers to involvement due to limited financial resources. Lower SES families may lack access to educational resources such as books, computers, or tutoring services, which can hinder their ability to support their child's academic achievement. Zhang et al. (2020) and Yang et al. (2023) concluded that parents' socioeconomic status was an indicator of the amount of literacy resources that children had access to. Parents with a higher socioeconomic status are more likely to provide access to literacy resources and engage in literacy activities with their children, which is positively related to their children's reading ability (Zhang et al., 2020; Kapengut & Noble, 2020). Families facing economic constraints may struggle to afford resources such as books or technology that help support their child's learning at home. Din et al. (2023) conducted a study that determined the significance of SES on students' academic achievement. It was found that children from higher SES backgrounds had higher academic achievement due to substantial access to resources and facilities (Din et al., 2023). Parents from higher SES backgrounds may have greater access to educational materials, extracurricular activities, and other programs that can support their child's learning.

Additionally, socioeconomic status can influence academic expectations among families. For instance, families with higher socioeconomic status often set greater educational goals for their children, allocating more resources towards promoting their academic growth while families with lower socioeconomic status may have lower educational goals due to the negative effect of poverty and limited resources (Şengönül, 2022). It was shown that parents who are more educated place a higher emphasis on education and academic achievement (Şengönül, 2022; Tan et al., 2020). Parents from higher SES backgrounds often have higher levels of education, which can lead to greater awareness of the importance of education and higher academic expectations for their children.

It is important to note that students experienced the positive effects of parental involvement (e.g., parent-child reading, academic discussions, and parental engagement in school activities) regardless of their parents' educational level (Tan et al., 2020). Şengönül (2022) verifies this as he mentioned that regardless of SES, all students benefited from parents who anticipated them to succeed in school. However, the higher SES can encourage higher academic achievement within families, shaping their expectations for their children's educational success. The meta-analysis conducted by Tan et al. (2020) noted that parents with higher SES were more involved in specific school activities (e.g., volunteering in the classroom and attending school meetings), but parents with average SES communicated with teachers more regarding their children's learning and behavior. Perrigo et al. (2022) support this as they con-

firmed that parents, regardless of their socioeconomic status, found ways to support their children that work with their limitations and abilities. Socioeconomic status plays a significant role in shaping the opportunities and constraints that parents face in their involvement in their child's education.

Parental Education Level

Parental education level can be a barrier to parental involvement in a child's education, hindering full academic potential. Parents' educational background and knowledge of education systems lead parents to their involvement roles in their students' education (Brown et al., 2022). Parents who did not have extensive education themselves might find it difficult to understand the material and expectations seen in schools. This can make it challenging for parents to effectively support their child's learning and academic achievement. There is a relationship between parents' education level and their involvement in their children's education. It was shown that parents with more education were more involved in their children's education compared to parents with less education (Oranga et al., 2022). Ribeiro et al. (2021) supported this by stating that sociodemographic factors, including higher levels of education, showed a relationship between higher levels of parental involvement.

Additionally, parents with less educational experience might be less familiar with navigating the educational system, which can hinder their ability to support their child's needs. Parents who had higher levels of education (e.g., college or graduate degree) showed the lowest barriers to parental involvement (Redford et al., 2019). This lack of engagement caused by educational barriers to involvement can limit the academic support and encouragement children receive. Parents who shared their low involvement in one study were those who had less than a high school degree (Redford et al., 2019). For some parents with lower levels of education, more time and energy are required to effectively engage in students' school activities (Ribeiro et al., 2021). Parents with higher levels of education tend to have more knowledge about the education system and may feel more confident advocating for their children's needs. As highly educated parents are more familiar with school expectations, they tend to have more confidence in discussing academic and behavioral issues (Tan et al., 2020). In this way, parents can advocate for resources to best support their child's academic achievement.

Parents may also feel intimidated by teachers and school staff, making them less likely to attend parent-teacher conferences or other school events. Besides the lack of knowledge, embarrassment related to parents' lack of knowledge was also seen as a barrier to parental involvement (Oranga et al., 2022). Higher levels of education can promote more confidence in the parents, encouraging them to be involved in their children's schooling. Parents with lower levels of education may lack confidence in their ability to help

with schoolwork, particularly as children progress to higher grades with more complex subjects. This can lead to reluctance or avoidance of involvement in homework assistance or other activities at home. Parents might feel inadequate or worry about providing incorrect information, which can discourage them from trying to help. Some studies explain that parents' level of education can determine parents' understanding of their child's capabilities which can either help or hinder their students' achievement in school (Oranga et al., 2022).

Language and Cultural Barriers

Language and cultural barriers can considerably affect parental involvement in their children's education, thus impacting their academic achievement. Certain educators or school officials assume that minority parents lack the time or interest to be involved in their children's schooling, but instead, these parents have different views on how to provide their time and energy in their children's education (Rattenborg et al., 2019; Maldonado Torres, 2022). The differences in how language and culture can impact parents' involvement in their education differ from group to group. Due to varying educational experiences, some immigrant parents are stuck between two types of parental involvement: excessive involvement or inadequate involvement (Antony-Newman, 2019). Some parents may provide excessive involvement, which hinders academic achievement by providing too much support. Other parents may provide inadequate involvement, which hinders academic achievement by providing not enough educational support.

Language and cultural differences can create barriers to involvement. For instance, if parents speak a different language than the teacher or the administrators, it will be hard for both parties to communicate with each other, hindering parental involvement in students' education. Similarly, if school practices and expectations are based on a cultural norm that is different from the parents' culture, it can lead to misunderstandings and reduced participation. Parents who do not speak the dominant language of the school may struggle to understand school communications, participate in meetings, or help with homework, which can lead to feelings of isolation and frustration. Many parents see the language barrier as an obstacle that prevents them from being able to be involved in their children's education (Maldonado Torres, 2022). Many immigrant groups (e.g., Latino, Chinese, Greek, Jewish, or parents from France and the Netherlands, or Austria, France, and Sweden) found that their inclusion in the racial minority hindered their communication with schools where parents did not feel included in their child's education or felt the inability to advocate for their children (Antony-Newman, 2019). Regardless of their culture, many parents have felt as though their backgrounds influence their parental involvement either through perception or implementation.

Parents from different cultural backgrounds may have varying

expectations about the roles of teachers and parents in education. For instance, some cultures view education as solely the school's responsibility, leading parents to be less involved in school activities. Numerous studies indicated that a significant factor in expectations for children's academic achievement was parents' ethnicity (Williams-Johnson & Gonzalez-DeHass, 2022). Other research noted that within all ethnically diverse groups, existed noticeable factors of parental involvement including role construction and parents' efficacy beliefs (Williams-Johnson & Gonzalez-DeHass, 2022). How parents perceive their roles in their children's education and if they see themselves as effectively supporting their children impacts their involvement.

Parental involvement for Latinos revolves around life lessons and how those lessons impact their children's academic achievement (Maldonado Torres, 2022). From the Latinos' perspective, education is seen as a valuable resource where education can improve their lives and increase their chances of success. Latino parents value education for their family members' future, and the consideration of their children's academic achievement is a result of the parent's success. Spanish-speaking parents had stronger goals for their children to have better lives than those experienced by the parents (Perrigo et al., 2022). Similarly, Latino parents may have their own bad experiences with their schooling and have limited knowledge of how the school system works which leads to the perception that they lack parental involvement (Maldonado Torres, 2022).

Chinese immigrant parents' often have higher expectations and greater involvement in home-based learning compared to in-school involvement (Williams-Johnson & Gonzalez-DeHass, 2022). Chinese parents also value education as parents expect children to excel in their schooling, where emphasis is specifically placed on academic training, concentration, diligence, and persistence (Cheung et al., 2021). Based on the varying differences among cultures, parents may or may not put themselves in the role of being involved in their children's education. In cultures that value collectivism and community, parents might prioritize social skills, cooperation, and emotional well-being. Their involvement may center around ensuring their children develop these attributes, which could include less direct involvement in school but more support at home.

Rattenborg et al. (2019) conducted a study that examined if families from an American Indian reservation varied from White families concerning family-school relationships. Compared to White parents, American Indian parents supported the overlapping model of family and school collaboration as American Indian parents believed that encouraging social skills was a shared responsibility, emphasizing their focus on collectivism and sharing (Rattenborg et al., 2019). Regardless of American Indian parents seeing the value of family-school partnerships, they determined schools as being unwelcoming of their involvement. American Indian parents have been discouraged by school systems from being involved in their children's education, as it was considered

harmful to their children's assimilation into the dominant culture since American Indians' emphasis on collectivism, sharing, and generosity differs from the school's focus on individual achievement (Rattenborg et al., 2019).

Different cultural attitudes toward education can influence parental involvement. Some cultures may prioritize immediate work over education, especially if the family is in financial need, leading to less emphasis on parental engagement in schooling. Other cultures may place a high value on education and view it as essential for success. Parents from these cultures are likely to be more involved in their children's schooling. Parents who have had negative experiences with education in the current educational system may feel distrustful or wary of engaging with the school. Immigrant parents have various expectations, usually different from teachers as they have diverse cultural and educational backgrounds (Antony-Newman, 2019). Many school officials describe first and second-generation families as uninvolved when they do not see the existing barriers to involvement and communication between schools, despite parents being involved in ways that are not recognized by schools (Williams-Johnson & Gonzalez-DeHass, 2022). Because of this, parents from varying cultural backgrounds may have limited involvement in their children's education.

Time Constraints

Time constraints are another barrier to parental involvement that can impact students' academic achievement. Parents who work long hours, have multiple jobs, or have demanding work schedules often have limited time to participate in school activities, help with homework, or attend parent-teacher conferences (Minseop et al., 2022; Zilanawala & McMunn, 2023). This can reduce their direct involvement in their child's education. The barrier of time constraints is seen at all socioeconomic levels, where limited parental involvement can be caused by the lack of time parents have due to their work schedules or family commitments (Graham-Clay, 2024). Possible explanations for the lack of attendance at school events or meetings are parents' jobs and other economic barriers (Posey-Maddox & Haley-Lock, 2020). Minseop et al. (2022) conducted a study that confirmed that work schedules affect parental involvement in a student's education. The study focused on maternal work schedules, which found that mothers that had weekend work showed less involvement at home compared to mothers that had weekday work (Minseop et al., 2022). Findings from this study also showed that mothers with regular daytime work schedules also had challenges with being involved in their children's education, while nonworking mothers showed the most parental involvement (Minseop et al., 2022). Fathers' nonstandard work schedules showed a negative relationship with parenting activities in children's daily routines (Zilanawala & McMunn, 2023). Parents might lack the energy and time to engage in educational activities or to provide the necessary emotional support.

Time constraints can affect the quality of interactions between parents and children. Parents who have limited time may find it difficult to engage in meaningful educational activities, such as reading together or discussing schoolwork in depth. Middle-class mothers experience challenges in directing their time between their workload and parental involvement in school (Posey-Maddox & Haley-Lock, 2020). Besides time-based conflict, work schedules can restrict the physical and emotional availability required for parental involvement. Studies show that non-standard work schedules, in particular, can cause (a) stress, (b) depression, (c) sleeping problems, and (d) fatigue (Minseop et al., 2022; Zilanawala & McMunn, 2023). These negative effects can hinder parents' ability to support academic and extracurricular activities.

School events, meetings, and activities are often scheduled during traditional working hours which can be challenging for working parents to attend. Evenings and weekends may also be occupied with work or other responsibilities, leaving little time for school-related involvement. Non-standard hours encompassing parents' work schedules have become very common where parents may have to work evening shifts, night shifts, or weekend shifts (Minseop et al., 2022; Zilanawala & McMunn, 2023). These non-standard work schedules can affect parents' involvement with their children's education. Certain home activities, such as helping with homework, can be difficult for parents to accomplish due to their evening or night work schedules (Minseop et al., 2022).

Similarly, parents experiencing weekend work schedules can hinder additional parental involvement activities, and irregular work schedules can disrupt home and school involvement because of unpredictable hours (Minseop et al., 2022). Due to time constraints, some parents may rely on extended family members, older siblings, or community programs to support their child's education. Many single parents with fixed work schedules need other family members or childcare services to be the primary contact to get to school (Posey-Maddox & Haley-Lock, 2020). While this can be beneficial, it may not fully compensate for the direct involvement of parents.

Lack of Resources or Knowledge About Effective Parental Involvement

The lack of resources or the lack of knowledge about how to effectively engage as a parent can be a barrier to parental involvement in students' education. Research has displayed that students who have access to numerous books and other educational resources are more likely to show higher academic achievement (Alramamneh et al., 2023). Research studies have also shown the significance of parental involvement activities, particularly activities pertaining to literacy, in relation to positive reading achievement (Alramamneh et al., 2023). Without knowledge of these activities, parents cannot efficiently

demonstrate parental involvement. Certain activities provide a strong foundation for reading achievement, such as storytelling, dialogic book reading between parents and children, and language-intensive interactions (Alramamneh et al., 2023). Parents' involvement in their children's education often covers a set of learned activities that are influenced by parents' backgrounds and communities, which can impact their knowledge of how to implement and change those learning activities (Brown et al., 2022). Parents have differing experiences and perceptions of the educational system based on their environments (Echeverría-Castro et al., 2020). For example, in rural environments, parents are more likely to give less support to their children in school due to their lack of education and confidence in being able to provide adequate help (Echeverría-Castro et al., 2020). When parents know how to execute effective parental involvement, they can support their students academically.

To effectively engage in parental involvement, parents need to feel confident in their role as parents capable of supplying academic support. Parents' understanding of their role in their child's education can serve as either motivators or barriers to their involvement (Posey-Maddox & Haley-Lock, 2020). Echeverría-Castro et al. (2020) conducted a study that demonstrated the varying roles that parents believe they have in their children's education. Some parents consider it their responsibility along with the school's responsibility to guarantee the academic achievement of their children, while other parents consider that responsibility to be placed solely on the school (Cheung et al., 2021). Parents often differentiate their role, which is to supply moral grounding, from the school's role, which is to provide an education (Brown et al., 2022). These differences can hinder parents from knowing another role in their child's education.

Echeverría-Castro et al. (2020) defined three roles relating to parental involvement: (a) parent-focused, where the parent is solely responsible for the education of the child, (b) school-centered roles, where the school is solely responsible for the child's education, and (c) the partnership-focused role, where parents and schools are responsible for the education of the child together (Echeverría-Castro et al., 2020). Williams-Johnson & Gonzalez-DeHass (2022) stated that a way in which parents define parental role construction is how parents determine the resources to provide to their children and how they can engage in their learning. The amount of parental involvement is usually influenced by how parents see their role in supporting their children through their education (Williams-Johnson & Gonzalez-DeHass, 2022).

Parents may not know how to effectively communicate with teachers to understand their child's academic progress and needs. They might not be aware of the best practices for engaging in parent-teacher conferences or what to ask to understand their child's performance. Parents feel more comfortable with providing help outside of the classroom because of their understanding that teachers are trained with knowledge that parents do not have (Mbhiza &

Nkambule, 2022). Parents may be hesitant to become involved or stay involved in their child's education due to the lack of knowledge that they have regarding how to effectively be involved. The ways in which the perspective of parental involvement can differ between parents and teachers include having different goals for education and having different language that is used to talk about education (Wildmon et al., 2024). Without guidance, parents might not know how to proactively seek help or resources from the school. They might wait for teachers to reach out, missing opportunities to support their child's education actively. Research has shown that when parents, in an urban elementary school, were given direct invitations from teachers, this influenced more parental involvement than parents' role construction and self-efficacy with the involvement in their child's learning (Posey-Maddox & Haley-Lock, 2020).

Parents might not be informed about available school programs, such as after-school tutoring, enrichment classes, or counseling services. Schools sometimes fail to effectively communicate these options to parents, or the information might be provided in ways that are not easily accessible to all parents. Several parents have mentioned a barrier to parental involvement is not hearing about events and activities going on in school (Redford et al., 2019). Encouraging collaboration between parents and teachers through regular communication and involvement can help parents learn and adopt effective educational strategies as well as be aware of school events and activities. When schools do not foster this collaborative environment, parents may remain unaware of the best practices.

Schools and educators can impact parents' understanding of parental involvement by demonstrating the partnership between schools and parents and inviting parents directly to engage in certain activities (Wildmon et al., 2024). Various research highlighted the significance of perceiving parents' involvement as a combination of families and school personnel developing a relationship that focused on the academic achievement of the student (Posey-Maddox & Haley-Lock, 2020). Both parents and teachers believed that family-school partnerships were necessary for children's academic achievement and stressed the importance of understanding where parents can be engaged and involved given the parents' circumstances (Posey-Maddox & Haley-Lock, 2020). Creating strong and collaborative relationships between parents and schools is crucial for ensuring that parents are well-informed and actively involved in their children's education, ultimately contributing to their academic achievement.

Effects of Parental Involvement on Reading Achievement

Parental involvement is a critical factor in improving children's reading achievement. When parents actively participate in their children's literacy development, it has a significant effect on various aspects of their reading journey. The combination of parental support and children's reading habits

creates a supportive environment that motivates children and encourages an interest in reading. This involvement not only creates a positive reading identity but also improves children's reading frequency and duration. Through active parental involvement, parents can assist in the vocabulary and language development of their children as well as their children's reading skills. Children can also experience stronger comprehension skills and strategies when their parents are involved in their education. Parents play a vital role in shaping their children's attitudes towards reading and reading skills, ultimately contributing to their overall higher academic achievement.

Increased Motivation and Interest in Reading

Parental involvement affects motivation and interest in reading among children, consequently influencing academic achievement. Reading motivation and reading skills might have a reciprocal relationship where having strong reading skills may produce more motivation and reading motivation may advance reading skills (Xia et al., 2019). Parents can help increase students' motivation to read in various ways. Parents shape children's home literacy environments, therefore playing an important role in helping their children develop reading motivation (Yang et al., 2023). Through various home literacy resources and activities, parents support their children's autonomy in reading, and they supply encouragement and promote independence and confidence (Yang et al., 2023; Araújo & Costa, 2023). Parents who are involved in their children's education and promote a nurturing home literacy environment often fill their homes with a variety of reading materials. Easy access to books and other reading resources encourages children to pick up a book and read more frequently. Yang et al. (2023) supported that parents from higher socioeconomic backgrounds have access to a variety of resources and can create a higher quality home literacy environment which can strengthen children's reading enjoyment and reduce reading boredom. Parents who read with their children, discuss books, and ask questions about what they have read help to make reading an interactive experience. Parents' participation in shared book reading has a positive relationship with children's acquisition of reading and can motivate children's reading (Kucirkova & Grøver, 2024; Niklas et al., 2020). This engagement makes reading more enjoyable and motivates children to read more.

Parents serve as primary role models in students' lives. When parents regularly read and express enthusiasm for books, they serve as role models, demonstrating that reading is an enjoyable activity. This modeling can spark children's interest in reading. Children devise reading identities through reading performances that often imitate the behaviors of more advanced readers in their lives (Wagner, 2020). Parents can demonstrate to their children the importance of reading and show reading as a fun activity. Students who experience reading for fun can develop reading habits that enable them to choose effective reading activities later (Yang et al., 2023). A review of various research has displayed that reading for fun was positively related to (a) increased

literacy skills, (b) higher reading comprehension, (c) increased vocabulary, (d) positive reading attitudes, and (e) increased reading confidence (Yang et al., 2023). Parents can increase children's motivation to read by modeling positive attitudes and enjoyment towards reading. Positive reading interactions and positive emotions about reading have been related to students' reading motivation (Xia et al., 2019). Parents can reinforce these interactions and emotions to encourage motivation even further.

Positive reinforcement from parents, such as praise and encouragement for reading efforts and achievements, can boost children's confidence and motivation to read. Along with a supportive home literacy environment, parental encouragement and praise have been related to higher reading comprehension (Xia et al., 2019). This support helps children see reading as a rewarding and valued activity. Xia et al. (2019) conducted a study that showed a direct relationship between parents' encouragement and children's reading motivation. When children feel supported and encouraged, they are more likely to develop an interest and motivation in reading. Children's motivation and interest in reading can be determined by their parents' attitudes and values towards reading and parents' involvement in their children's reading activities (Alramamneh et al., 2023). Parents' support of their child's independence can give the child more confidence in reading through parental encouragement during reading activities (Yang et al., 2023). Children can be more motivated to read when they believe that they are capable of reading. The association between parents' encouragement and children's reading motivation is moderated by children's self-concept related to reading (Xia et al., 2019). Parents have the opportunity to greatly increase their children's motivation and enthusiasm for reading by serving as role models and offering support. In turn, this can lead to the development of stronger reading habits and improved literacy skills.

Greater Reading Frequency and Duration

Parental involvement plays a critical role in increasing children's reading frequency and duration. Parents who provide a rich literary environment with a variety of appropriate books and reading materials make reading more accessible and appealing to children (Cheung et al., 2021). This encourages frequent and prolonged reading sessions. Yang et al. (2023) concluded that an active home literacy environment can promote children's reading intention by encouraging their reading enjoyment. Furthermore, children were shown to participate more in reading-related activities when they experienced more enjoyment in reading (Yang et al., 2023). When children find joy and pleasure in reading, which is influenced by the home literacy environment and parental involvement, they are more likely to read for longer durations and more frequently.

Parents who incorporated regular reading times into their daily schedules, such as bedtime stories or dedicated reading hours, helped children develop a habit of reading regularly and for extended periods (Kapengut & Noble,

2020). High reading motivation, shaped by parental encouragement, is related to increased reading time and improved ability, creating a higher reading self-concept and self-efficacy among children (Xia et al., 2019). Higher reading self-concept and self-efficacy allow children to read more often and for longer periods of time. Research has indicated that the frequency of reading activities between children and their parents is important where children who participated in reading activities at least three times per week performed better academically than children who read less than that (Araújo & Costa, 2023). Parents' views on reading and how they participated in early literacy activities played a key role in discussions among scholars, as these factors influenced how often and in what ways parents engaged in reading and language activities with their children at home (Alramamneh et al., 2023). Therefore, fostering positive parental attitudes towards reading and encouraging active involvement in early literacy activities are essential for increasing children's reading frequency and duration.

Enhanced Vocabulary and Language Development

Parental involvement considerably contributes to students' enhanced vocabulary and language development. Engaging in shared reading activities allows parents to introduce new vocabulary and concepts in context (Cheung et al., 2021). When parents read aloud to their children, they expose them to a richer, more diverse vocabulary than what they might encounter in everyday conversation. In their study, Araújo & Costa (2023) mentioned that the text included and the interactions involved through shared book reading helped children acquire more vocabulary. This practice helps children understand the meanings of new words and how to use them correctly. Other studies involving reading intervention with emphasis on students' dialogue have shown positive influences on children's learning of vocabulary (Kucirkova & Grøver, 2024).

Language and vocabulary skills can be an indicator of school readiness and academic achievement. Within their study, Niklas et al. (2020) defined language skills as the activation of word meanings, understanding sentences, receptive vocabulary, knowledge of text and sentence structures, and language production skills. Language enrichment is a potential method that can link children's home environment to their academic achievement (Kapengut & Noble, 2020). This language enrichment was related to variations in vocabulary scores and cognitive development which subsequently affected academic outcomes. The home literacy environment, which includes parental reading habits and other broad aspects of family literacy such as the collection of books in a home, was shown to be positively related to children's linguistic abilities based on parental attitudes toward shared reading (Niklas et al., 2020). These increased linguistic abilities translate to vocabulary and language development.

Access to books, educational games, and other literacy materials at home supports vocabulary development by encouraging independent reading and exploration (Cheung et al., 2021). Resources like storybooks, flashcards, and interactive apps introduce children to new words and concepts. Altun (2019) discussed various research that showed a relationship between children's language development, including phonological awareness and vocabulary, and their home literacy environment. Other research has shown that daily reading while children are young is related to children's later language and cognitive development as well as increased vocabulary (Kapengut & Noble, 2020). Parental involvement in shared reading and providing a literacy-rich home environment significantly enhances children's vocabulary and language development, which is crucial for school readiness and academic achievement.

Improved Reading Skills

Parental involvement positively impacts students' improvement of reading skills. Parents can help their children develop their understanding of reading by connecting various materials, ideas, and procedures, followed by learning complex concepts including integrating texts, letters, words, and shared readings as their experiences expand (Wagner, 2020). When parents read aloud to their children, they model fluent reading and expose children to new vocabulary and complex sentence structures. An analysis of numerous studies on the frequency of shared reading revealed that reading books together at home is linked to children's phonemic awareness, vocabulary extent, and overall reading achievement (Kapengut & Noble, 2020). This practice enhances listening skills and comprehension. Engaging children in conversations about the stories read together helps develop their critical thinking and comprehension skills. Studies have shown that home-book reading when a child is young is positively related to the increase in children's reading performance later in elementary school (Araújo & Costa, 2023).

Providing a variety of books and other reading materials at home encourages children to read more often. A home filled with books, magazines, and newspapers offers children opportunities to practice reading, which is crucial for developing their reading skills. Parents increase their children's chances of working with written symbols, which leads to improved reading skills, by supplying them with such printed materials (Zhang et al., 2019). Establishing a quiet, comfortable space for reading can help children focus and enjoy their reading time, promoting consistent reading habits. Parents who encourage their children to choose books that interest them can help foster a lifelong love for reading (Cheung et al., 2021). Children reading for pleasure are more likely to read frequently, improving their reading skills over time. Establishing a family reading time where everyone reads together can reinforce the importance of reading and provide a shared activity that promotes literacy. Children often imitate their parents' behaviors (Bandura, 1971; Vygotsky, 1978). Parents

who have high expectations for their children's achievement were related to higher reading scores (Iroegbu & Igweike, 2020; Zhang et al., 2019). Thus, when parents demonstrate a positive attitude towards reading and have high expectations, they model a good example for their children and foster the improvement of reading skills.

Parents who communicate with their child's teachers and participate in school reading programs can better understand their child's reading progress and areas of improvement. Information regarding student activities, projects, assignments, and individual concerns and progress are expressed to parents through various forms of communication (Graham-Clay, 2024). This communication between parents and teachers plays an important role in the improvement of children's reading skills. Moreover, encouraging children to complete their school reading assignments and discussing these assignments with them can reinforce the skills learned at school (Oh & Pomerantz, 2022). Book reading in high frequencies has been shown to improve reading scores on the Program for International Reading Literacy Study and the Program for International Student Assessment (Araújo & Costa, 2023). Parents can greatly improve their child's reading abilities by actively participating in their child's reading and maintaining communication with teachers.

Stronger Comprehension Strategies

Parental involvement plays a crucial role in the development of students' comprehension strategies. The environment that parents create for their children can influence their development of reading comprehension. Dong et al. (2020) and Çalışkan & Ulaş (2022) conducted studies that showed a positive relationship between the home literacy environment and children's reading comprehension. Creating a supportive environment at home that is conducive to learning, such as a dedicated reading space, allows children to focus and engage more deeply with the texts provided. Niklas et al. (2020) found that children's home literacy environment, especially those in their early years, was a key indicator for children's increased language skills and language comprehension. Zhang et al. (2019) conveyed that formal literacy experiences enhance reading comprehension through letter knowledge, while informal literacy experiences do not significantly impact early literacy skills and reading outcomes. Formal literacy activities are those that directly involve the teaching of letters, words, or other activities involving print. Informal literacy activities on the other hand indirectly expose children to print in activities including shared reading. Exposure to literacy resources improves reading comprehension through rapid naming, phonological awareness, and vocabulary (Zhang et al., 2019). When parents read with their children and expose them to formal literacy activities and literacy resources and think aloud about the text, they can also model effective comprehension strategies.

Providing a range of books and reading materials that cater to

children's interests and reading levels can motivate them to read more. Zhang et al. (2019) discovered that children's access to literary resources was positively related to literacy skills including word reading and reading comprehension. However, the findings from Dong et al. (2020) indicated that children's reading comprehension was influenced more by parental literacy involvement than by home literacy resources. Parents can encourage their children to read to help increase their motivation to read for fun. A review of research conducted by Yang et al. (2023) demonstrated that text comprehension and reading attainment were positively related to reading for pleasure. Similarly, reading motivation and parents' praise or encouragement have been presented to be related to children's reading comprehension and academic achievement (Xia et al., 2019). However, while motivation may affect children's comprehension, Dong et al. (2020) showed that language comprehension and decoding ability had a closer relationship than motivation had on reading comprehension. Engaging children in different reading-related activities, such as reading aloud, silent reading, and group reading, can help reinforce comprehension strategies in various contexts.

Higher Academic Achievement

Parental involvement has a meaningful impact on student's overall academic achievement. Studies consistently show that children with involved parents tend to achieve higher grades and perform better on standardized tests (Dong et al., 2020). This is attributed to the support and encouragement parents provide, which helps children stay focused and motivated. Research has shown that home-based and school-based parental involvement positively affects children's academic achievement, including reading scores and overall GPA (Anthony & Ogg, 2019). A home environment rich in literacy resources, combined with parents' engagement in school activities, provides a comprehensive learning environment. This combination helps reinforce what is learned at school and supports continuous learning at home. Parents' interactions of encouragement, literacy activities, and emotional support are more likely to enhance children's literacy knowledge development therefore enhancing academic achievement (Dong et al., 2020).

Parental involvement causes the recognition of children's strengths and needs. Parents' involvement in the home and school settings showed positive relationships with students' engagement, motivation, and academic achievement (Barger et al., 2019). When parents are more engaged in their children's education, their involvement often leads to more frequent and effective communication about their child's development and achievement. This communication helps parents stay informed about their children's progress and any issues that may arise, allowing for timely interventions and support. Studies have shown that parents' communication and their receptivity to their children's needs are positively related to students' academic achievement (Alramamneh et al., 2023; Grijalva-Quiñonez et al., 2020; Yang et al., 2023). Active

parental involvement allows for better communication between parents, teachers, and children, encouraging consistent support.

Compared to direct learning involvement, other forms of parental involvement can have significant effects on students' academic achievement. Parents' emotional participation in the study conducted by Liang et al. (2019) showed a positive relationship with the test scores of the children tested in the study. Similarly in this study, parents' cultural participation also conveyed a positive influence on students' test scores (Liang et al., 2019). In this way, parental support for the child's needs and interests can relate to higher academic achievement. Involved parents tend to set higher educational expectations for their children. The modeling of expectations helps children understand the importance of education and strive for academic success (Williams-Johnson & Gonzalez-DeHass, 2022; Zhang et al., 2019). In one study, parental expectations had the largest influence on students' academic achievement, indicating that parents' positive attitudes affect children's confidence when completing academic tasks (Veas et al., 2019). Parental involvement creates a positive attitude towards school and learning, thus helping students reach higher academic achievement goals.

Summary

Several types of parental involvement have been identified in previous literature. These include creating a home learning environment, promoting and modeling positive attitudes towards education, helping with homework, parent-teacher conferences, and involvement in school activities. Creating a home learning environment is a key form of parental involvement that supports academic achievement, particularly in reading. This involves providing a nurturing space for educational activities, encouraging shared reading, and engaging in educational conversations. In addition to creating a home learning environment, parents can provide various literacy resources, such as storybooks and educational games, to support their children's literacy development. Research indicates that children with access to diverse literacy resources at home tend to have better reading achievement and overall academic success (Alramamneh et al., 2023). Promoting and modeling positive attitudes toward reading and education significantly influence children's academic outcomes. Parents' attitudes and behaviors serve as powerful models for their children, fostering a supportive learning environment at home. Parental involvement, such as shared reading and providing literacy resources, helps cultivate a positive attitude towards education in children. Helping with homework is another form of parental involvement that can boost reading achievement. Effective parental involvement in homework includes supporting children's independence and self-efficacy rather than controlling the process. This approach helps children develop confidence and competence in their academic abilities. Homework also facilitates communication between parents and teachers, providing insights into students' progress and areas needing support. Parents

and teachers can also maintain effective communication about students' academic progress through parent-teacher conferences. These meetings help parents understand their child's strengths and areas for improvement, fostering collaboration between home and school to support the child's educational journey. Participating in school activities further enhances parental involvement and contributes to a supportive educational environment. Active participation in events like parent-teacher organization meetings and school events helps parents stay informed and involved in their child's academic and social development. This involvement promotes a sense of community and collaboration, reinforcing the importance of education to children and supporting their academic achievement.

Several barriers to parental involvement have been identified in previous literature including socioeconomic status, parental education level, language and cultural barriers, time constraints, and lack of resources or knowledge. These barriers impact parental involvement in children's education and, thus, their subsequent academic achievement. For families with lower socioeconomic status, the need to work multiple jobs or irregular hours can result in less time and fewer resources available for engaging in their child's education. Financial difficulties can also cause stress and discourage parental involvement. In contrast, higher SES families are more likely to provide direct support and resources, such as tutoring and books. Parents with higher education levels are more likely to be involved in their child's education, as they have a better understanding of the educational system and feel more confident in supporting their child. Lower education levels can lead to parents feeling intimidated by school staff and less capable of helping with schoolwork, while higher-educated parents advocate more effectively for their child's needs. Language differences can hinder communication between parents and schools, leading to reduced parental involvement. Cultural differences in views on parental roles in education can lead to misunderstandings and varying levels of involvement. Negative past experiences with the educational system can cause distrust and reduced engagement from immigrant parents. Parents working long hours or non-standard schedules have limited time for school involvement and supporting homework. Stress and fatigue from demanding work schedules can affect the quality of parental engagement. School events often conflict with parents' work schedules, leading to lower participation. Parents may lack knowledge about effective parental involvement activities, such as literacy-related practices. Differing perceptions of parental roles can impact involvement levels. The lack of awareness about school programs and resources can limit parents' ability to support their child's education. Overall, these factors illustrate the barriers that affect parental involvement in education, highlighting the need for supportive measures to engage all parents effectively.

The involvement of parents is essential in improving various aspects of children's reading, including their reading achievement and overall academic

success. These aspects include children's motivation and interest in reading, the frequency and duration of reading, vocabulary and language development, reading skills, comprehension, and overall academic achievement. Parental involvement significantly boosts children's motivation and interest in reading, promoting academic achievement. This relationship is reciprocal: strong reading skills enhance motivation, and increased motivation enhances reading skills. Parents shape children's home literacy environments, encouraging reading motivation through support, encouragement, and autonomy in reading. A rich literary environment at home, filled with appropriate books and reading materials, makes reading more accessible and appealing. Regular reading routines and encouragement from parents promote consistent reading habits, leading to longer and more frequent reading sessions. Positive parental attitudes towards reading and active involvement in early literacy activities are essential for increasing children's reading frequency and duration. Parental involvement in shared reading activities also introduces children to new vocabulary and concepts in context, enriching their language skills. A home literacy environment with access to various reading materials supports independent reading and vocabulary development. Parents enhance children's reading skills by modeling fluent reading, providing diverse reading materials, and engaging in discussions about texts. Parents' positive attitudes and high expectations for reading achievement encourage the improvement of reading skills. Access to literacy resources and engagement in reading-related activities also enhance comprehension strategies. Encouraging reading for pleasure and providing positive reinforcement boosts reading comprehension, contributing to overall academic achievement. Parental involvement leads to higher academic achievement through consistent support and encouragement. A comprehensive learning environment at home, combined with engagement in school activities, reinforces continuous learning. Active parental involvement improves communication between parents, teachers, and children, facilitating timely support and interventions. Ultimately, the active involvement of parents in their children's reading journey leads to significant long-term benefits, especially in reading achievement. The following chapter will express practical and policy implications, address the limitations of this research, and provide recommendations for future studies.

Chapter 3: Implications

Introduction

The limited or lack of parental involvement in a child's education can hinder students' academic success. Since parental involvement is positively related to academic performance, understanding the impact of different levels and types of parental involvement on reading achievement is important. Research shows that parental involvement plays a significant role in reading proficiency, which is strongly linked to future academic success (Anthony &

Ogg, 2019; Auerbach, 2019; Çalışkan & Ulaş, 2022; Liang et al., 2019). By identifying how parental involvement affects educational outcomes, strategies can be developed to promote equity in education and improve reading achievement among elementary-aged students, therefore highlighting the importance of parental involvement in academic and reading achievement.

The purpose of this research project was to investigate the influence of parental involvement on the reading achievement of elementary-aged students. This study aimed to explore the various forms and levels of parental involvement, focusing on both the quantity and quality of activities and practices. It examined specific components of effective parental involvement, such as the quality of parent-child interactions and the amount of support provided for reading development. Additionally, this project identified various barriers to parental involvement that can prevent parents from engaging in their children's education. By reviewing current studies, this research determined the impact of parental involvement on students' education and the effects it has on students' reading achievement. The findings provided guidance on effective strategies to support children's learning and to strengthen parent-school partnerships.

Conclusions

The literature review displayed that parental involvement had positive effects on students' academic success. One conclusion from the literature review is that both home-based and school-based parental involvement are crucial for enhancing children's academic achievement, particularly in reading. The strength and impact of parental involvement varies depending on the type of parental involvement, but all forms display positive effects in differing ways (Wildmon et al., 2024). By creating a supportive home learning environment, promoting positive attitudes toward education, helping with homework, participating in parent-teacher conferences, and engaging in school activities, parents can significantly contribute to their children's educational success. This involvement fosters a collaborative partnership between home and school, ultimately supporting students' overall academic development. Rattenborg et al. (2019) stated that parental engagement is an important measure of the home and school partnership and that these partnerships provide students with opportunities for academic success.

The research also indicated barriers to parental involvement that hinder parents' engagement in their children's educational journey. Another conclusion from the literature review is that addressing barriers to parental involvement requires a collaborative effort between parents, schools, and communities to create supportive environments that recognize and accommodate diverse family situations and experiences. Socioeconomic status, educational level, culture, work schedules, and a lack of knowledge and resources are significant barriers to parental involvement in children's education, affecting how parents engage and support their children's academic achievement.

These barriers can limit parents' ability to participate actively in school activities, assist with homework, and effectively communicate with educators, which can impact students' academic success. Wildmon et al. (2024) noted several factors that hinder parental involvement. Table 1 distinguishes these factors that schools should address to increase parental participation (Wildmon et al., 2024).

Table 1

Individual Parent and Family Factors

Individual parent and family factors	Traditional school context (Hornby & Lafaele, 2011)	School Action	Category of PI support
Parents' beliefs about PI	If a parent believes it is their job "only to get their children to school," they are less likely to be involved in home-based or school-based PI.	Communicate that education is a partnership between home and school.	Communicate
Perceptions of invitations for PI	Parents' perceptions of the teacher's or school's openness to PI encourage or discourage PI.	Directly invite parents for specific PI activities.	Partner
Current life contexts	Parent education level, work, and career situations encourage or discourage PI.	Support PI activities that recognize the reality of some family contexts.	Support
Class, ethnicity, and gender	SES, ethnicity, and gender serve to encourage or discourage PI. There are disparities based on each. Some groups have less time; others have less trust. Women are more likely to engage in PI.	Encourage and support PI with all parents.	Encourage

Note. Retrieved from "Identifying and navigating the barriers of parental involvement in early childhood education" by M. E. Wildmon, K. V. Anthony, & Z. J. Kamau, 2024, *Current Issues in Education*, 25(1), 6-7.

This project determined the impact of parental involvement on students' reading achievement. A final conclusion from the literature review is that parental involvement plays a critical role in enhancing children's reading achievement. Veas et al. (2019) mentioned that parent and child interactions

are needed for students to show academic success. Parents contribute to a supportive and enriching home literacy environment that fosters children's interest and confidence in reading, leading to improved literacy outcomes and academic success. Active parental participation in literacy activities positively impacts children's motivation, reading frequency and duration, vocabulary and language development, reading skills, comprehension strategies, and overall academic achievement.

Practice Implications

After consideration of the research and findings, several practical implications exist. One recommendation is that schools and educators foster a strong partnership between home and school. Teachers should actively encourage and facilitate parental involvement in various forms, both at home and within the school environment, to enhance students' academic achievement and develop a partnership between educators and parents. Teachers can establish consistent communication channels, such as emails, newsletters, or apps, to keep parents informed about their child's progress and school events. Realistic parental expectations and flexible communication between schools and families contribute to parental engagement (Veas et al., 2019). Teachers can also provide parents with guidelines, resources, or activities to help them support their children with homework and study routines. Wildmon et al. (2024) recommended that teachers focus on improving home-based parental involvement by encouraging and supporting home-based activities. Such activities include reading and learning activities or taking their children to the park, playground, or store (Wildmon et al., 2024). There are also several ways in which teachers can encourage parental involvement within the school environment. Parents can be invited to volunteer in the classroom, on field trips, or at school events. This involvement helps parents feel more connected to the school community. Teachers can schedule regular meetings, such as parent-teacher conferences, to discuss the student's progress and ways parents can support learning at home. Parents should be encouraged to join school committees or parent-teacher associations to participate in decision-making processes and be invited to school events.

An additional implication determined from the project's findings is that various strategies should be implemented to engage parents in the literacy process. This means creating opportunities for parents to actively participate in their child's reading development. Educational activities can be shared with parents that they can do with their children at home, such as reading together. Similarly, home reading programs can be supported by providing reading logs, book bags, or online reading resources for students to take home. Compared to completing dull tasks, parents prefer to help with lessons or activities that require parental interaction (Rattenborg et al., 2019). Teachers can set goals and offer incentives for consistent reading habits. Educators can help create a supportive literacy environment that actively involves parents in their child-

ren's reading development, leading to improved reading achievement through the implementation of these strategies.

A final implication is that educators and schools should develop strategies to reach and support parents from different backgrounds. Teachers should approach parental involvement with cultural sensitivity. The diverse cultural backgrounds of families need to be recognized and respected, and materials should be provided in multiple languages if needed. Teachers can build strong relationships with parents through regular, positive interactions, not just during times of concern. Parents should be given the space and the opportunity to give feedback and share their concerns or suggestions for improvement. The way parents are involved in their children's education is determined by the role they perceive and the strategies they find helpful (Hill, 2022). By implementing these strategies, teachers can foster a collaborative environment where parents feel empowered and equipped to contribute to their children's educational success.

Policy Implications

Districts and governing authorities can consider implementing various programs to help increase parental involvement. One of these programs includes parental engagement programs. Brown et al. (2022) noted that the Every Student Succeeds Act made it so that districts receiving Title 1 funds must also have a policy in place that targets family and school engagement. With this in mind, Title 1 schools should have parental engagement programs in place. However, non-Title 1 schools do not have to comply with this policy. All schools should implement a parental engagement program to boost parental involvement. Within these parental engagement programs, school-parent partnerships should be mandated. Bryce et al. (2019) acknowledged the importance of giving children direct parental support in their education to promote their academic achievement. Parents may not know about the types of parental involvement, the roles they can take inside and outside of the school environment, or the impact their involvement has on their child's education (Bryce et al., 2019). Therefore, parental engagement programs can be utilized by teachers and help parents learn about their important roles in their students' lives. Schools can establish formal programs that facilitate regular communication and collaboration between teachers and parents.

Another policy implication is that additional funding should be allocated to provide the necessary resources and support for families. Funds can be spent on family literacy programs or literacy workshops. Governing authorities should ensure that schools have the necessary funding to offer workshops and training sessions that educate parents on how to support their children's reading at home. The Every Student Succeeds Act, as described by Brown et al. (2022), requires that local education agencies must supply funds to assist schools with parent and family engagement programs. Despite this, limited

Despite this, limited funding is applied to such programs and assistance. Extra funding can help provide literacy materials to parents and students. Programs should be funded that distribute books and reading materials to families, particularly in low-income communities, to create home libraries.

A third policy implication is that professional development for educators should be enhanced. One focus of professional development can be training on family engagement. Professional development for teachers on effective strategies for engaging families in their children's literacy development should be required. If teachers become successful in promoting family engagement, all groups will be helped. Within the case of parental involvement, students gain improvements in their academic achievement, and teachers gain more support from the students' parents (Ates et al., 2021). Another focus of professional development can be cultural training. Both schools and families should strive to empathize with each other (Ates et al., 2021). Training can be provided to help teachers understand and respect diverse family backgrounds and how these can be used to support literacy.

Directions for Future Study

It is important to note the limitations of this project. One significant limitation to consider is the generalizability of findings across different cultural and socioeconomic contexts. Within the limitation is the cultural variability. The studies discussed how cultural norms and expectations significantly influence parental involvement. For example, Latino and Chinese cultures may prioritize different forms of parental engagement compared to Western cultures. However, many studies predominantly focus on Western or specific cultural contexts (e.g., American and European), which limits the generalizability of findings to other cultural groups (Antony-Newman, 2019; Maldonado Torres, 2022). Also within the generalizability are socioeconomic differences. SES also plays a critical role in parental involvement, affecting access to resources, educational expectations, and time availability. Yet, studies often categorize SES broadly or focus primarily on low-income families, potentially overlooking the variability within higher SES families or different socioeconomic contexts globally (Şengönül, 2022; Din et al., 2023).

Another limitation of this project is the methodological considerations. The methodologies used in the studies vary, from qualitative interviews to quantitative surveys, which can affect the interpretation and comparison of results across different studies. Cultural insights and diversity within socioeconomic categories may not be fully captured due to methodological constraints or biases in sampling (Rattenborg et al., 2019; Wildmon et al., 2024).

Further research can be conducted to advance the information on parental involvement. One factor to consider regarding parental involvement is technology. Digital technologies can be investigated and how online resources can be used to enhance parental involvement in children's literacy develop-

ment. This includes examining the impact of digital platforms on parental behaviors and their influence on children's reading habits and skills. Another important factor to further research is intervention studies. Intervention studies can be used to assess the effectiveness of specific parental involvement programs or strategies designed to enhance children's reading skills. Comparing different types of interventions and their outcomes could provide evidence-based recommendations for schools and families aiming to improve reading achievement through parental engagement. Conducting longitudinal studies is another recommendation for future research which can help provide more in-depth insight into the impact of parental involvement on elementary-aged students' reading achievement. Longitudinal studies can be conducted that track children from early childhood through adolescence to examine how continuous parental involvement impacts reading achievement over time. This approach would provide insights into the long-term effects of different types and levels of parental involvement on various aspects of reading skills, motivation, and academic achievement.

Summary

Parental involvement is positively related to students' academic performance, particularly in reading. Effective strategies for involving parents are crucial to avoid academic underachievement and disparities in educational outcomes. Home-based involvement and school-based involvement create a collaborative partnership between home and school, supporting students' academic development. Socioeconomic status, educational level, cultural differences, work schedules, and lack of knowledge/resources act as barriers that can limit active participation in school activities and effective communication with educators, impacting students' success. Parental involvement enhances children's reading skills by creating a supportive home literacy environment. Active participation in literacy activities boosts children's motivation, reading frequency, vocabulary, language development, and comprehension strategies.

In the classroom, teachers should encourage and facilitate parental involvement both at home and school. Various strategies can also be implemented to reach and support parents from various backgrounds. Teachers can also develop opportunities for parents to participate in their child's reading development. At the local, state, and national level, parental engagement programs should be developed. Formal programs can be established for regular communication and collaboration between teachers and parents. Additional funds should be allocated for literacy workshops and training sessions so that literacy programs are well supported. Literacy materials can be provided to create home libraries, especially in low-income communities. Professional development for educators can also be created and enhanced. Teachers can be trained on family engagement strategies and how to respect diverse family backgrounds.

While the existing research provides valuable insights into the

importance of parental involvement in education, addressing limitations through more diverse research methods and considering broader contexts could enhance our understanding of its true impact on student achievement. The research conducted produced generalized findings on cultural and socioeconomic contexts. Cultural norms significantly influence parental involvement, and most studies focused on Western contexts. Some studies also overlooked variability within higher SES families and different global contexts. Variations in methodologies affect the interpretation and comparison of results across studies. For future research, the use of digital technologies to enhance parental involvement in literacy development should be investigated. The effectiveness of specific parental involvement programs or strategies can also be assessed. Similarly, the long-term impact of sustained parental involvement on reading achievement can be examined. With the findings of this research, in addition to future studies, a comprehensive understanding of how parental involvement impacts elementary-aged students' reading achievement can be developed. This understanding can help parents and teachers encourage additional support to help students be successful in their academic endeavors.

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The Impact of Early and Universal Dyslexia Screening (PK-3) on Reading Achievement of Third Grade Students

Wendy Maria Sickler

Abstract

The most crucial predictor of future academic achievement is a child's capacity to read at grade level standards by the third grade. Dyslexia, a specific learning disability, is characterized by an unexpected struggle in learning to read. Children with dyslexia often go unnoticed or undiagnosed in their early school years. This research project investigates the impact of early and universal dyslexia screening (PK-3) on the reading achievement of third grade students. Additionally, the literature review explores the quest for a universal definition of dyslexia, as well as examines universal screening tools approved in the states of Ohio, Tennessee, and Texas. Findings indicate that early and universal screening is widely accepted as a crucial first step in providing students with the direct and explicit instruction necessary for reading success. Additionally, the implementation of universal screening for dyslexia and comprehensive literacy strategies in the states of Tennessee and Texas has led to notable improvements in third grade reading scores. However, attributing changes in reading scores solely to dyslexia screening remains challenging. A significant study by the American Psychological Association suggested a moderate relationship between universal screening in kindergarten and associated third grade standardized reading scores. As more states, such as California, implement universal screening in the 2024-2025 school year, further research into its impact on third grade reading scores will be beneficial. Significant implications to policy and classroom practice emerge when a state mandates early and universal screening. The research identifies teacher training and professional development, school policies for screening benchmarks, and financial expenditures for screening as key factors affecting schools as a result of early and universal screening.

Chapter 1: Introduction to the Project

Background

The capacity of a child to read at the expected grade level standards by third grade is the most significant indicator of their future academic success. More specifically, if a child is reading proficiently by the end of third grade, they are four times more likely to graduate from high school than their classmate who struggles with reading (Hernandez, 2011). When a child is falling behind in reading, they risk falling further behind in every other subject. While

it is widely acknowledged in the field of education that high-quality initial instruction is crucial for reading success, various factors can impede children from developing strong reading skills.

One specific learning disability that impacts reading is dyslexia. Dyslexia is characterized by an unexpected difficulty in learning to read. Research from the National Institutes of Health and Yale University suggests that 20% of school aged children are affected by this learning disability (Wagner et al., 2020). Children who have dyslexia can often go unnoticed or un-diagnosed as having a learning disability in their early school years. Children with dyslexia do not present with any distinguishing physical features, and they often maintain a high Intelligence Quotient (IQ) and test well orally. A dyslexic child in class may not always appear to be behind enough to require special help. However, there is generally a sense that something is off or a student is falling behind. This disability can also impact a student in such a way that he or she could be described as lazy, reckless, immature, or their effort as not trying hard enough or having behavioral problems. Meanwhile, there is a legitimate difference in the child's cognitive functioning that is preventing learning growth. Dyslexia is recognized as a specific learning disability under the Individuals with Disabilities in Education Act. Recognizing possible indications of dyslexia and formally requesting appropriate testing and evaluation for a student is often left to parents and classroom teachers. In many instances, educators and parents are urged by school administration to take a wait and see approach, and students are left undiagnosed. During the critical Pre-K to grade three reading instruction years, students with undiagnosed dyslexia struggle to learn and suffer the consequences academically and emotionally.

Early identification of dyslexia and making required accommodations for students has come to the forefront in education over the past several decades. This issue came into the spotlight for many reasons, a significant one being that a group of parents in an Upper Arlington, Ohio school district united together in 2010, recognizing that their children with dyslexia were not getting the direct and explicit phonics instruction needed (Hanford, 2017a). This group of parents united to address the lack of direct and explicit instruction for their children with dyslexia, filing a lawsuit against the Upper Arlington School District on behalf of their children. In August 2011, the Ohio Department of Education found the Upper Arlington Schools in violation of federal and state law when it came to promptly and properly identifying students with learning disabilities and finding them eligible for special education. This ruling was a key component driving an emphasis on early and universal screening for dyslexia. Recently, California joined 40 other states in mandating dyslexia screening for kindergarten through second grade students (Heubeck, 2023). Although many states now mandate early screening for dyslexia, there is confusion about the nature of screening versus diagnostic assessment. Thus, reliable and valid early predictive screening measures are needed. (Fletcher et al., 2020).

One of the challenges with early dyslexia screening is the lack of a universal definition of dyslexia agreed upon by various parties (Miciak et al., 2020). A universal definition drives many critical factors, including elements to be measured in universal screening. Parents, educators, and the public in general have an idea of what dyslexia is, but the average person would likely not know key elements required to identify and support these students. Strides are being made to align institutions on a universal definition of dyslexia. The International Dyslexia Association (IDA) provides the following definition, which was adopted by the United States National Institutes of Child Health and Human Development (Lyon et al., 2023). This definition has been widely cited by researchers and educators and is currently included in many state education codes, including those of Washington, Arkansas, New Jersey, and Ohio (California Dyslexia Guidelines, 2017). The definition is as follows:

Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge. (California Dyslexia Guidelines, 2017)

Experts agree that key characteristics indicating a diagnosis of dyslexia include difficulties with word recognition, spelling, and decoding. These difficulties can be noticed in young learners (PK-1) when they present as deficits in the phonological component of language - students may lack phonemic awareness and struggle with differentiating sounds. In a study published in *The Journal of Pediatrics*, Ferrer et al. (2015) shows that the achievement gap between students with dyslexia and typical readers is evident as early as first grade. The study emphasizes the importance of early identification of students with dyslexia, and concludes by saying that, "Implementing effective reading programs as early as kindergarten or even preschool offers the potential to close the achievement gap" (Ferrer et al., 2015, p.1).

Despite the visibility given to dyslexia and the research done to further define and understand this specific learning disability, there remains a significant amount of pushback on early universal screening (Jones, 2022). For instance, in 2021 when California first attempted to pass a bill mandating early screening for dyslexia, the bill died in the Assembly Education Committee before lawmakers even discussed it (Jones, 2022). The drive to identify children with dyslexia came to a halt due to the power of the state's teachers' union. The California Teachers Association has been one of the strongest opponents of dyslexia screening, saying children learn to read at their own pace and flag-

ging potential learning disorders could railroad some students, especially English learners, unnecessarily into special education (Jones, 2022). Meanwhile, thousands of students continue to struggle with the basics of literacy, falling further and further behind because there is no process to screen every child, dyslexia advocates say (Jones, 2022). Literacy advocates spoke up and continued to make their voices known on this issue. Maryanne Wolf, professor in residence at UCLA's Graduate School of Education and director of the school's Center for Dyslexia, Diverse Learners and Social Justice described the situation as "urgent." Wolf (2022) articulates that,

Screening is not a diagnosis or a ramp to special education. Rather, it gives teachers information on strengths and weaknesses of every child so that early targeted instruction can give children their best shot at becoming literate. Every time a child is not realizing their potential is a loss to society, economically and in every other way. ... The stakes are so high.

We cannot continue to let this happen. (Jones, 2022, para. 17)

Despite continued pushback from the teachers' union, another bill was introduced on this same topic. On July 10, 2023, Governor Newsom signed Senate Bill 114 into law. The new law took effect January 1, 2024. The bill specifically adds Education Code Section 53008, entitled Screening for Risk of Reading Difficulties, which outlines new requirements for the State Board of Education as well as Local Educational Agencies (LEAs).

Statement of the Problem

Without early and effective universal screening tools in place, students with undiagnosed dyslexia are at risk for underachievement, dropout, and mental health problems. Research reveals that dyslexia affects 20% of school-age children, indicating a significant population of students needing direct and explicit instructional methods to learn how to read (Wagner et al., 2020). However, many students may advance to second grade without being screened for dyslexia or other specific reading/learning disabilities. By the time students reach second grade, the critical reading instructional years are over. From second grade and forward, public schools are reading to learn vs. learning to read. As demands of the educational standards increase significantly, students without solid reading skills fall behind at a rapid rate. Students with dyslexia can no longer keep up with typical peers because they have not received the direct and explicit instruction required. These students suffer the consequences academically and emotionally. Educators must do their part to identify and support all students' needs, particularly those that need targeted intervention for reading at an early age. If this problem is not addressed, students with undiagnosed dyslexia are at risk for underachievement, dropout, and mental health problems.

Purpose of the Project

The purpose of this project is to assess the impact of early dyslexia screening (PK-3) on reading achievement of third grade students. Early and universal screening for dyslexia is mandated in 41 states (Heubeck, 2023), underscoring the broadly recognized imperative to identify and support students during their formative years of reading instruction. For schools that have had early screening in place, what do their reading achievement scores show? What is the best practice for universal screening tools and implementation? This project will investigate data seeking to understand the following: when early screening is in place, are the majority of students reading at grade level by the time they reach third grade? Early screening to identify dyslexia, followed by direct and explicit instruction for students who meet the criteria, is a widely accepted practice to support these students. If this problem is not addressed, educators may be committing time and financial resources to measures that are not making gains for students. If educators miss the mark on addressing student needs, there is significant risk of failing to help students in the most important predictor of future success — reading.

Theoretical Framework of the Project

The theoretical framework for this research study is based upon Jean Piaget's Theory of Cognitive Development (1936). According to Piaget (1936), children progress through four stages of intellectual development, reflecting increasing sophistication of thought. The Theory provides a foundational framework for how children acquire knowledge and process information as they grow. It is important to understand an overview of these stages, the benchmarks of each stage, and how a typically developing child moves from one stage to the next. Once there is an understanding of how a typically developing child moves through the stages, a contrast can be made with differences for a child who has been diagnosed with dyslexia. In that aim, a brief overview of each stage is as follows:

Sensorimotor Stage (Birth to 2 years): In this stage, infants explore the world through their senses and actions. Their cognitive development is centered around understanding their immediate environment and developing basic sensorimotor skills. The main cognitive achievement of this stage is object permanence. When a child achieves object permanence, he or she knows that an object still exists, even if it is hidden. This requires the ability to form a mental representation of the object, which is a significant cognitive milestone. Language also starts to appear, as children are realizing that words can be used to represent objects and feelings.

Preoperational Stage (2 - 7 years): At the beginning of this stage, the child is egocentric, meaning he assumes that other people see the world as he does. However, as a child moves through this stage, egocentrism declines and the child begins to enjoy the participation of another child in their play.

Children in this stage develop symbolic thinking and language skills. Symbolic thinking is the ability to make one thing, such as a word or an object, stand for something other than itself. This is a critical component for reading development.

Concrete Operational Stage (7-11 years): The stage is called concrete because children can think logically much more successfully if they can manipulate real (concrete) materials. Piaget considered this stage a major turning point in a child's cognitive development, as it marks the beginning of logical or operational thought. Operational thought involves following a set of logical rules. Children in this stage struggle with abstract thinking, so they tend to make mistakes or be overwhelmed when asked to reason about abstract or hypothetical problems. Because the concrete operational stage involves the development of logical thought processes, including the ability to understand and manipulate language to solve problems, difficulties in language processing due to dyslexia could interfere with the development of these skills.

Formal Operational Stage (12 years and older): Adolescents in this stage develop abstract thinking abilities, hypothetical reasoning, and the capacity for logical thought. They can deal with hypothetical problems with many possible solutions, as well as speculate about possible consequences.

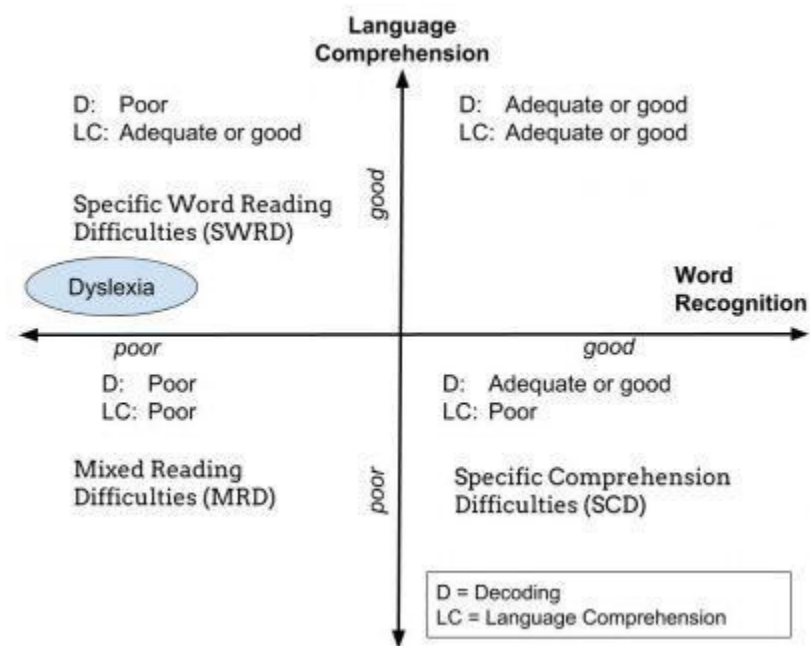
As outlined above, key milestones occur in each stage of cognitive development. The achievement of these milestones, or lack thereof, could be potential indicators of dyslexia. For example, in the Sensorimotor Stage, delays in language development or difficulty in phonological awareness could be early indicators of dyslexia in children as young as age two. Early language acquisition milestones are critical to future reading skills. Additionally, in the Preoperational Stage, children typically develop symbolic thinking and language skills. A critical piece for future reading skills is the ability to make one thing, such as a word or an object, stand for something other than itself. This is a vital element in the science of reading: letters represent sounds or phonemes, and a combination of phonemes creates a word. A child's phonemic awareness, or the ability to identify and manipulate individual sounds (phonemes) in spoken words, is a critical building block for a child to learn to read. Lack of phonemic awareness in this developmental stage could be an early indicator of dyslexia.

In applying Piaget's Theory of Cognitive Development to the concept of early screening for dyslexia, this theoretical framework suggests that early screening in the age range of 2 - 7 could be a valid age range to find early indicators of dyslexia. In particular, key language milestones occur during this developmental stage, including development of phonemic awareness as well as symbolic thinking.

With Piaget's Theory of Cognitive Development as the foundation, educational researchers have debated the science of reading for many years. In 1986, researchers Gogh and Tunmer proposed another framework known

as The Simple View of Reading (SVR). The SVR shows us that reading is a complex activity composed of two interdependent processes: word recognition (decoding) and language comprehension. Word recognition is the ability to read and understand the words on a page, and language comprehension is the ability to make sense of the language we hear and the language we read (Wooldridge, 2022). As represented in the diagram below, students with dyslexia are considered to have poor word recognition (decoding), but they may have good language comprehension.

Figure 1
The Simple View of Reading



From Wooldridge, Lorna (2022). *The Simple View of Reading (SVR)- Part 3*. Orton Gillingham Online Academy.

The Simple View of Reading framework is important to mention as an additional framework interconnected with the foundation already established by Piaget. The SVR emphasizes the interaction between decoding and overall language comprehension in determining reading comprehension skills. Similarly, Piaget's Theory of Cognitive Development outlines the prerequisite cognitive processes that are required building blocks for the development of

higher-order thinking skills. The two frameworks intersect in highlighting the importance of foundational cognitive processes required in determining an individual's reading abilities.

Definition of Key Terms

Over the past 30 years, extensive research has been conducted in a concerted effort to understand dyslexia. In September 2016, the United States Senate passed Senate Resolution 576 which called upon Congress, schools, and state and local agencies to "recognize the significant educational implications of dyslexia that must be addressed" (California Dyslexia Guidelines, 2018, p.15). To address these educational implications, a baseline understanding of key terms must be in place.

Decoding: A skill that refers to translating letters into their corresponding speech sounds and synthesizing these sounds to form words (California Dyslexia Guidelines, 2018).

Dyslexia: Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge (International Dyslexia Association, 2024).

Language Comprehension: Language comprehension is the ability to understand the different elements of spoken or written language, like the meaning of words and how words are put together to form sentences. Language comprehension is one of the building blocks of reading comprehension (Gibbs, 2021).

Multi-Tiered System of Supports (MTSS): A multi-tiered system of supports (MTSS) is a proactive and preventative framework that integrates data and instruction to maximize student achievement and support students' social, emotional, and behavior needs from a strengths-based perspective. MTSS offers a framework for educators to engage in data-based decision making related to program improvement, high-quality instruction and intervention, social and emotional learning, and positive behavioral supports necessary to ensure positive outcomes for districts, schools, teachers, and students. The MTSS framework is comprised of four essential components: screening, progress monitoring, multi-level prevention system, and data-based decision making. Depending on state law, MTSS data may also support identification of students with learning or other disabilities (Center on Multi-Tiered System of Supports, 2024).

Phoneme: The smallest unit of speech sound that can convey a unique meaning, consisting of consonants, long and short vowels, digraphs and other

sounds. Each language has its own unique set of phonemes. In English there are 44 sounds. Spanish has just 24, French 34, German 46, and Italian 49. Phonemes are the critical building blocks of language that dyslexics have a lot of difficulty manipulating when it comes time to read or write and even speak. For example, the words Bat, Mat, Cat and Rat all differ by just one sound, but that one sound makes all the difference in meaning (The Reading Well, 2023).

Phonemic Awareness: The ability to distinguish and manipulate phonemes, the smallest units of speech sound that can carry a meaning. In English there are 44 of these sounds. The awareness can be demonstrated in the ability to isolate, blend and otherwise manipulate the essential sounds of language—for example by recognizing a set of words all beginning with the /h/ sound or isolating a sound at the beginning, middle or end of a word. It does not require spelling or even the use of letters (The Reading Well, 2023).

Phonological Awareness: An individual's awareness of and access to the sound structure of oral language. It is the understanding that spoken language can be divided into smaller units (i.e., words, syllables, onset-rime, and phonemes) and that those units can be identified and manipulated. Rhyming is also a task of phonological awareness (California Dyslexia Guidelines, 2018).

Phonological Processing: Refers to a cognitive skill critical to our language development. It is the brain's ability to manage and manipulate phonemes, and to attach meaning to sounds in both spoken and written language. Processing sounds allows a baby to learn that babbling /ma-ma/ attaches to mama/momma, becoming the word mommy; likewise, babbling /da-da/ attaches to dada, becoming the word daddy. Processing is both perceiving and attaching meaning. It is needed for listening, speaking, reading, and writing—the four modes of language that make up the majority of our communication (Rooted in Language, 2016).

Structured Literacy: An instructional approach that describes the type of explicit and systematic reading instruction supported by research (Baker, 2023).

Universal Screening: Brief assessment of a particular skill or ability that is highly predictive of a later outcome. Screening measures are designed to quickly differentiate students into one of two groups: 1) those who require intervention and 2) those who do not. A screening measure needs to focus on specific skills that are highly correlated with broader measures of reading achievement resulting in a highly accurate sorting of students. Universal screening tools have the following characteristics:

- Quick and targeted assessments of discrete skills that indicate whether students are making adequate progress in reading achievement
- Alternate equivalent forms so they can be administered three to four times a year

- Standardized directions for administration and scoring
- Have established reliability and validity standards

(International Dyslexia Association, 2024)

Word Recognition: The ability to read words accurately and automatically (Murray, 2016).

Summary

Extensive research has been conducted, and experts in education concur that dyslexia can affect 1 in 5 students. Additionally, research shows that a child's ability to read at grade level by third grade is the single greatest predictor of future success in school. It is urgent that students with dyslexia are identified as early as possible and that their specific needs are addressed. Emphasis has been placed on early and universal screening for dyslexia and other reading disabilities. For school districts that have put this practice into place, do their third grade reading scores reveal an increase in student achievement? This research project will seek to investigate the impact of early screening on third grade reading achievement.

Chapter 2 of this project explores existing literature to further delineate the complexities of establishing a universal definition for dyslexia. In addition, the literature review evaluates federal and state legislation that exists regarding universal screening for dyslexia, and investigates the recommended screening tools by state boards of education. Efficacy of screening tools will also be discussed in this chapter. Finally, an inquiry into literature from school districts that have implemented universal screening is conducted to examine the impact on third grade reading scores.

Chapter 2: Review of Related Literature: The Impact of Early Dyslexia Screening (PK-3) on Reading Achievement of Third Grade Students

Introduction

In 2004, dyslexia was included as a Specific Learning Disability (SLD) under the Individuals with Disabilities Education Act. Research suggests that 20% of school-aged children today are affected by this learning disability (Wagner et al., 2020). However, students with dyslexia often go undiagnosed throughout their early (PK-3) educational years, thus they are at risk for underachievement, dropout, and mental health problems. To combat the issue of undiagnosed dyslexia, early and universal screening for dyslexia is now mandated in 41 states (Heubeck, 2023). This literature review investigates the impact of early dyslexia screening (PK-3) on the reading achievement of third grade students in states where early and universal screening has been mandated.

Over the past 20 years, significant research has been conducted to

increase awareness and understanding of dyslexia and how this learning disability impacts students' ability to read and learn. This review of literature summarizes historical perspectives on establishing a universal definition of dyslexia and further explains how the universal definition drives the early screening process. Next, an overview of federal and state legislation regarding dyslexia is compared and contrasted, highlighting the positive and negative implications of legislation and mandates on key stakeholders. Approved screening tools are investigated and reviewed in an effort to determine the most highly recommended and accurate tool(s) for early and universal screening. Furthermore, qualitative and quantitative data on reading scores for states with universal screening in place are reviewed and analyzed.

Universal Definition for Dyslexia

Historically, the best-known definition of dyslexia comes from the World Federation of Neurology in 1968, which defines it as a disorder that makes it difficult to learn to read despite adequate intelligence, conventional instruction, and sociocultural opportunities (Critchley, 1970). The definition also specifies that dyslexia is caused by fundamental cognitive disabilities that are often constitutional in origin. This definition is similar to the definition of dyslexia established by the International Classification of Diseases -10 (2013), in that both of these definitions relied on discrepancies between a child's Intelligence Quotient (IQ) and achievement as an indicator for the unexpected nature of dyslexia. In contrast, in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) definitions of dyslexia based on IQ-achievement discrepancy criteria were rejected, citing a lack of evidence for the validity of this classification (Miciak & Fletcher, 2020). The DSM-5 identified difficulties in word reading accuracy, fluency, and reading comprehension as specifiers for a reading disability. Difficulties with the accuracy and fluency of single word reading skills were linked to dyslexia, but it was not a specific category in the DSM-5. There is no consensus regarding the IQ component in the definition of dyslexia between the World Federation of Neurology and the DSM-5. However, both organizations consistently define dyslexia as a difficulty in reading.

In pursuit of the most current, universal definition of dyslexia, the United States Senate created a newer definition in the development of the First Step Act (Cassidy, 2019). In the First Step Act, dyslexia is defined as,

An unexpected difficulty in reading for an individual who has the intelligence to be a much better reader, most commonly caused by a difficulty in the phonological processing (the appreciation of the individual sounds of spoken language), which affects the ability of an individual to speak, read, and spell. (Cassidy, 2019, para. 8)

Despite the United States Senate definition of dyslexia in the First Step Act

at a federal level, many state-level definitions of dyslexia have employed the well-known International Dyslexia Association definition. The International Dyslexia Association defines dyslexia as,

Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge. (Lyon et al., 2003, p. 2)

In reviewing these four definitions of dyslexia, a conclusion can be drawn that much of the debate around the identification of dyslexia and other specific learning disabilities hinges on central questions about the role of IQ and cognitive discrepancies. Dyslexia is nuanced and requires a broad assessment of cognitive skills and a specific evaluation of more detailed components of reading skills, such as phonemic awareness and phonological processing. Piaget's Theory of Cognitive Development (1936) states that these critical components for reading are typically developed between the ages of 2 and 7 years old, defined as the Preoperational Stage, affirming the notion of early screening being possible in this age range of children. The phonological component of language, or an individual's awareness of sound structure identified by Piaget (1936) in the Preoperational Stage, is specifically mentioned in both the federal definition as well as the International Dyslexia Association (IDA) definition. IDA further expands on the phonological component by mentioning secondary consequences such as weak reading comprehension and impediment in vocabulary growth. All of these factors are important to note in defining dyslexia as well as determining the appropriate age range and methods for screening tools to accurately identify students at risk for dyslexia.

Legislation Regarding Universal Screening

In 1985, Texas was the first state to implement mandatory dyslexia testing (Hanford, 2017b). The 1985 law was later repealed and modified, with 1995 Texas legislation mandating screenings, or brief evaluations that help determine a student's risk of reading problems and dyslexia. These screenings are not intended to replace more thorough assessments. However, the data collected from the screenings can help identify students who may need additional support. Other states began adopting similar laws for universal dyslexia screening, and in 2023 California joined the 40 other states that all now mandate dyslexia screening (Heubeck, 2023).

State dyslexia laws are significant because they are more in-depth on directives to support students with dyslexia than federal laws such as the

Individuals with Disabilities Education Act (IDEA, 1975). IDEA classifies dyslexia as a specific learning disability or SLD. However, the legislation neither provides a definition for dyslexia nor prescribes how states should address it in educational settings. By providing more detail than IDEA, state dyslexia laws aim to manage support criteria for students with dyslexia. Dyslexia laws focus on different things in different states. In general, they address one or more of the following issues:

- Defining dyslexia and other conditions that affect language learning
- Early screening and identification of students with dyslexia in grades K-3
- Procedures for states/schools for screening and intervention (known as dyslexia handbooks)
- Training and professional development for current teachers
- Education about dyslexia in teacher preparation programs
- Accommodations, support, and early intervention for kids identified as having dyslexia or being at risk
- Funding for programs (Morin, 2024).

California published a statewide dyslexia handbook in 2017. This 136-page handbook, entitled *California Dyslexia Guidelines (2017)*, was written in response to the passage of Assembly Bill 1369, Chapter 647, Statutes of 2015, which added sections 56334 and 56335 to California's Education Code. The purpose of these guidelines is to assist regular education teachers, special education teachers, and parents in identifying, assessing, and supporting students with dyslexia (California Dyslexia Guidelines, 2017). California's handbook goes into considerable detail on the characteristics of dyslexia by age group, effective approaches for teaching students with dyslexia, and screening and assessment for dyslexia.

Regarding screening and assessment for dyslexia, California Dyslexia Guidelines (2017) specify that screening is a critical first step in the identification of effective intervention for students with dyslexia. The guidelines detail critical skills for screening and comprehensive assessment, including phonological awareness, rapid naming skills, alphabet knowledge, grapheme-phoneme association, decoding, and reading comprehension. To be identified as having dyslexia in the state of California, the following areas should be assessed:

1. Difficulties with accurate and fluent word recognition, and poor spelling and decoding abilities
2. Deficits in the phonological component of language
3. Difficulties that are unexpected in relation to other cognitive abilities
4. Difficulties that are unexpected in relation to the provision of effective classroom instruction (California Dyslexia Guidelines, 2017)

California Dyslexia Guidelines were published in 2017. Despite the documented criticality of early and universal screening to identify students with dyslexia, California did not mandate universal screening when these guidelines were published, but it was not due to lack of effort. California state Senator Portantino tried and failed twice between 2020-2023 to pass legislation that would have mandated universal screening for students in kindergarten through second grade. The California Teachers Association (CTA) strongly opposed Portantino's bills during this time. CTA representative Briggs, a spokesperson for the union, said the association's leadership team believed that bills would have caused "unintended harmful consequences" (Hong, 2023, para. 11). "The association's position is that universal screening will take valuable time away from instruction and may misidentify English learners as dyslexic by mistaking their lack of fluency in English for a learning disability" (Hong, 2023, para.11). In response to the union's objections, a chorus of experts and classroom teachers, backed by a well-established body of research, contradict its arguments (Hong, 2023). In addition, California Governor Newsom, who is dyslexic, supported dyslexia research by funding the University of California at San Francisco (UCSF) Dyslexia Center with an extensive amount of \$28 million in recent years (Hong, 2023). These persistent efforts did not return void, as the fourth attempt at passing legislation for early dyslexia screening was proposed in February of 2023. Governor Newsom signed into law a bill that will require schools to implement universal screening in kindergarten through 2nd grade for reading delays, including the risk of dyslexia in July of 2023 (Heubeck, 2023). Governor Newsom's revised budget announcement in May of 2023 allotted \$1 million to fund the dyslexia screening program—including a panel that would select a screening tool, relevant teacher training, and requisite screening of all children in kindergarten through 2nd grade for risks of dyslexia and associated reading delays, beginning in 2025-26. (Heubeck, 2023).

Similar to California Dyslexia Guidelines (2017) referenced in this section, many other states publish handbooks and guidelines of their own. In addition to these state-level manuals, there are district and school-based specifications on how to implement the guidelines. Schools and even individual teachers may vary in how they identify and support students with dyslexia. IDEA is the national law that identifies dyslexia as a specific learning disability. States have the authority to implement education plans to support students with dyslexia in different ways. Even though there is variation on implementation, state laws must give students the rights and protections mandated in federal law.

Screening Tools

With over 40 states mandating early and universal screening for dyslexia, additional challenges emerge as state legislation typically does not differentiate between screening and diagnosis. Experts delineate screening from

diagnosis as follows,

Screening should be defined as rapid triage of entire classrooms to identify risk, which corresponds to universal screening in a multi-tiered system of support (MTSS). Diagnosis requires more extensive assessment that can be costly and time-consuming, completed by assessment professionals, not teachers. (Fletcher et al., 2020, p. 146)

An effective screening program is critical, as it can decrease the significant financial burden of comprehensive diagnostic assessment for all students. With effective screening in place, more extensive assessments, requiring significant financial and time expenditures by assessment professionals, can be focused on those students with the highest need.

Technology for early and universal screening emerged over 40 years ago. During that period, assessments were developed to predict which kindergarten children would experience difficulty learning to read (Fletcher et al., 2020). One such assessment was developed by a study called the Florida Longitudinal Project (Satz et al., 1978). This project followed several hundred children starting in kindergarten and continuing up through grade six. The goal was to evaluate kindergarten precursors that would predict future reading ability (Satz & Fletcher, 1982). The resulting screening tool from this project was a 20-minute kindergarten assessment that included four measures: perceptual-motor skills, perceptual-discrimination skills, vocabulary, and alphabet knowledge (Fletcher et al, 2020). According to this study, alphabet knowledge emerged as the best single predictor for future reading ability (Fletcher et al., 2020). Piaget's Theory of Cognitive Development (1936) states that a typical kindergarten student, 5 or 6 years of age, would most likely be in the Pre-operational Stage of development, ages 2 to 7 years. A key milestone in the Preoperational Stage is a child's development of symbolic thinking, the ability to make one thing, such as a word or an object, stand for something other than itself. The findings of the Florida Longitudinal Project, which identify vocabulary and alphabet knowledge as the best predictors of reading ability at this age, align with the theoretical framework established by Piaget. If children are behind on these cognitive milestones as established by Piaget's theory, this could be an indicator of dyslexia or another reading disability.

Based on studies like this one from the Florida Longitudinal Project, along with many others, there is now a considerable amount of evidence that assessing precursors of reading at a pre-kindergarten or kindergarten level can predict future achievement. However, the predictors now employed in 2024 have evolved from those used by Satz beginning in 1978. The precursors of reading that are currently considered best-practice benchmarks in determining future reading achievement include measures of phonemic awareness, rapid naming of letters and numbers, alphabetic knowledge (e.g., knowledge of letter sounds), and vocabulary (Fletcher et al., 2021). Educators nationwide continue to seek out the most accurate and reliable screening tools that quickly

and efficiently measure these skills in early school years. Based on this literature review, there was no obvious nationwide leader or widely accepted screening tool. Rather, many different screening tools are utilized, and each one appears to have its own positive and negative aspects.

Decision errors will occur with all screening tools. Some children will be missed in the screening process, that is, they could be identified as not "at risk" when, in fact, they do have reading problems in the future. Alternatively, children could be identified with a false-positive error, meaning they are identified as "at risk" but do not, in fact, develop a reading difficulty in the future (Fletcher et al., 2021). Despite decision errors, screening tools are still considered a valuable tool in reducing the burden on teachers and helping to identify students with precursors of reading difficulty.

To narrow down the scope of screening tools, this literature review focuses on the screening tools identified in the state of Ohio after the state passed House Bill 436, mandating universal screening for early identification of dyslexia. Educators in Ohio see the need for early identification and have grown tired of the wait-and-see method (Baker, 2023). The conflict, unfortunately, is the funding needed for all the curriculum, assessments and resources required for effective instruction (Baker, 2023). The table below identifies the universal screeners approved by the state of Ohio. School districts in Ohio are required to use these screeners to meet the mandate, absorbing the cost as outlined below (Baker, 2023).

Table 1
Samples of Universal Screeners

Vendor	Assesment	Price Per Student	Professional Development
Acadience Learning, Inc	Acadience Reading K-6	Data Management: \$1.50 Learning Online: Up to \$9.95	Yes, at cost. Costs vary
Pearson Clinical Assessment	aimswebPlus	\$8.50	Yes, in addition, train the trainer offered to train local staff
Curriculum Associates, LLC	i-Ready	\$6 Assesment Only	Fee-based onsite professional development
Lexia Learning, LLC	Lexia RAPID Assessment	Varies per amount of licenses \$5.40-\$7.20	Provides professional learning sessions and tools.
NWEA	MAP Growth	District contact for prices	Implementation support, professional learning opprotunities, and account management services
Amplify Education, Inc	mCLASS DIBELS 8th Edition	\$9.00	Various onsite/remote professional developments offered
Renaissance Learning, Inc	Star Reading	\$3.80	Professional development, tools, and resources offered per request.

Note: Table uses information listed on vendor websites. From "Universal Screening and House Bill 436," by Kristen Baker, 2023, Ohio Journal of English Language Arts, 62(2), p. 41.

Once screeners are selected, there are many other decisions that need to be made, including school-wide benchmarks. These benchmarks often vary from school to school and even from grade level to grade level. This is why coming to a schoolwide agreement on what assessments are going to be used and how the results are going to be monitored and practiced is essential. Many educators hope the state will offer more support for educators identifying their school-wide benchmarks, which in turn will assist in finding students who need the intervention while leading to less overidentification of students with disabilities (Baker, 2023). Although there is much more work to be done, Ohio validates the importance of universal screeners at an early age to begin identifying students at risk with dyslexia through House Bill 436. While the screening mandated in the law was delayed by a year, public schools were required to administer an approved tier-one dyslexia screening measure to each student in grades kindergarten to third grade for the 2023-2024 school year.

With the approved screeners in Ohio as a benchmark, other states with universal screening for dyslexia in place were considered to compare approved screening tools. As of 2022, the Texas Education Agency (TEA) designated five approved universal screening tools for dyslexia. Two of the screeners approved in Ohio were also on the list approved by the Texas Education Agency, DIBELS and aimswebPlus. Other than DIBELS and aimswebPlus, the approved screeners in Texas appear to be state developed: Texas Middle School Fluency Assessment (TMSFA), Texas Primary Reading Inventory (TPRI), and Texas Middle School Reading Inventory (TMSRI).

The state board of education in Tennessee approved seven universal reading screeners in July of 2021. Consistent with the state of Ohio, Tennessee also approved aimswebPlus (known in Tennessee as the Tennessee Universal Reading Screener), DIBELS 8th Edition, iReady, MAP Growth, and Star Reading. Two screeners that Tennessee approved are not on the Ohio list, specifically screeners labeled easyCBM and FastBridge/FAST Suite.

In reviewing screening tools approved in Ohio, Texas, and Tennessee, the tools approved by all three states include DIBELS and aimswebPlus. The DIBELS measure consists of brief teacher-administered measures of literacy fundamentals such as letter naming, initial sound identification, phoneme segmentation, nonsense word reading, and oral reading, and are administered at different points across Grades K through 8 (Burns et al., 2023). On the positive side, research has consistently shown that data from DIBELS screening can predict other reading outcomes such as state test results even among students from different racial/ethnic groups, from varying levels of socioeconomic backgrounds, and with variable language proficiency (Burns et al., 2023). However, there may be a tendency to over-identify students with reading difficulties using DIBELS data. DIBELS continues to refine and update its screening tools for accuracy, with the 8th edition being the most current version.

Similar to DIBELS, aimswebPlus as a universal screening tool for dys-

lexia has some positive aspects as well as some downsides. On a positive note, the International Dyslexia Association (IDA) approves aimswebPlus as a universal screening assessment to be used with all children beginning in kindergarten. The aimswebPlus assessment considers factors such as reading comprehension, oral reading fluency, silent reading fluency, and vocabulary. A benefit of this assessment is that it considers factors included in the Simple View of Reading framework as key indicators of dyslexia, particularly reading comprehension. One downside for the assessment is that it is not specific to dyslexia. In addition, according to the aimswebPlus assessment guide, the assessment is intended for grades two through eight.

This literature review of screening tools reveals that universal screening is a complex matter indeed. Selection of the most effective screening tool includes many factors, including elements of reading skill measured, cost of assessment, professional development, accuracy of assessment, time, and staffing. Universal screening is a significant undertaking, and it takes several years to determine whether the screening can positively impact future reading scores and academic achievement. However, legislation in more than 40 states now requires universal screening and educators are mandated to act accordingly.

Reading Scores in States Where Universal Screening is in Place

From a high-level perspective, the implementation of universal screening for dyslexia and comprehensive literacy strategies has led to notable improvements in third grade reading scores in the state of Tennessee. Specifically, the 2023 Tennessee Comprehensive Assessment Program (TCAP) showed a 4.3% increase in the number of third grade students meeting or exceeding English Language Arts expectations as compared to this same statistic in 2022. This number is significant, as it marks the highest proficiency rate since new English Language Arts standards were introduced in Tennessee in 2017 (TN Department of Education, 2023).

In Ohio, it may be too soon to determine the efficacy of universal screening. Ohio signed into law House Bill 436 in January 2021, mandating early and universal screening for dyslexia. However, screening mandated in the law was delayed and public schools were required to administer an approved tier one dyslexia screening measure to each student in kindergarten through third grade beginning in the 2023-2024 school year. Efficacy of universal screening in Ohio as a means of predicting future reading achievement will take several more years to fully assess. However, universal screening is already viewed as a, “cost-efficient, quick, and valid way to begin the Response to Intervention (RTI) process and identify at-risk students for dyslexia,” (Baker, 2023, p.44). Furthermore, Ohio now sees the importance of universal screeners at an early age to begin identifying students at risk with dyslexia (Baker, 2023).

Similar to Tennessee, the focus on early dyslexia screening and inter

vention in Texas has contributed to improved reading skills among elementary students (Texas Education Agency, 2024). This is a promising step towards better overall educational outcomes. While it is challenging to directly attribute changes in reading scores solely to dyslexia screening, these measures are part of a comprehensive strategy to enhance reading proficiency. Texas passed a law in 1997 mandating early screening for reading problems, including dyslexia, for all kindergarten, first grade, and second grade students (Fletcher et al., 2021). From 1997 to 2000, reading scores of third grade students in Texas reflect a general upward trend in reading proficiency (Klein et al., 2000). According to The Nation's Report Card, which tracks fourth grade reading proficiency but not third grade scores, "the percentage of students in Texas who performed at or above the NAEP Proficient level was 30 percent in 2022. This percentage was not significantly different from 30 percent in 2019 and 28 percent in 1998" (The Nation's Report Card, 2022). The NAEP proficiency levels do not indicate a significant improvement in reading scores since implementing universal screening for dyslexia and other reading disabilities in 1997.

In practice, the goal for schools is that universal screening tools administered in kindergarten, first, or second grade will correctly identify students who may be at risk for not passing state-mandated reading tests at the end of third grade (Rice et al., 2024). Accurate identification of students who may be at risk will be the first step in creating a RTI plan for that student, as well as providing the direct and explicit instruction needed. However, the challenge at hand is determining whether these early identification measures are accurate, as many variables exist that can impact the third grade reading scores of students who are identified as at-risk in early screening. With the state of Texas being at the forefront of universal screening, putting measures into place as early as 1985, a study conducted by the American Psychological Association in Texas was selected for this research review. The study examined the accuracy of using an early reading screening tool at the end of kindergarten to predict which students are at risk for poor outcomes on a state-mandated reading test in third grade. The cohort of students for this study attended kindergarten in 2014 – 2015 and were enrolled in third grade in 2017 – 2018. This was the only cohort of students that both Kindergarten screening scores, utilizing ISIP-ER for screening, as well as third grade state testing scores, utilizing STAAR state testing, were available (Rice et al., 2024). The total number of students included was 962 for this study. The "analyses suggested a moderate relationship between ISIP-ER in kindergarten and third grade STAAR reading scores," (Rice et al., 2024, p. 77). It is important to note that the data in this study showed that students were overidentified as having a reading disability, meaning their scores in third grade indicated they were not actually at risk. However, a limitation noted for the study was that researchers were unable to consider instructional variables. "Intervention services provided to students identified in kindergarten likely had an impact on their later reading outcomes, which would have an impact on the classification accuracy of the screening

tool" (Rice et al., 2024, p. 79). In summary, the study found that this particular screening tool, ISIP-ER, has some limitations in accurately identifying students at risk for poor outcomes in later standardized testing (Rice et al., 2024). Screening tools would likely need to be combined with other methods of assessment and progress monitoring to ensure the best outcome.

Despite having universal screening for dyslexia in place since 1985, the state of Texas has struggled with ensuring students are reading at grade level by third grade. In the most recent projections for Fort Worth Independent School District (ISD), the fifth largest district in Texas encompassing more than 85,000 students, administrators informed the school board that only 19% of third grade students would meet grade level standards for the state exam (Sanchez, 2023). This projection is a significant decrease from the previous year, with 37% of third grade students meeting grade level standards in 2022 (Sanchez, 2023). The Chief Academic Officer for Fort Worth ISD described the numbers as not acceptable. Part of the drop in numbers was attributed to the rollout of a new reading curriculum, indicating a learning curve for teachers and the need for additional support (Sanchez, 2023). The district stands by its decision to adopt a new curriculum, indicating the investment is for long term results (Sanchez, 2023).

Criticism of Universal Screening for Dyslexia

As identified in the 2024 study conducted in Texas by the American Psychological Association, isolating the clear and true impact of universal screening alone on third grade reading scores is a difficult task. Because of the plethora of variables that can impact a student's ability to read, quantifying the value of universal screening appears to be an elusive endeavor. In addition to the difficulty of conducting a true cost/benefit analysis for universal screening, there are other critics, such as the California Teachers Union, that continue to oppose universal screening for dyslexia. The Teachers Union claims children learn to read at their own pace, and therefore identifying a potential risk for dyslexia or other reading disorder at a kindergarten age could derail some students both academically and emotionally (Hong, 2023). This issue is particularly a challenge with students who are English learners, the Teachers Union purports. Students learning English as a second language should not be held to the same screening measures as other students, the opponents to universal screening claim. This is a valid argument and one that needs to be addressed on an individual school and student level. The role of a classroom teacher, or other provider, who truly knows a student's abilities is critical in the qualitative aspect of screening children for dyslexia.

The cost of implementation for early and universal screening for dyslexia is also a large area of concern and criticism. As documented by the state of Ohio, several of the approved screening tools can cost as much as \$8.00 per student, per screening. When students are expected to be screened universally, then monitored continually, this cost grows exponentially. In addition to the

screening cost per student, there is significant investment ahead of time to select the screening tools by state as well as expenditures for training and professional development of staff. California budgeted \$1 million to fund their screening program, which included a panel to select a screening tool, relevant teacher training, and requisite screening of all children in kindergarten through second grade for risks of dyslexia and associated reading delays (Heubeck, 2023). The question remains from the critics of universal screening, does the benefit of screening outweigh the significant cost to implement? The ability to quantify the exact impact and effectiveness of screening remains unclear.

Summary

Universal screening for dyslexia is a complex challenge in our education system. Though widely accepted as an important first step in providing students with direct and explicit instruction necessary for them to thrive in reading, there is a gap in quantitative data showing specifics of the impact on third grade reading scores. The American Psychological Association study conducted in Texas indicates that early screeners had a moderate relationship with third grade reading scores. The study also showed that there were instructional variables that were not able to be considered. This widely accepted practice, as evidenced by legislation mandating early screening in more than 40 states, is one step in the nuanced path of improving reading scores nationwide. Additional research into practices implemented in states where reading scores have improved over time would be of great benefit to educators nationwide. Chapter 3 of this research review examines additional implications for classroom practice and school policy, as well as recommendations for future study.

Chapter 3: Implications

Introduction

Significant research has been conducted over the past 20 years to increase awareness and understanding of dyslexia and how this learning disability impacts students' ability to read and learn. Experts in the field of education and brain science have collaborated over this time period to establish a universal definition for dyslexia as well as provide further details on how this definition drives the early screening process, measuring key developmental reading elements such as phonemic awareness and phonological processing. 41 states now have legislation mandating early screening for dyslexia, and some states have developed a recommended list of approved screening tools to be utilized by those parties involved in the screening process. The goal of these extensive measures is to help students reach their full potential in reading skills. The stakes are high in this pursuit, as the ability to read at grade level by third grade is the single-greatest predictor of a student's future success in school.

Conclusions

Experts in the field of neurology and diagnostic medicine have differed on elements included in the universal definition of dyslexia. The United States Senate also contributed to the development of a newer definition of dyslexia in an effort to further define this specific learning disability. A conclusion can be drawn that much of the debate around the identification of dyslexia and other learning disabilities centers around the role of a student's Intelligence Quotient (IQ) and cognitive discrepancies when compared to their neurotypical peers (Lyon et al., 2003). States such as California have detailed out their own definitions of dyslexia in a published guide for educators and others who are interested in learning more about this learning disability (California Dyslexia Guidelines, 2017). Establishing this universal definition for dyslexia is essential in determining measures for screening.

Based on the review of legislation conducted in Chapter 2 of this project, there are policy implications at both the federal level and at state level for students with dyslexia. Federal law includes dyslexia as a specific learning disability under the Individuals with Disabilities Education Act (IDEA, 1975). Although this provision is mandated under federal law, state dyslexia laws are significant because they give more in-depth directives on how to support students. Federal law does not mandate universal screening for dyslexia. Rather, universal screening has been a directive by 41 states in their policies and procedures to support students. In addition to legislation for universal screening, many states, including California, publish detailed and extensive instructions on building the best educational plans for students with dyslexia. California's guidelines provide details on directives such as assessment tools, assistive technology, effective approaches for teaching students with dyslexia, socioemotional factors of dyslexia, and more (California Dyslexia Guidelines, 2017). In summary, Federal law includes dyslexia as a specific learning disability requiring the provisions of IDEA. State laws determine how to further support students with dyslexia, including universal screening, intervention, and ongoing progress monitoring. State laws drive policies and procedures created by Local Education Agencies, school boards, and school sites. The critical first step is early identification of students who need additional support under these provisions of law. Early and universal screening for dyslexia during the Pre-K - 3 school years assists in this process of identification.

This review of research has revealed that many different screening tools have been developed, and the recommended screening tools vary from state to state. There is some overlap in recommendations on screening tools by state, specifically in the review of screening tools for the states of Ohio, Texas, and Tennessee. In these three states, the DIBELS screening tool as well as the aimswebPlus screening tool are both on the list of approved

screening measures. Both screening tools have a cost-per-student expense as well as a commitment to professional development requirements for implementation. The choice of a best practice screening tool is one decision that must be made by the school districts, with many decisions on school-wide benchmarks and monitoring to follow. Despite the variation in approved screening tools by state, the precursors of reading that are currently considered essential benchmarks in determining future reading achievement include measures of phonemic awareness, rapid naming of letters and numbers, alphabetic knowledge, and vocabulary (Fletcher et al., 2021).

From a high-level perspective, the implementation of universal screening for dyslexia in the states of Texas and Tennessee has contributed to improved reading skills among elementary students. Universal screening is recognized as a promising step towards better overall educational outcomes and specifically reading scores. This review of existing research has revealed that it is challenging to directly attribute an improvement in reading scores to dyslexia screening alone, as these measures are typically part of a comprehensive strategy to enhance reading proficiency. Studies such as the one conducted by the American Psychological Association in 2024 indicate that there is a moderate relationship between screening scores in kindergarten and the corresponding third grade standardized testing reading score for that given student. In states such as Ohio and California, where universal screening is newly mandated, it is too soon to quantify the impact of universal screening alone on third grade reading scores. The conclusion can be drawn that universal screening is an important and necessary first step as part of a more comprehensive focus to improve reading scores.

Practice Implications

The widespread implementation of early screening for dyslexia in public schools has significant implications for the classroom and school staff. Teachers require further training to understand dyslexia and to administer screenings effectively. Further, when a student is identified as showing signs for dyslexia on early screening administration, additional action and planning will take place. Educators will need to work with school staff and family members to implement direct and explicit instructional support through the existing Multi-Tiered System of Supports (MTSS) in schools (Baker, 2023). Additionally, there is ongoing progress monitoring as well as benchmarks that need to be established for each student. There may also need to be adjustments made to curriculum to fully support the students identified as at-risk for dyslexia. Adjustments could include the incorporation of multi-sensory learning techniques, scaffolding, and in some instances, students may require Individual Education Plans (IEPs) to ensure they receive the accommodations and modifications needed to fully support their learning (Hanford, 2017b). For children that had previously remained unidentified, none of these steps would have taken place. Rather, the student may have made it through to

third grade without establishing solid reading skills.

In consideration of implications at the state level, California educators will be mandated to screen universally for dyslexia in the 2025-2026 school year (Heubeck, 2023). “California Governor Newsom’s revised budget announcement in May of 2023 allotted \$1 million to fund the screening program - including a panel that would select a screening tool, relevant teacher training, and requisite screening of all children in kindergarten through second grade for risks of dyslexia and associated reading delays” (Heubeck, 2023, p.2). Although the funding did provide some relief to the concerns of the teacher’s union about implementation, there remains a significant investment of time and resources required to ensure schools comply with the mandates. School staff will also need to establish benchmarks on timing for the initial screening of all students in a new school year, as well as ongoing monitoring and support for students identified as at-risk for dyslexia.

Policy Implications

With universal screening for dyslexia being legislated at the state level, there are significant policy implications. For example, California proposed legislation for early screening on multiple occasions before finally signing the bill into law in 2023 (Hong, 2023). Policy makers were required to expend significant funds on research, support, and work to get the bill into law, and that is only the start of implications (Heubeck, 2023). California law now states that a panel of experts will approve a list of screening instruments by December 31, 2024. Immediately following, local school boards or education agencies are required to adopt one or more screening instruments from the list on or before June 30, 2025. Further, the bill requires local educational agencies serving pupils in kindergarten, grade one, or grade two, to assess each pupil in those grades using the adopted screening instrument, no later than the 2025-2026 school year (California Senate Bill 114, 2023). These implications are extensive for school sites, and the work does not stop there. Schools will be required to expend professional development, training, and support for classroom teachers and other staff to administer the screening process. In addition, schools will need to write policies themselves for the administration of screening as well as follow-up actions and ongoing benchmarks.

Directions for Future Study

For future study, a comprehensive evaluation of screening tools is recommended to establish a best-practice screener. This study could be conducted by the International Association for Dyslexia or another relevant Federal agency. In Ohio alone, there are seven screening tools that make the state’s approved list of universal screening tools. Each school then must decide which of the screening tools they will utilize. Although options are beneficial in education, this also presents additional work and practice to decide on

implementation. A team of educators would need to review and evaluate each screening tool for efficacy, cost, staffing, and training decisions. Many of these stakeholders would be new to the process themselves, thus they would not necessarily be experts in making these decisions.

In considering other areas for future study, limitations of this research project include the inability to isolate reading scores down to universal screening as the only variable considered. With universal screening now mandated in 41 states, there is consensus that this practice is a valuable step in supporting all students in their pursuit of learning to read. However, it has proven difficult to isolate how, unilaterally, the practice of early screening for dyslexia in early grades (PK-3) impacts the reading scores of those students in third grade. For future study, a case study approach would be beneficial to this field of research. For example, with California requiring early screening beginning in the 2024-2025 school year, a case study approach could be implemented to follow a sample of Kindergarten students who go through the early screening process, identifying students that are flagged as at-risk for dyslexia. The case study would document specific results for these students as well as support plans put in place by their educational staff. From there, the students would be followed and benchmarked quarterly to determine the accuracy of the early screening as well as monitor progress for the intervention methods put in place. In theory, providing the support needed for these students should positively impact their third grade reading scores. Looking at reading scores alone does not present the full picture. Rather, there would need to be observations by educators as well as more qualitative information to augment the findings that are presented with the reading scores.

Summary

Early and universal screening for dyslexia is recognized by researchers as an important first step in the process of supporting all students in learning to read. The process of universal screening is multifaceted, impacting classrooms nationwide. Additionally, there are significant implications for state, district, and local policy makers, as well as significant financial expenditures required to fulfill this endeavor. The stakes are high, as third grade reading scores are the single greatest predictor in future success in school. Addressing any challenges that prevent students from learning to read early and universally will pave the way for support and intervention to take place. Although costly, these endeavors made early could prevent future costs both financially to the education system as well as emotionally to students and families. Educators must do their part not only to comply with state mandates, but also to support each and every student to the best of their ability.

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Post-Pandemic Education: An Exploration of Declining Middle School Math Achievement

Svetlana V. Sushch

Abstract

This project explores three variables that contributed to the decline of math achievement in California middle school students during and after the outbreak of the Coronavirus-19: math anxiety (MA), math home environment (HME), and intervention strategies. The problem is that these factors created gaps in math learning due to the rapid shift to online learning; these gaps consequently served as barriers that kept students from reaching their grade-appropriate state standards, keeping them from being adequately prepared for high school math. To fill these gaps and get students to reach their grade appropriate state standards, parents should be more involved in their child's math learning at home by providing effective autonomous support. Teachers should implement Tier 1 and Tier 2 intervention strategies in their daily instruction so that they reach students who struggle with understanding math while still supporting the students who may not struggle with math. Teachers should be provided opportunities for professional development and training that will better prepare them for future outbreaks that may force online education. Teachers should also be provided resources that can be used to both preload and accelerate student math learning so that students can reach their grade appropriate standards before moving onto high school. Bandura's Theory of Self-Efficacy (1993) served as the theoretical underpinning for the project.

Chapter 1: Introduction to the Project

Background

The National Assessment of Educational Progress (NAEP) was first administered in the United States in 1969 to assess student progress and improve education based on nationwide results. Because the NAEP has not been altered much since its first administration, it is known as "the Nation's Report Card" (National Center for Education Statistics, 2023), providing a longitudinal snapshot of student academic success. Data results from NAEP have shown a decline in overall student achievement, where thirteen-year-olds dropped nine points in mathematics and four points in reading between the academic years of 2019-2020 and 2022-2023 (Schwartz, 2023). This decline is the greatest yet since NAEP was first administered.

In the spring of 2020, education was forced to rapidly transition into

online learning due to the outbreak of the novel Coronavirus-19 disease (COVID-19). School districts throughout the globe were challenged with the task of effectively transitioning nearly 55.1 million K-12 students from traditional face-to-face learning to distance (or online) learning (Randolph & Leping, 2022). Students and teachers were not equipped with the sufficient knowledge and skills that came with online learning, therefore, many barriers surfaced with this abrupt transition. Teachers struggled to utilize the necessary technology to teach virtually, while students showed less effort with online learning (Bond, 2020; Doz & Doz, 2023; Mailizar et al., 2020). Schools sought solutions that would continue effective student distance learning, such as providing printed material and various online apps and resources (Bond, 2020). However, due to the multiple mutations of COVID-19 and, consequently, the prolonged period of distance learning, academic achievement as measured by final mean GPAs, showed a decline during the pandemic (Randolph & Leping, 2022).

Statement of the Problem

According to the California Department of Education (CDE) (2023b), as measured by the California Assessment of Student Performance and Progress (CAASPP), math achievement in California middle school students took a toll during the outbreak of COVID-19. In the academic years of 2014-15, 2015-16, 2016-17, 2017-18, and 2018-19, 33.03%, 36%, 36.61%, 37.09%, and 37.24% of students met or exceeded California standards for math, respectively. Thus, there was a steady increase in students who met or exceeded math standards before the pandemic from 2014 to 2019. Students were not assessed in 2019-20 due to the outbreak of the pandemic but resumed assessments in the academic years of 2020-21 and 2021-22. The two years after the pandemic showed a decline in math achievement with a respective 32.60% and 30.64% of students meeting or exceeding math standards (CDE, 2023b). Right before the pandemic, 37.24% of California middle school students met or exceeded California math standards; right after, the percentage dropped by 6.6% to 30.64% of students meeting or exceeding state standards.

The effects of COVID-19 created a gap in mathematics learning, which is problematic because of the sequential nature of mathematical learning (Sattem et al., 2022). For example, to understand how to divide fractions, a student must first understand what a reciprocal is and how to multiply fractions. In order to understand how to multiply fractions, a student must first understand the anatomy of a fraction, and so on. Therefore, students who have gaps of understanding in math due to the rapid transition to online learning must first address those gaps to move forward and reach their current standards (Sattem et al., 2022). The problem is that teachers are tasked with deciding whether to focus on these gaps via intervention strategies or move on with the current curriculum. When teachers focus on the gaps via intervention

strategies, students are held back from the material they should be learning in their current grade level. When teachers move on with the current curriculum without addressing the gaps, students are not equipped with the necessary skills to advance their mathematical understanding. This dilemma, in addition to the difficulties that student home life and math anxiety produce, contributes to the decline in post-COVID math achievement (Bond, 2020). Due to this decline in post-COVID math achievement, California middle school students are not reaching the appropriate math standards for their grade level.

Purpose of the Project

This project aims to explore the pandemic academic foundations that contribute to the decline of math achievement scores in California middle school students. The three variables investigated are the effects of the home environment, math anxiety, and intervention strategies on math achievement scores. There exists a gap in research of these variables as they pertain to middle school students. Thus, this investigation is critical to the efforts to mitigate the overall decline of math achievement and ultimately equip California middle school students to reach their appropriate math standards. Parents and teachers need to collaborate to prioritize filling the gaps in mathematical understanding created during the pandemic and simultaneously introducing the current grade-appropriate material. Without filling in these gaps, students are not equipped with the necessary skills to move on with their mathematical learning; this is especially true because of the sequential nature of mathematics (Sattem et al., 2022).

The research questions for this project are as follow:

1. How does the home environment affect math achievement levels of middle school students?
2. How does math anxiety of both students and parents affect math achievement levels?
3. How do intervention strategies fill the gaps created during the pandemic so students reach their grade-appropriate math standards?

Theoretical Framework of the Project

Self-efficacy is believing in one's own ability to achieve academic goals through various, inevitable challenges. Bandura (1993) emphasized the contribution of self-efficacy to cognitive development and functioning. Cognitive development entails much more than the processing, organizing, retention, and retrieving of information; it is heavily influenced by perceived self-efficacy. One with stronger self-efficacy sets higher goals with greater determination to take on the challenges that may come when working towards those goals (Bandura, 1993). Furthermore, individuals with stronger self-efficacy will imagine and focus on the positive outcomes to their work, while the individuals with weaker self-efficacy focus on the doubts; it is much more difficult to

reach a goal with strong self-doubt.

The Theory of Self-Efficacy is evident in the academic realm, specifically in the education of mathematics. In a study conducted by Collins cited by Bandura (1993), three students of low, medium, and high mathematical ability were given difficult problems to solve. Within each of these levels, the students with higher self-efficacy performed quicker and better than the students who had self-doubt; they also decided to rework the problems that they struggled with instead of giving up when they realized they failed (Bandura, 1993). Thus, greater self-efficacy develops motivation, courage, dedication, and resilience in students, making their recovery from academic failures quicker and more meaningful (Martono, 2022). Learning mathematics is full of failure, misunderstanding, and confusion that often leads to students giving up after being discouraged for not immediately getting the right answer or understanding the processes. This lack of self-efficacy is especially evident in post-pandemic middle school students who are not equipped with the skills to reach their grade-appropriate standards due to the gaps that were created during online learning. Students with low self-efficacy who recognize the barriers that these gaps have set up get discouraged and give up instead of trying to break through such barriers.

Recall the three factors that affect math achievement scores to be explored in this project: the home environment, math anxiety, and intervention strategies. A child's home environment contributes immensely to their levels of self-efficacy and, therefore, their mathematical performance. A student's home life has the power to greatly contribute to either the destruction or buildup of their self-efficacy and, in turn, their math achievement. Furthermore, math anxiety is negatively related to math self-efficacy; the lower the math self-efficacy a student has, the greater the math anxiety (Doz & Doz, 2023). When a student does not possess the courage and motivation that self-efficacy brings, they experience anxiety when they approach mathematical problems, especially after they fail with their first attempt. Intervention strategies completely rely on the self-efficacy of students and teachers. Students who undergo intervention with courage and are led by teachers that also possess confidence in their teaching strategies are better equipped to effectively overcome hurdles, which will ultimately lead to higher math achievement scores (Bandura, 1993). Thus, intervention proves to be significantly more effective when it is supported by high levels of self-efficacy in teachers and students. Bandura's (1993) theory of self-efficacy is evident and rooted in the investigation of the three variables and their impacts on the decline of math achievement in California middle school math students.

Definition of Key Terms

For a better understanding of this project, the following terms are defined in the context of this research:

California Assessment of Student Performance and Progress (CAASPP)

System: a summative assessment system established on January 1, 2014, for English Language Arts/Literacy (ELA) and mathematics. This online assessment is administered in the spring to students in grades three through eight and eleven. These scores are used to promote high-quality teaching and learning by assisting students, parents, teachers, administrators (California Department of Education, 2023a).

California Common Core State Standards Mathematics (CA CCSSM): these standards define what students are expected to understand and be able to do in their specific grade level. These standards prepare kindergarten through eighth grade students for higher mathematical education and ninth through twelfth grade students for college and career readiness. The progressive nature of the standards revolves around three major principles: focus, coherence, and rigor (CDE, 2023c).

Coronavirus disease (COVID-19): a disease caused by the virus SARS-CoV-2 whose outbreak caused a global pandemic beginning in 2019. This rapid outbreak necessitated the quick transfer to online education (Randolph & Leping, 2022).

DataQuest: “the California Department of Education’s web-based data reporting system for publicly reporting information about California students, teachers, and schools. DataQuest provides access to a wide variety of reports, including school performance, test results, student enrollment, English learner, graduation and dropout, school staffing, course enrollment, and student misconduct data” (CDE, 2023b, DataQuest, para. 1).

Distance learning: Due to the outbreak of COVID-19, thus learning modality was adapted in order to prevent the further spreading of the disease. Students and teachers rapidly shifted to virtual learning and teaching (Doz & Doz, 2023).

Grade point average (GPA): a standardized measurement of measuring academic achievement in the United States of America that ranges from zero to four.

Intervention strategies: strategies that focus on filling gaps in mathematical understanding that are necessary to move on to the next grade level.

Math anxiety (MA): a form of anxiety that generates tension, fear, and worry, math-related activities, resulting in a negative effect on math success (Retanal, et al, 2021).

Middle school: 7th and 8th grade.

National Assessment of Educational Progress (NAEP): an assessment system that was first administered in the United States in 1969 to assess student progress and improve education based on nationwide results. It is administered to fourth, eighth, and twelfth grades. The NAEP has not been altered much since its first administration, making it known as “the Nation’s Report Card” (National Center for Education Statistics, 2023).

Self-efficacy: “people’s beliefs about their capabilities to exercise control

over their own level of functioning and over events that affect their lives (Bandura, 1993, p. 118). In the educational context, self-efficacy is believing in one’s ability to achieve academic goals through various, inevitable challenges.

Summary

The rapid transition of in-person education to online education threw teachers and students into a frantic effort to keep effective teaching and learning through and after the pandemic. However, due to the unexpectedly prolonged pandemic, teachers and students were not readily equipped for the barriers that arose with the rapid shift, resulting in an over decline in academic achievement. Overall GPA scores, NAEP results, and CAASPP scores dropped between the academic years before and after the pandemic. More specifically, California middle school math achievement took a 6.6% drop in CAASPP scores and a nine-point drop in NAEP scores. The problem is that these drops in scores reflect the gaps that were made during online learning; these gaps must be addressed and filled so that students can raise math achievement scores and meet their grade-appropriate math standards.

Bandura’s (1993) theory of self-efficacy serves as a foundation for addressing this problem because effective learning is more than simply retaining information. According to Bandura (1993) and Martono et al. (2022), it takes courage, motivation, and belief in oneself in order to reach academic resilience and, consequently, academic success. Thus, the theory of self-efficacy must be considered when addressing the problem researched in this project.

There is a gap in research for the variables contributing to the post-pandemic decline in middle school math achievement scores. Thus, this project focuses specifically on California middle school students. Chapter Two of this project explores the three variables of the decline in math achievement: the home environment, math anxiety, and intervention strategies. Chapter Three summarizes the project research, analyzes implications, and proposes possible solutions to the problem researched in this project.

Chapter 2: Review of Related Literature

Introduction

The outbreak of Coronavirus-19 forced a rapid transition from traditional in-person learning to online learning. With teachers, parents, and students not being equipped with adequate knowledge and skills to maintain effective education during this prolonged transition, academic achievement took a toll. According to the National Assessment of Educational Progress (NAEP), thirteen-year-olds dropped nine points in mathematics and four points in reading between the academic years of 2019-2020 and 2022-2023 (Schwartz, 2023). Because of the sequential nature of mathematical learning, the gaps created during these drops in academic performance need to be addressed before students can meet their grade-appropriate state standards.

A gap in the literature revealed the impact of the pandemic on California middle school math achievement. The California Assessment of Student Performance and Progress reported a 6.6% drop in middle school students who have either met or exceeded their grade-appropriate mathematics standards since the COVID-19 outbreak. This literature review explored the effects of the home environment and math anxiety on math achievement, as well as intervention strategies that aim to recover student mathematical academic loss.

The Effects of the Home Environment on Math Achievement

Throughout the outbreak of the pandemic, teachers, students, and parents attempted to keep teaching and learning on track. Parents experienced barriers that made it difficult to provide the necessary guidance to their children's learning at home (Bond, 2020; Randolph & Leping, 2022; Baldemir & Tutak, 2023). Access to resources and technology as well as parental involvement and engagement with their child's learning were the primary familial factors that influenced learning during the pandemic (Bond, 2020). Because students were primarily learning at home, their home environment greatly affected their academic achievement, specifically their mathematical achievement. Due to the uniqueness of each student, various factors were found to contribute to their math achievement. Even if students shared similar cultural or socio-economic backgrounds, their home environments could differ greatly, resulting in varying levels of math achievement (Sonnenschein & Stites, 2022). Parental involvement (or the lack thereof), the education level of the parent, and the socioeconomic status of the home are three factors that have contributed to the levels of mathematical achievement, especially during the pandemic (Daucourt et al., 2021; Khanolainen et al., 2020). Bandura's theory of self-efficacy highlighted the impact that one's belief in one's own abilities can have on their academic performance and achievement (Bandura, 1993). Within the three factors that have contributed to mathematical achievement, the self-efficacy of the parent possessed tremendous power to contribute to their child's learning at home; the parents' attitude and comfort levels towards mathematics had an influence on the attitude and comfort level of their child. Consequently, the achievement levels of the child were affected (Daucourt et al., 2022).

Parental Involvement

Research has shown that a child's primary math knowledge developed when they engaged in math-related activities in low-stakes settings and manners. This setting was often at home, dictated by the home math environment (HME), "which encompasses all math-related interactions among parents and children in the home, including informal board games playing, parent's expression of their math related attitudes, beliefs, and expectations, using words that

compare magnitudes (e.g., more, less), and other math-related exchanges and utterances" (Daucourt et al., 2021, p. 1). There are two types of HME activities: direct or formal (e.g., counting, practicing math flash cards) and indirect or informal (e.g., playing board games, cooking) (Daucourt et al., 2021; Khanolainen et al., 2020). The frequency of these HME activities depended on the parental comfort level and attitude towards mathematics, which consequently influenced the child's beliefs about their mathematical abilities, further affecting their overall math performance (Daucourt et al., 2021). With increased mathematical confidence and self-efficacy towards math-related activities, parents were better equipped to support their children at home; consequently, their children's self-efficacy increased and resulted in higher mathematical achievement.

In their study of the effects of homework helping styles, Retanal et al. (2021) focused on the differences between autonomy support and controlling support. Autonomy-supportive parents "allow[ed] their children to explore their environment, initiate their own behavior, and encourag[ed] their children to take an active role in problem solving," while being readily available to assist when assistance was initiated by the child (Retanal et al., 2021, p. 2). Drawing from research, the autonomy-supportive practices of homework assistance have contributed to higher levels of math achievement both directly and indirectly. On the other hand, when parents took a more controlling route in homework help at home, they often did the work for their child or dictated exactly what their child is to do, rarely asking for the child's input for mathematical discussion. Thus, there was less contribution to the child's learning and application of mathematical skills that they learned in the classroom. Furthermore, children who struggled more with math tended to prompt more controlling support from their parents, thus contributing to the lowering of their math achievement (Khanolainen et al., 2020; Retanal et al., 2021).

Socioeconomic Status

When children engaged in mathematical conversations and activities with their parents at home, they received extended exposure to mathematics which was found likely to increase their math understanding and consequently, achievement (Daucourt et al., 2022). These academic activities connected what the students learned at school to their home environment, which increased the child's development. When connecting mathematical concepts to practical application at home by having greater math expectations and practicing more math-focused skills at home, parents may have created strong ties between home and school (Daucourt et al., 2022). Instead of coming home and forgetting all the math skills the student had attained each day, students came home to review or extension of mathematical concepts. When there was a weak or nonexistent tie between the math learned and the home environment, the child experienced less development, which did not contribute to their overall math achievement (Daucourt et al., 2022).

During the pandemic, the attitudes of families towards online learning was influenced by their household income: families with lower monthly average incomes had a significantly lower attitude than those with a higher monthly average income (Baldemir & Tutak, 2023). Students from lower-SES households were less likely to complete and return homework (Bond, 2020). Research has specifically highlighted the existence of SES-related math achievement gaps. Families that were socioeconomically disadvantaged tended to have less access to math-related resources that could be used for math support at home. One of these resources was time to engage in stimulating, mathematical interactions that could equip children with math skills that they could apply in the classroom to increase math achievement. Because the parents of students in low socioeconomic homes were often working multiple jobs to alleviate socioeconomic strain, they had less time to help their child at home with math-related activities. Additionally, research showed that high SES-parents provided more math-related interactions during play time than low SES-parents, increasing their exposure and practice of math-related skills (Daucourt et al., 2021).

Particularly when COVID-19 forced the transition from in-person to online learning, education became heavily reliant on technology. The socioeconomic status of students' homes dictated whether or not they had access to the technology necessary to engage in online learning; many households were not able to afford new equipment or fix the equipment that they did have. Thus, these students were less likely to complete and turn in their work, resulting in a lowering of their math achievement during the outbreak (Bond, 2020). It is significant to note that many researchers believe that the level of education of the child's parent served as "significant predictors of the children's arithmetic fluency" (Khanolainen et al., 2020, p. 12). Research has also shown that parents with low SES and low educational level often regarded parent-school communication as unimportant, especially during the pandemic; this resulted in an overall lack of collaboration between the parent and teacher (Baldemir & Tutak, 2023).

Parental involvement and the socioeconomic status in the child's home both contribute to the Home Math Environment (HME). The quality of parental support, the parents' education level, and socioeconomic status of the home all contribute to the self-efficacy of the student and consequently, to the math achievement of California middle school students.

The Effects of Math Anxiety on Math Achievement

Math anxiety (MA) is defined as feelings of stress, fear, and frustration towards mathematics-related activities (Doz & Doz, 2023; Gecici & Bayirli, 2022; Madjar et al., 2018). MA has been widely documented across all countries and through many age ranges, making it a global problem (Kamour & Altakhayneh, 2021; Oh et al., 2022). Approximately 17% of the general pop-

ulation underwent great levels of MA and 31% of 15 year old students felt powerless or nervous when they engaged in math tasks (Doz & Doz, 2023). Research within middle schools has revealed the detrimental effect that MA has on math achievement, as well as its negative relationship with self-efficacy; some of the most intense negative relationships between MA and math achievement have been found specifically in middle schools (Doz & Doz, 2023; Retanal et al., 2021). Students with greater MA tended to avoid math-related career paths and score lower than their less anxious peers on math-related tests (Retanal et al. 2021). Additionally, even though middle school students experienced great fear and worry towards their math performance and achievement, they were not diagnosed with an anxiety disorder as determined by clinical psychiatric diagnostic requirements (Madjar et al., 2018). Thus, students who were not diagnosed with anxiety had to deal with MA without further clinical intervention, resulting in their lower math achievement. Both at home and in the classroom, the MA levels of the child were found to be affected by the parent's MA and the quality of the teacher, which consequently contributed to the mathematical achievement of the child.

Self-Efficacy

According to Bandura (1993) in his theory of self-efficacy, there was much more to learning than simply memorizing facts and applying what was learned; learning was greatly affected by a student's self-efficacy, or one's belief in their own ability to achieve academic goals through various, inevitable challenges. Thus, when a student lacked self-efficacy, they were less likely to push through the difficulties within the study of mathematics and more likely to give up with any sign of failure. On the other hand, students with stronger self-efficacy tended to push through the barriers and try again, even in the face of various failures. One of these barriers came in the form of math anxiety, which served as a detriment to mathematical achievement in middle school students.

Doz and Doz (2023) conducted a study in which they investigated the impact of distance learning on levels of math anxiety among middle school students. Within their study, Doz and Doz (2023) emphasized the negative relationship between MA and one's math self-efficacy; the greater the levels of MA that a student experienced, the less self-efficacy they possessed in regard to mathematics-related activities. The anxiety that was induced when students with math anxiety approached mathematical situations affected their belief in their abilities, thus reducing their academic performance. Furthermore, their study revealed a negative relationship between MA and math achievement both before and during the pandemic (Doz & Doz, 2020). In their study of the relationship between attitude towards mathematics and MA, Gecici and Bayirli (2022) found that when students had a positive attitude towards mathematics, their achievement increased and when their achievement increased, so did their attitude towards mathematics, lessening their MA. Furthermore,

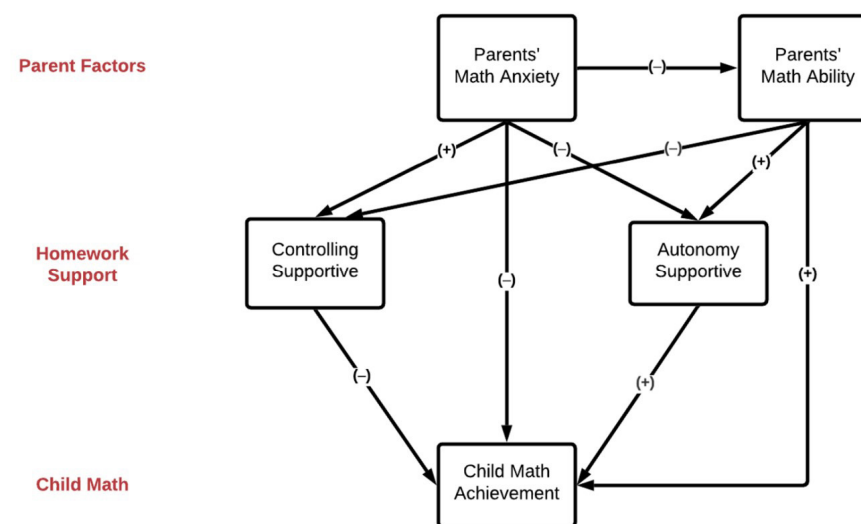
Martono et al. (2022) argued that student success relied heavily on their ability to develop academic resilience; the results of their study showed a positive relationship between self-efficacy and academic resilience. Thus, math anxiety has been found to create a negative impact on students' attitude toward mathematics, which in turn reduced their overall mathematics achievement and academic resilience (Martono et al., 2022).

Parental Math Anxiety

In addition to the student's level of math anxiety (MA), the MA levels of the parent also contributed greatly to the overall math achievement of the student. In general, parents who possessed more confidence and comfort towards math-related activities tended to embed math into the social interactions with their children at home (Daucourt et al., 2021). However, it is also important to note that Daucourt et al. (2021) highlighted that because of the often-indirect relationship between social activity and mathematical skill, these interactions may not have necessarily contributed to the specific math skill development. Regardless, when parents with greater levels of math anxiety helped their child with their math homework, that child's mathematical achievement tended to lower throughout the school year (Oh et al., 2022). Furthermore, more math-anxious parents may have become increasingly controlling with their children instead of establishing a sense of autonomy regarding understanding and completing their math homework (see Figure 1) (Retanal et al., 2021). This may be because the parent lacked the confidence and self-efficacy to effectively help their child; they did not believe they possessed the mathematical skills necessary to successfully help their child due to their feelings of tension and fear towards math-related activities (Oh et al., 2022).

Figure 1

Theoretical Model Summarizing Expected Relations Among Parent Factors, Homework Helping Styles and Child Math Achievement



Note. The (+) and (-) indicate predicted respective positive and negative pathways. From “Controlling-supportive homework help partially explains the relation between parents’ math anxiety and children’s math achievement” by Retanal et al., 2021, *Education Sciences*, 11.

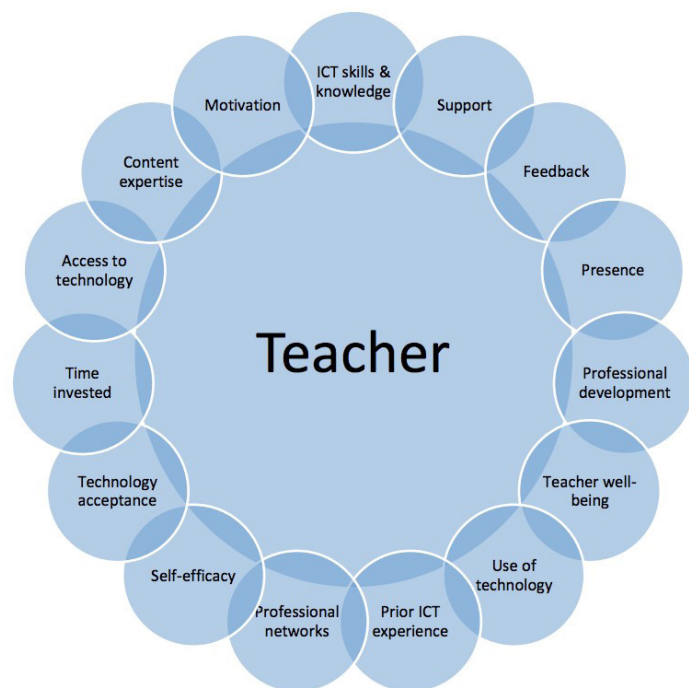
Quality of Teacher and Teaching Methods

As discussed, the math anxiety of the mentor in the student's life may have negatively affected the learning of the mentee (Retanal, 2021). At home, this mentor was the parent or guardian of the child and at school, the institution and teacher served as the mentors. Research has shown that “institutional support improves optimism in students’ thinking and thereby, reduces their anxiety. These students have higher academic resilience” (Martono et al., 2022, p. 11). This was especially true when institutional support was available in such a way that students believed that it would genuinely support them. In their extensive, quantitative study of MA before and during the COVID-19 outbreak, in their research, Doz and Doz (2020), found a significant and negative correlation between MA and the students’ satisfaction with the teaching methods. However, it is important to note that this consistent negative relationship before and during the pandemic indicated that students were rather consistently satisfied with the teaching methods of their teachers regardless of the learning environment, be it online or in-person.

Furthermore, study results showed that healthier teacher-student

relationships and higher satisfaction with the teachers' teaching methods correlated to lower MA levels in the students; this correlation was even stronger during online learning (Doz & Doz, 2020). As shown in Figure 2, there were many influences that the teacher possessed which may have impacted the levels of MA of students, specifically during the pandemic. One of these influences was teacher self-efficacy. In a study conducted by Gibson and Dembo cited by Bandura (1993), it was found that "teachers who [had] a high sense of instructional efficacy devote[d] more classroom time to academic learning, provide[d] students who have difficulty learning with the help they need to succeed, and praise[d] them for their accomplishments" (Bandura, 1993, p.140). Teachers' belief in themselves predicted their students' levels of mathematical achievement throughout the academic year; teachers with low self-efficacy were more likely to undermine the students' self-efficacy and cognitive development (Bandura, 1993). Additionally, students have reported influxes of MA when the following three factors were repeatedly present in the classroom: time limitations, the pressure of expectations, and teacher authority (Gecici & Bayirli, 2022).

Figure 2
Teacher Influences on Teaching and Learning



Note. From "Schools and emergency remote education during the COVID-19 pandemic: A living rapid systematic review" by Bond, M. 2020, Asian Journal of Distance Education, 15(2), 191-247.

The math anxiety (MA) levels of the child, both at home with the parent and at school with the teacher, may have significantly impacted children's math achievement. The self-efficacy of the parent and teacher impacted the self-efficacy of the student, which may have impacted the child's math performance and achievement.

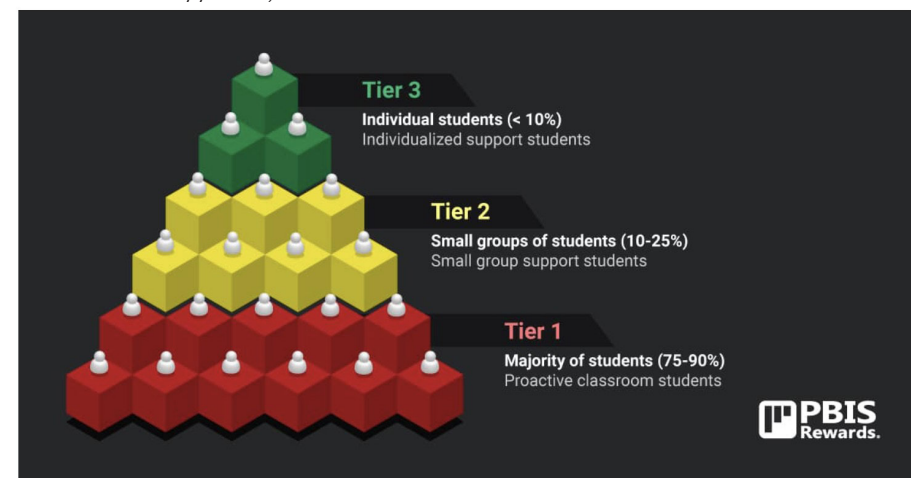
Mathematical Intervention Strategies

Throughout middle school, students were prepared with the necessary algebra coursework to continue rigorous mathematics courses in high school. Most high schools in the United States require students to pass an algebra course to graduate, algebra being the gatekeeper to upper-level mathematics (Powell et al., 2021). Thus, intervention implementation was critical to increasing student mathematical achievement by getting them to reach their grade-appropriate math standards before entering high school. Intervention strategies based on the Multi-Tiered Support System (MTSS) aimed to fill the gaps that COVID created in the mathematical learning of middle school students. Additionally, student and teacher self-efficacy contributed to the effectiveness of the intervention strategies.

Multi-Tiered Support System

Over the past two decades, one of the most adopted forms of intervention came through the multi-tiered support system (MTSS); this system was designed so that the needs of all students were met, and the supports increased in intensity based on the needs of the student (Jitendra et al., 2021; Sutherland et al., 2023). See Figure 3 for the breakdown of the percentages and categories of the three tiers that make up MTSS.

Figure 3
Multi-Tiered Support System



Note. From "What is MTSS?" by PBIS Rewards (2023). <https://www.pbisrewards.com/>

blog/what-is-mtss/

With the goal of decreasing or eradicating achievement gaps, schools sought to identify students at risk for academic or behavioral intervention (Sutherland et al., 2023). Students who demonstrated this academic risk possessed lower levels of self-efficacy and were, therefore, less motivated to increase their mathematical understanding, even though the intervention was provided to them (Bandura, 1993). This literature review focused primarily on the pros and cons of Tier Two intervention, which was “intended to provide supplemental, strategic instructional support to students demonstrating some academic risk for whom core instruction may be insufficient” (Jitendra et al., 2021, p. 308). Specifically, academic risk increased rapidly after the transition from in-person to online learning when gaps were created in student mathematical learning (Sattem et al., 2022). Math achievement levels in California middle school took a toll, requiring intervention strategies to recover from the loss (CDE, 2023b; Schwartz, 2023).

Tier Two Intervention

Within math intervention in middle schools, three models were prevalent in the attempt to increase math achievement within the second tier: the withdrawal of small groups, an alternative math class, and additional mathematics instruction or class (Bouck et al., 2019).

Researchers have seen the positive effects that taking a second math class have had on students; this was because of the pairing of the current, grade-level mathematics class with another class that addresses the gaps that may have developed in mathematical understanding or skill (Bouck et al., 2021). This extra math class may be especially helpful in filling the gaps of the unfinished learning that the outbreak of COVID-19 created with the rapid shift to online learning. This intervention strategy required that teachers “identify skill gaps with precision while also maintaining high grade-level ambitions for students with those gaps (Sattem et al., 2022, p. 11).

Criticism of the Tier Two support in secondary education stemmed from the lack of personnel to provide the intervention as well as the drawback of having students being pulled from their general education classes in order to receive this intervention (Bouck et al., 2019; DeFouw et al., 2023). Students were missing the chunks of lessons that created more gaps within those missed classes (Bouck et al., 2019). Within the United States, several studies have highlighted the negative relationship between increased class sizes and student math achievement; this was because when class sizes were smaller, teacher-student interactions increased and more personalized support was available (Sutherland et al., 2023). As for intervention classes (i.e. math labs), the teacher-student ratio was also an issue; ideally, these math labs would be smaller in size so that intervention is more personalized and consequently more effective in increasing math achievement. Researchers highlighted recommendations on how to keep intervention implementation in math labs effective in Table 1. In their study of the impact of optimism, self-efficacy, and

motivation to academic resilience, Martono et al., (2022) emphasized the power that institutional support had on student achievement: “...if institutional support [was] available and students [had] the perception that the management and teaching will consider their issues as well as help them overcome their problems, they [did not] lose hope” (Martono et al., 2022, p. 11). Thus, the institutional implementation of these intervention strategies increased student self-efficacy and consequently their academic achievement.

Table 1

Recommendations for Implementing a Middle School Tier 2 Math Lab

Do	Don't
<ul style="list-style-type: none"> • Schedule the Tier 2 math lab to occur before the students' general education Tier 1 math class, so the focus can be on pre-teaching. 	<ul style="list-style-type: none"> • Make the focus of the class on doing the “homework” for the Tier 1 class or just worksheets that <i>drill and grill</i> facts, rules, and procedures.
<ul style="list-style-type: none"> • Focus on building and developing students' conceptual understanding, not the memorization of facts and procedures. 	<ul style="list-style-type: none"> • Make the Tier 2 math lab the only math class students receive; all students receiving a Tier 2 math lab should also receive a Tier 1 math class.
<ul style="list-style-type: none"> • Implement evidence-based strategies for teaching and supporting students. 	<ul style="list-style-type: none"> • Make class size as large as Tier 1 classes. Large classes defeat the purpose of a Tier 2 math lab.
<ul style="list-style-type: none"> • Work for students to have the same teacher for their Tier 2 math lab and their Tier 1 class. 	<ul style="list-style-type: none"> • Have courses taught by teachers who are not knowledgeable in mathematics and the teaching and learning of mathematics.

Note. From “*Supporting Middle School Students in Tier 2 Math Labs: Instructional Strategies*,” by E. Bouck et al., 2019, *Current Issues in Middle Level Education*, 24(2). (<https://doi.org/10.20429/cimle.2019.240203>).

Explicit Instruction

Powell et al. (2021) highlighted six instructional strategies that aimed to increase math achievement: explicit instruction, use of multiple representations, problem-solving instruction, a language component, use of mnemonics, and use of graphic organizers. Explicit instruction has been defined as “a form of systematic instruction in which the teacher first models how to solve a mathematics problem, then cues students to solve the problems, and last allows the student to solve problems independently” while providing feedback throughout (Bouck et al., 2019, p. 23; Powell et al., 2021). Many researchers have highlighted the effectiveness of explicit instruction as an intervention strategy. Though explicit instruction is not recommended for all mathematical teaching and learning in the general education setting, it is for students who

struggle in mathematics (i.e., students who receive Tier two support) (Bouck et al., 2019). Thus, when teachers were tasked with filling the gaps in learning that COVID-19 created, explicit instruction was one of the intervention strategies used.

The math intervention strategies based on the MTSS have been applied to increase math achievement in middle schools. Specifically, within the Tier Two supports, these strategies came in the form of the withdrawal of small groups, an alternative math class, additional mathematics instruction or class, and explicit instruction. These strategies all aimed to increase math achievement levels by filling the gaps that the outbreak of COVID-19 created.

Summary

The California Assessment of Student Performance and Progress reported a 6.6% drop in middle school students who have either met or exceeded their grade-appropriate mathematics standards since the COVID-19 outbreak. This literature review explored the effects of the home environment and math anxiety on math achievement, as well as intervention strategies that aim to recover student mathematical academic loss. This is important for this study because these factors can contribute to the increase of mathematical achievement and the filling of gaps that were created during the pandemic. Consequently, California middle school students may reach their grade-appropriate standards and move into high school with the mathematical skills necessary to pursue success after graduation. Chapter Three will summarize the project research, analyze implications, and propose possible solutions to the problem researched in this project.

Chapter 3: Implications

Introduction

Extensive research has been conducted on the impact that COVID-19 had on math achievement in middle school students. Because of the rapid transition from traditional in-person education to online learning, teachers and students were not readily equipped to keep teaching and learning effective; this resulted in an overall decrease in math achievement (Bond, 2020; Doz & Doz, 2023; Mailizar et al., 2020; Randolph & Leping, 2022). Furthermore, the math home environment (HME) greatly influenced the math achievement of the child due to the varying levels of parental involvement and the socioeconomic status of the home (Daucourt et al., 2021; Khanolainen et al., 2020; Sonnenschein & Stites, 2022). Research has also highlighted the negative effect that math anxiety (MA) has on math achievement (Doz & Doz, 2020). The purpose of this project was to present literature that explored the pandemic

academic foundations and contributed to the decline of math achievement scores in California middle school students.

Conclusions

The outbreak of COVID-19 had a negative impact on mathematics achievement in California middle school students. Overall GPA scores, NAEP results, and CAASPP scores dropped between the academic years before and after the pandemic. More specifically, California middle school math achievement took a 6.6% drop in CAASPP scores and a nine-point drop in NAEP scores (CDE, 2023b; Schwartz, 2023). The problem is that the gaps in mathematical learning that were reflected through these declines created barriers that kept students from reaching their grade-appropriate standards. Therefore, these gaps must be addressed so that students can reach their grade-appropriate math standards before moving on to high school.

One of the most significant contributors to this decline in math achievement is MA levels. Various studies show an increase of MA during the distance education that was in place during the COVID-19 pandemic; this is because “distance education requires to have adequate digital devices and a stable internet connection, it involves time limited submission of assignments, and it is characterized by a reduced teacher-student interaction” (Doz & Doz, 2023, pg. 5). These factors may limit students’ math learning and understanding, in turn generating higher MA levels. Research highlights the following relationships: the greater the MA levels of the child, the lower their overall math achievement (Doz & Doz, 2023); the greater the MA levels of the child, the lower their self-efficacy (Bandura, 1993); the greater the self-efficacy of the child, the greater the academic resilience of the child (Martono et al., 2022); the greater the MA of the parent, the lower the math achievement of their child (Oh et al., 2022). These relationships highlight the negative impact that MA had on math achievement and how critical the self-efficacy of both the parent and child is to the overall math achievement of the child. Thus, it is important to increase the self-efficacy of both the parent and child so both parent and child can lower their MA; ultimately, this will increase the math achievement of the child.

Another key contributor to the overall math achievement of the child is parental involvement. When parents are not as involved in their child’s math learning at home, their child’s math understanding (and consequently achievement) declines (Khanolainen et al., 2020; Retanal et al., 2021). When parents are involved in their child’s math learning, the type of support plays a great role in their child’s math achievement. Children benefit more from autonomy support versus controlling support. The latter allows students to formulate their questions to their parents and have productive, mathematical discussions, while the former suggests that parents completed all of their child’s work with little to no engagement from the child (Retanal et al., 2021).

Thus, when parents are willing to engage in an autonomy support style at home, their child's math achievement benefits.

Research revealed that the socio-economic status of the home impacts the child's math learning; the lower SES households tend to have students with poorer attitudes towards math compared to the students in higher SES households (Baldemir & Tutak, 2023). These students are less likely to complete and return their homework assignments (Bond, 2020). Parents of low SES households are often working multiple jobs and therefore are not as involved in their child's mathematical development at home (Daucourt et al., 2021). Especially during online learning, students of families with a low socio-economic status faced technological barriers that kept them from receiving the same learning as their higher socio-economic peers because they could not afford new equipment or fix the old ones (Bond, 2020). Thus, the socio-economic status of the child greatly contributed to their overall math achievement because of these economic factors.

Practice Implications

Research supports the idea that parents should be more involved in their child's mathematics education at home; this is especially critical with students who struggle with understanding mathematics. When students come home to an environment that supports the mathematical material that the student learned at school that day, that extra exposure increases the math understanding of the child. On the other hand, when the student does not revisit the new material at home, they leave the new math knowledge in the classroom and only revisit it the next time they are in the classroom. Research has shown that this weak tie between the math learned, and the home environment consequently weakens their math achievement (Daucourt et al., 2022). Furthermore, parents should be intentional about the type of support that they provide at home. Research has shown that an autonomy support style is more effective than a controlling support style (Retanal et al., 2021). Thus, when parents are helping their children at home, they should give their children the opportunities to take an active role in problem solving and initiate productive discussions based on the material. This way, students are engaging in critical thinking that contributes to their overall development and their increase in math achievement.

In the classroom, teachers should incorporate Tier 1 and Tier 2 support in their daily instruction. Research has shown that explicit instruction, problem-solving instruction, use of multiple representations, use of mnemonics, and use of graphic organizers were intervention strategies that increased math achievement, specifically in students who struggled with mathematics (Powell et al., 2021). Thus, teachers should utilize these strategies in the general education classroom to reach all students, and specifically the students who would benefit most from intervention.

During and after the COVID-19 pandemic, teachers were not equipped with the skills that were necessary for online education. Thus, teachers must be trained for online and remote teaching through professional development (Bond, 2020; Sattem et al., 2022). This way, if another outbreak were to emerge, the transition to online learning would be smoother because teachers would be adequately trained. In addition to providing ample opportunities for professional development for teachers, "initial teacher programs also need to include targeted preparation for teaching with a range of software, across distance, online, blended and face-to-face contexts" (Bond, 2020, p. 216).

The following three strategic actions are recommended for state policy-makers in order to get students to reach their grade-appropriate math standards after the pandemic:

- State boards can make sure to have processes in place to develop a shared understanding of essential math content and standards that engage teachers, content experts, and instructional leaders in decision-making.
- States can ensure that teachers have access to high-quality math curricula and resources that support just-in-time prerequisite support and acceleration to on-grade-level instruction. [With this type of support, teachers can preload students with the math content necessary to move on and then accelerate further content so students can reach their standards in a timely manner.]
- States must provide resources for and prioritize professional development that emphasizes deep math understanding, progressions of learning, and conceptual understanding (Sattem et al., 2022, p. 11).

Critical attention and decision-making must be paid to the math instruction that is to be provided to accelerate learning in such a way that students can reach their grade-appropriate standards before falling too far behind.

Directions for Future Study

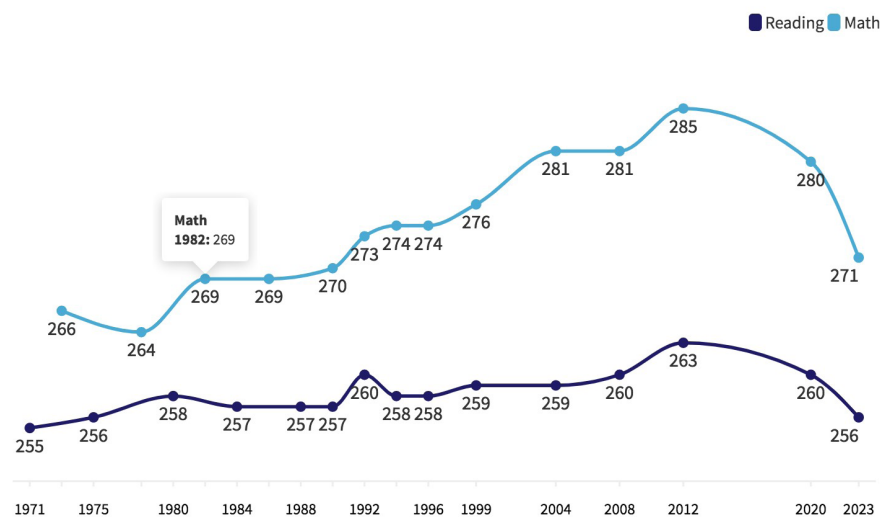
Extensive research is necessary to understand the factors that have contributed to the overall decline in California middle school math achievement. Though the home math environment (HME), math anxiety (MA), and intervention strategies are the three factors that outlined this project, other factors may have also contributed to the decline. Future studies may focus on the differences between the math achievement levels of middle school boys and girls and the effects that classroom management may have on achievement levels. Specifically with the effects of the pandemic, it would be beneficial for future studies to research the pros and cons of online learning in comparison to traditional, in-person education.

NAEP results showed a nine-point drop in mathematics and a four-

point drop in reading between the academic years of 2019-2020 and 2022-2023 (Schwartz, 2023). This decline is the greatest yet since NAEP was first administered. See Figure 4 for the progression of reading and math levels from the first administration of NAEP through 2023.

Figure 4

Trend in NAEP Long-Term Trend Reading and Mathematics Average Scores for 13-Year-Old Students



Note. From “Reading and math achievement is getting worse, nation’s report card shows” by Schwartz, 2023, Education Week.

Test results show a general decrease in students’ abilities to identify the main ideas of passages, make inferences, and locate specific information in text (Schwartz, 2023). Thus, this research can be expanded to the decline in literacy rates of California middle school students.

Summary

The global outbreak of Coronavirus-19 forced the world of education to place its best efforts to keep education productive during the rapid shift from traditional, in-person instruction to remote, online learning. Due to the abrupt nature of the outbreak, teachers, parents, students, and administrators were not readily equipped with the skillset to make the transition seamless. Thus, academic achievement levels took a toll; overall GPA scores, NAEP results, and CAASPP scores dropped between the academic years

before and after the pandemic. Math achievement, in particular, took a 6.6% drop in CAASPP scores and a nine-point drop in NAEP scores (CDE, 2023b; Schwartz, 2023). These drops created gaps in mathematical learning, which is problematic because of the sequential nature of mathematics where future learning is greatly dependent on prior learning.

This project researched the impact that the home math environment (HME), math anxiety (MA), and intervention strategies had on the overall decline of math achievement in California middle school students. The following three conclusions were made within the literature review:

- The math anxiety of both the student and their parent(s) impacts their math achievement (Doz & Doz, 2023; Oh et al., 2022).
- The parental involvement of the student impacts the student’s math achievement (Khanolainen et al., 2020; Retanal et al., 2021).
- The socioeconomic status of the home impacts the math achievement of the student (Baldemir & Tutak, 2023; Bond, 2020; Daucourt et al., 2021).

These conclusions inspire both practical and policy implications. To increase the math achievement levels of middle school students, parents should be more involved in developing a HME that supports the development of their child’s math understanding. This support should be of an autonomy style versus a more controlling style; this way, students are more involved in their own learning rather than having the parents do all the work for them (Retanal et al., 2021). In the classroom, teachers should incorporate more Tier 1 and Tier 2 intervention strategies within daily instruction. This way, the entire class is supported through explicit instruction, problem-solving instruction, use of multiple representations, use of mnemonics, and use of graphic organizers (Powell et al., 2021).

The policy implications highlight the importance of providing professional development opportunities for both new and experienced teachers in developing a skill set that can be used in future situations that may force another rapid transition to online learning (Bond, 2020; Sattem et al., 2022). States should also provide the resources and training that “emphasize deep math understanding, progressions of learning, and conceptual understanding” (Sattem et al., 2022, p. 11). This way, policy makers and teachers can collaborate to potentially accelerate student learning and get students to reach their grade appropriate state standards before moving on to high school.

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