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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.

The Journal of Epistemology - The Theory of Knowledge

Edition - Fall 25

The Impact of Inclusive Teaching Strategies on the Academic Success of Elementary Aged Students with Autism Spectrum Disorder

Abigail Allen

Abstract

Diagnoses of Autism Spectrum Disorder (ASD) are increasing annually, and students with ASD lack age-appropriate social-emotional skills and perform below grade level in mathematics and reading. This project examined inclusive teaching strategies to support elementary-aged students with ASD in developing social-emotional and academic skills. This project identified key strategies for helping students with ASD through the lens of Vygotsky's Theory of Cognitive Development. These strategies include building relationships to support social-emotional development and using manipulatives and graphic organizers to enhance mathematical and reading skills. Findings demonstrated the importance for teachers to know the strengths and needs of each student to determine the appropriate strategies to employ. Findings also suggested more professional development opportunities for general education teachers with students with ASD because they are likely to feel unprepared to manage an inclusive classroom. This project suggested future studies to focus on children with Level 3 ASD and to examine gender, race and ethnicity, and cultural differences of children with ASD in relation to positive inclusive education experiences.

Chapter 1: Introduction to the Project
Background

Elementary-aged students with autism spectrum disorder (ASD) often perform below grade level in both reading and mathematics due to many factors, including limited social-emotional skills such as social communication, emotional regulation, mental health, and other traits commonly associated with ASD (APA, 2025; Bullen et al., 2022). Many schools throughout the United States are transitioning from educating students with disabilities, such as ASD, in self-contained learning environments to inclusive learning environments (Parsons et al., 2016; Locke et al., 2021; Wang et al., 2022). When implemented effectively, inclusion benefits both typically developing students and students with ASD in social-emotional development and academic success (Fuchs et al., 2025; Kaler et al., 2024; Rolan et al., 2021). An effective implementation of inclusive education includes, but is not limited to, positive peer models, the usage of evidence based practices, and teacher self-efficacy (Paisley et al., 2022; Parsons et al., 2016). Although inclusion is an effective strategy for many elementary-aged students with ASD, public schools are still

working towards developing successful special education programs that implement effective inclusive strategies for all students (Locke et al., 2021).
ASD is a neurodevelopmental disorder characterized by a lack of social-emotional skills, including social communication, behavioral regulation, emotional expression, social interactions, self-repetitive behaviors, and limited interests (Altin et al., 2025; Kaler et al., 2024; Rolan et al., 2021). An effective implementation of inclusive education includes, but is not limited to, positive peer models, the usage of evidence based practices, and teacher self-efficacy (Paisley et al., 2022; Parsons et al., 2016). Although inclusion is an effective strategy for many elementary-aged students with ASD, public schools are still working towards developing successful special education programs that implement effective inclusive strategies for all students (Locke et al., 2021).

ASD is a neurodevelopmental disorder characterized by a lack of social-emotional skills, including social communication, behavioral regulation, emotional expression, social interactions, self-repetitive behaviors, and limited interests (Altin et al., 2025; APA, 2025; Gev et al., 2021). The diagnosis of ASD is increasing each year, with 1 in 31 children currently diagnosed with ASD in the United States (Altin et al., 2025; CDC, 2025). Children are most commonly diagnosed with ASD around 4 years old; however, signs of ASD may become apparent before the age of 1 (APA, 2025). Children with less severe traits of ASD, African American and Hispanic children, as well as children from a lower socioeconomic status, are likely to receive a diagnosis of ASD later than Caucasian children and children from higher socioeconomic status (APA, 2025).

Although the diagnoses of ASD are increasing, autistic characteristics in individuals became apparent in the 1800s and were linked to ASD starting in the 1900s (Silva & Lebrun, 2023). In 1911, Swiss psychiatrist Dr. Bleuler was the first to recognize the characteristics of ASD, and he classified ASD as a type of schizophrenia (Silva & Lebrun, 2023). The term ASD originated from the Greek term "autos," which means "self" (Ghazi, 2018, p 2). The term autism was created due to the characteristic of limited social interaction and keeping to oneself, which many individuals with ASD exhibit (Ghazi, 2018). In 1943, Dr. Kanner, also known as the "father of child psychiatry" and the "father of autism syndrome" coined the term ASD after recognizing similar traits in 11 of his child psychiatric patients at Johns Hopkins Hospital (Ghazi, 2018; Kanner,1943,.pg. 7). Kanner (1943) created a case study of his 11 patients at Johns Hopkins Hospital in which he tracked the children's development over time and identified key characteristics each child demonstrated. These characteristics, which are commonly associated with ASD, included a lack of social interaction, repetitive behaviors, and a reluctance to change (Kanner, 1943). ASD gained recognition by the American Psychological Association in the 1980s as a disorder separate from schizophrenia (Ghazi, 2018; Silva & Lebrun, 2023).

Autism is now recognized as a disorder in which the degree of func-

tioning varies between individuals who are diagnosed (APA, 2025). The DSM-5 identifies three levels of ASD, with Level 1 requiring some support, Level 2 requiring substantial support, and Level 3 requiring significant support (APA, 2020). The DSM-5 used to recognize Asperger's Syndrome as a type of Autism; however, it is no longer a medical diagnosis, as the needs of individuals with Autism are on a spectrum rather than specific categories (APA, 2013). What causes ASD remains unclear; however, Silva & Lebrum (2022) suggested that both genetic and environmental factors may contribute to the development of ASD.

The fundamental idea that all students should have access to an education, regardless of their differences, became prevalent during Brown v. The Board of Education of Topeka, 1954 (Hammel & Hourigan, 2024). Brown v. The Board of Education overturned the separate but equal doctrine previously established by Plessy V. Ferguson in 1896 to eliminate segregation in schools (Yell, 2021). Brown v. The Board of Education focused on ensuring African American students had equal access to education in the same spaces as their Caucasian peers. The elimination of segregation in schools set the precedent for inclusive education for all students, including students with disabilities, throughout the United States (Hammel & Hourigan, 2024). After approximately 20 years of advocacy for an equitable education following the Brown v. Board of Education, Public Law 94-142 was passed in 1975 and provided children with disabilities a free and appropriate public education (FAPE), in the same school as their typically developing peers (Hammel & Hourigan, 2024). Public Law 94- 142 is now known as the Individuals with Disabilities Improvement Act (IDEA), which was last amended in 2008 (Hammel & Hourigan, 2024; Wehmeyer et al., 2021). Along with ensuring a FAPE, IDEA ensures that students have access to the least restrictive environment (LRE), meaning that students with disabilities are taught in the same classrooms as their typically developing peers to the maximum extent possible, and have access to the resources they need to be successful in school (McCloskey, 2016). Students with disabilities such as ASD are entitled to an annual meeting for parents and professionals to collaborate in creating an Individualized Education Program (IEP) (McCloskey, 2016). The IEP will include the setting of instruction and the accommodations needed to support learning (McCloskey, 2016). The resources for students with ASD may include, but are not limited to, paraeducators, assistive technology, occupational therapy, and speech therapy, all essential to and included in their IEP (Hammel & Hourigan, 2024; Wehmeyer et al, 2021).

Throughout the United States, students with disabilities receive special education in a variety of settings (Ahlers et al., 2023). Students with mild to moderate disabilities or Level 1 and 2 ASD may spend most of their time and receive special education services in a general education classroom (Ahlers et al., 2023). Currently, 40% of children with ASD spend 80% or more of their day in a general education setting while receiving various special education

supports (Markham & Jones, 2024). Most children with severe disabilities or Level 3 ASD spend most of their day in a self-contained setting or a separate school specifically for children with moderate to severe disabilities (Ahlers et al., 2022). Self-contained settings usually have lower teacher-student ratios and include multiple grade levels of children with moderate to severe special needs (Ahlers et al., 2023). Education professionals, as well as parents of children with disabilities, may decide to place the student with a disability in a self-contained setting for lower teacher student ratios and individualized attention (Ahlers et al., 2023). However, self-contained classrooms include children across varying grade levels who all require additional attention and support from the teachers (Ahlers et al., 2023). Self-contained classrooms often do not provide students with special needs access to the general education curriculum; therefore, this limits their opportunity to interact wth their typically developing peers (Ahlers et al., 2023; Gev et al., 2021; Vygotsky, 1978).

Although many schools are now practicing inclusive education by integrating students with disabilities into the general education classrooms, many students with severe special needs are still being educated separately from their typically developing peers and in schools much further away than their local public schools (King-Sears et al., 2021; Hammel & Hourigan, 2024). The topic of inclusive education for students with moderate to severe special needs, such as children with Levels 2 and 3 ASD, has become controversial as some argue that the behaviors of students with severe needs may be distracting for typically developing peers and difficult for teachers to manage (Dukes & Berlingo, 2020).

Statement of the Problem

Elementary-aged students with ASD are more likely to perform below grade level in both reading and mathematics (Solari & Henry, 2022). Students with ASD may also lack developmentally appropriate social-emotional skills that affect their ability to participate in general education activities (Bullen et al., 2022). Many students with ASD face barriers in education, such as behaviors and various mental health disorders (Barna et al., 2024; Tereshko et al., 2024). Approximately 84% of children with ASD under the age of 18 also experience anxiety (Tereshko et al., 2024; Barna et al., 2024). Due to mental health and other traits commonly associated with ASD, up to 65% of students with ASD perform below grade level in reading, and up to 40% of students with ASD perform below grade level in mathematics (Bullen et al., 2022). Examining strategies to support students with ASD in developing social-emotional and academic skills may help students with ASD become more successful in inclusive learning environments.

The low academic performance of many students with ASD demonstrates a need for the development and implementation of effective inclusive teaching strategies (Bullen et al., 2022). General education teachers receive approximately 1.5 special education courses during their college preparation

programs, while special education teachers complete about 11 special education courses during their college preparation programs (Paisley et al., 2023). The lack of education in inclusive strategies for general education teachers is a concern as schools across the United States shift to an inclusive learning model (Paisley, 2023). Instructional strategies such as creating a sensory-friendly environment, providing social-emotional learning opportunities, co-teaching, and implementing visual and kinesthetic learning opportunities are all strategies that may support students with ASD (Barna et al., 2024; Tussey et al., 2022; Weiner & Greiner, 2020). Examining strategies to support elementary-aged students with ASD and providing general education teachers with training on the implementation of these strategies may be beneficial in helping students with ASD in an inclusive learning environment.

Inclusive education has demonstrated increased social-emotional development skills and academic achievement; however, many children with ASD continue to learn in self-contained settings and away from their typically developing peers (Ahlers et al., 2023; Johnson, 2024). Although research on inclusive strategies for students with ASD is available, the overwhelming number of students with ASD performing below grade level in both reading and mathematics demonstrates a need for more research on effective strategies and the implementation of these strategies in general education classrooms (Bullen et al., 2022; McClure et al., 2024). Although many children with mild to moderate ASD are now receiving most of their education in a general education setting, there needs to be more research on inclusive teaching strategies for children with moderate to severe ASD and the impact that inclusive education for students with moderate to severe disabilities has on all children.

Purpose of the Project

The purpose of this study is to examine how inclusive teaching strategies support elementary-aged students with ASD to develop social-emotional skills and meet grade level content standards in reading and mathematics (Rice et al., 2024; Hugh et al., 2024). In the United States, 1 in 31 children are diagnosed with ASD (Centers for Disease Control and Prevention [CDC], 2025), and approximately 40% of children with ASD spend 80% or more of their day in general education classrooms (Markham & Jones, 2024). Although elementary-aged students with ASD are spending more time in general education settings, students with ASD are still performing below grade level in mathematics and reading (Bullen et al., 2022; Solari et al., 2022).

General education teachers reported not receiving adequate training on inclusive and instructional strategies to support their students with ASD (Parsons et al, 2016). Special education teachers and general education teachers lack adequate instructional strategies to support their students with ASD in achieving academic success (Paisley, 2023; Parsons et al., 2016, Zagona et al., 2025). The following questions will guide this research and provide insight on how to support elementary-aged students with ASD:

What instructional strategies can support the social-emotional development of elementary-aged students with ASD?

What instructional strategies can enhance the academic environment of elementary-aged students with ASD learning to read?

What instructional strategies can enhance the academic environment of elementary-aged students with ASD learning math?

Theoretical Framework of the Project

Vygotsky's Theory of Cognitive Development is the foundation on which many effective strategies are built. Vygotsky (1978) believed that children acquire cognitive development through collaborative learning with a more knowledgeable other (MKO). In an educational setting, the MKO may be the teacher, an aide, a parent volunteer, or even another student. Practicing inclusive strategies by creating an environment where students with ASD interact with their peers provides a plethora of opportunities for students with ASD to participate in collaborative learning (Johnson, 2024). In addition to more opportunities for collaborative learning, having students with ASD learn in the same environment as their typically developing peers also provides an opportunity for informal interactions. Vygotsky believed that all children learn to interact with others through informal and formal interactions (McLeod, 2025). An example of an informal interaction between elementary-aged children is play (McLeod, 2025). Vygotsky (1978) emphasized the importance of young children participating in make-believe play to support their cognitive development (McLeod, 2025). Many children with ASD struggle with developing social-emotional skills; therefore, they may struggle with engaging in make-believe play (Tussey et al., 2022; Barna et al., 2024; Bolourian et al., 2022; Henry & Solari, 2022). Activating prior knowledge by using social stories and connecting social learning to prior knowledge may support children with ASD in comprehending new information and participating in play with peers (Henry & Solari, 2022). Participating in make-believe play also supports social-emotional development, specifically self regulation skills (Tereshko et al., 2024). Many students with ASD struggle with using self-regulation skills in the classroom (Tereshko et al., 2024). Due to the importance of dramatic play in supporting cognitive and social-emotional development, educators of young students with ASD can enhance the dramatic play environment by providing structure and direct instruction on social situations (Henry & Solari, 2022).

Vygotsky (1978) identified both informal interactions and formal instructions as crucial ways for children to acquire cognitive development. Formal instruction occurs when the teacher directly teaches students through scaffolding and utilizing the zone of proximal development (McLeod, 2025). Vygotsky (1978) identified the zone of proximal development as the bridge between what children can do on their own, and what they can achieve with assistance from the MKO (McLeod, 2025). Teachers can use assessments to identify students' zone of proximal development and scaffolding to help stu-

dents connect actual and potential learning (McLeod, 2025). Inclusive strategies for students with ASD are beneficial as they allow students to participate in collaborative learning with diverse peers and provide an opportunity for students to receive formal instruction in a safe learning environment (McLeod, 2025; Minuk et al., 2024).

Reciprocal teaching is another instructional strategy that Vygotsky identified in the Theory of Cognitive Development (McLeod, 2025). Reciprocal teaching occurs when teachers and students engage in a two-way discussion on a specific topic (McLeod, 2025). Over time, students will take over the discussion and begin to teach one another (McLeod, 2025). When students with disabilities are included in general education settings, they have the opportunity to engage in reciprocal teaching to benefit their social emotional growth and academic success.

The learning environment of students is another important factor in Vygotsky's Theory of Cognitive Development (1978). Vygotsky believed that the environment in which children grow up is the main source of cognitive development influence (McLeod, 2025). Creating an environment where students have opportunities to internalize knowledge is critical, according to Vygotsky's Theory of Cognitive Development (McLeod, 2025). Children internalize knowledge by using information learned in social interactions to develop their inner speech (McLeod, 2025). Vygotsky (1978) identified three different types of speech (McLeod, 2025). Social speech develops first at approximately age 2 and occurs when children begin speaking with others in their environment (Vygotsky, 1978). Next, private speech develops and occurs when children talk to themselves through problem-solving. Lastly, inner speech develops around age 7 and occurs when individuals problem-solve using covert inner dialogue (Vygotsky, 1978). Vygotsky (1978) believed that the development of speech is greatly impacted by a child's environment (McLeod, 2025). Vygotsky (1989) believed that cultivating a linguistically rich environment where students can interact with peers can support social growth and communication skills (McLeod, 2025; Weiner & Griener, 2020).

Definition of Key Terms

The following key terms and definitions are essential to the purpose of this research paper.

Academic Success: Academic success refers to a student's ability to meet educational goals in reading, mathematics, and social and emotional skills set by educators and professionals (Dalgaard et al., 2022).

Autism Spectrum Disorder(ASD): ASD is a neurodevelopmental disorder characterized by a deficit in social communication and interactions, self-repetitive behaviors, and limited interests (Altin et al., 2025).

Co-Teaching: Co-teaching occurs when special education teachers collaborate with general education teachers to teach students with and without disabilities in the same classroom (King-Sears et al., 2021).

Content Standards: Content standards are developmentally appropriate knowledge and skills that students should aquire to demonstrate competency in grade-level criteria (Dalgaard et al., 2022).

Elementary-Aged Students: Elementary-aged students are between the ages of 5 to 10 years old (USA Hello, 2022).

Evidence-Based Practice: Evidence-based practices are skills, techniques, and strategies that have been thoroughly studied via experimental research (Cook, 2025).

Free and Appropriate Public Education (FAPE): FAPE ensures children with disabilities have access to a free and appropriate public education and receive education in the least restrictive environment (Hammel & Hourigan, 2024).

General Education: General education is a program available to all students, and it offers content knowledge and skills necessary for students to apply to and be competent in everyday life. In generation education, students receive grade-level instruction with same-aged peers and a credentialed teacher (Fuchs et al., 2025).

Inclusive Education: Inclusive Education is a policy that guarantees equitable and quality education to all students (Trani et al., 2024).

Individualized Education Program (IEP): An IEP is a written statement that serves as a legal document and outlines the specific support services needed by a student with a disability to ensure FAPE (Department of Education, 2000).

Individuals with Disabilities Education Act (IDEA): IDEA is a federal law that guarantees FAPE for all students with disabilities (Hammel & Hourigan, 2024). Instructional Strategy: Instructional strategy is a method that educators use to engage students, facilitate learning, and enhance the educational process (Persaud, 2024). Least Restrictive Environment (LRE): The LRE provides students with disabilities a safe space to learn amongst their typically developing peers to the maximum extent possible (Rozalksi, 2011).

Special Education: In special education, instruction is designed to meet the needs of students with disabilities (Fuchs et al., 2025).

Summary

Inclusive teaching strategies and their impact on the academic success of students with ASD and their peers continue to be an important topic of conversation within education. There are many positive learning outcomes for both students with disabilities and their typically developing peers when they learn in the same environment (Roldan et al., 2021). Students with ASD show increased performance in academic and social emotional development in an inclusive learning environment (Johnson, 2024). Typically developing children also show an increase in academic performance as well as a positive attitude towards diversity when learning alongside children with disabilities (Roldan et al., 2021).

Chapter 2 is a literature review that explores the impact of inclusive teaching strategies on the social-emotional development and academic success of elementary-aged students with ASD. Teachers across America struggle to find strategies to support the increasing number of students with ASD in their classes (Paisley et al., 2023). Teachers also face difficulty in managing the behaviors of students with ASD (Ahlers et al., 2023; Paisley et al., 2023). Chapter 2 examines best practices such as behavioral regulation to support students with ASD in developing social-emotional skills. Chapter 2 also analyzes teaching strategies to support students with ASD reach mastery of grade-level content standards.

Chapter 2: Review of Related Literature
Introduction

Students with autism spectrum disorder (ASD) often lack social-emotional development skills and perform below grade level in both reading and mathematics (Bullen et al., 2022; Henry & Solari, 2022). Approximately 65% of elementary-aged children with ASD are behind grade level in reading, and approximately 40% of students with ASD perform below grade level in mathematics (Bullen et al., 2022). Children with ASD are in the top four largest categories of disabilities served under the Individuals with Disabilities Education Act (Bullen et al., 2022). The number of children diagnosed with ASD is increasing yearly with 1 in 31 children diagnosed with ASD in the United States (CDC, 2025). Schools across the United States are transitioning from self-contained learning models to inclusive learning models to meet the growing student population with ASD. The current statistics show that approximately 91% of students with ASD attend general education schools and approximately 40% of students with ASD spend 80% or more of their day in general education (Bolourian et al., 2021; Markham & Jones, 2024). The growing prevalence of children with ASD in general education presents a need to explore strategies to support children with ASD in reaching social and academic goals.

Although inclusive learning is transitioning to the classroom setting, general education teachers reported feeling underprepared to support their students with special needs, when compared to special education teachers, due to a lack of training (Hugh et al., 2021; Paisley et al., 2023). A study on the disparity between special education teachers and general education teachers revealed that special education teachers completed approximately 11 college courses on special education while general education teachers only completed approximately 1.5 courses on special education (Paisley et al., 2023). With the transition to inclusive education, general education teachers need adequate training on teaching strategies to support all their students.

Social-emotional development is an area in which many elementary-aged children with ASD struggle and require support. Because a certain level of social-emotional maturity is necessary to retain content knowledge, scholarly

works tend to focus on addressing behaviors through improving social interactions and emotional development. When students reach a certain stage of social-emotional development, they are more likely to succeed academically (Braun & Tejero Hughes, 2020). However, this leads to a lack of specific strategies available to support students with ASD in reaching content standard mastery in areas such as reading and mathematics (Braun & Tejero Hughes, 2020).

This literature review will begin with a discussion on social-emotional development that includes the development of skills such as emotional regulation, emotional expression, and the identification of emotions in oneself and others (Gev et al., 2021). This literature review will also explore the components of a successful inclusive learning environment. With more students with ASD learning in a general education setting, understanding strategies that general education teachers can use may benefit students with ASD. Finally, this literature review examines specific strategies to support students with ASD in reading and mathematics.

Social-Emotional Development

Social-emotional development is the development of skills necessary to understand one's own emotions, identify the emotions of others, express emotions, and understand and utilize emotional regulation strategies (Gev et al., 2021). Research identified a link between social-emotional competency and academic success (Denham et al, 2015, as cited in Gev et al., 2021). According to Vygotsky's Theory of Cognitive Development, children develop social-emotional skills through formal or informal interactions with peers, and these positive interactions enhance academic experience (Vygotsky, 1978). Vygotsky's Theory of Cognitive Development is the foundation for multiple research studies on peer interaction and social-emotional development, and this framework supports reasons why inclusion is beneficial for many students with ASD (Gev et al., 2021; Guasach 2025; Vygotsky, 1978).

Typically Developing Elementary-Aged Students

Social-emotional development is an important part of education for elementary aged students. Social-emotional learning curriculum typically begins in preschool and continues throughout a child's education. Curby (2015) found a direct link between social-emotional competency and academic success in elementary-aged students. Curby (2015) studied 91 preschool children attending a Head Start program and found that children who exhibited social-emotional expression and regulation abilities scored higher on preliteracy performance. Therefore, the link between social-emotional maturity and academic success highlights the significance of social-emotional instruction. General education classrooms provide students with opportunities to interact with peers and build on their social-emotional skills. Engaging in dramatic play, participating in recess and discussions, and working together in small and large groups are all opportunities for children to engage in informal interactions.

Vygotsky believed that children learn most through social interactions and least in isolation (1978). Learning in a general education classroom, engaging in social-emotional curriculum, and participating in daily activities with peers can enhance the environment of elementary-aged children and contribute to their academic success (Curby et al., 2015; Vygotsky, 1978).

Elementary-Aged Students with ASD

Elementary-aged students with ASD typically present a deficit in social-emotional development (Gev et al., 2025; Guasch et al., 2024). Many teachers reported that their students with ASD are socially isolated from their peers (Able et al., 2015). Gev et al. (2025) determined that children with ASD lack emotional expression and regulation skills. Gev et al. (2025) evaluated the social-emotional development of autistic children compared to typically developing children while playing age-appropriate games. They found that children with ASD performed below their typically developing peers in all areas of social-emotional development, and emotional expression and regulation are areas of significant need.

Figure 1

[Comparison of Social-Emotional Skills in Children With and Without ASD]
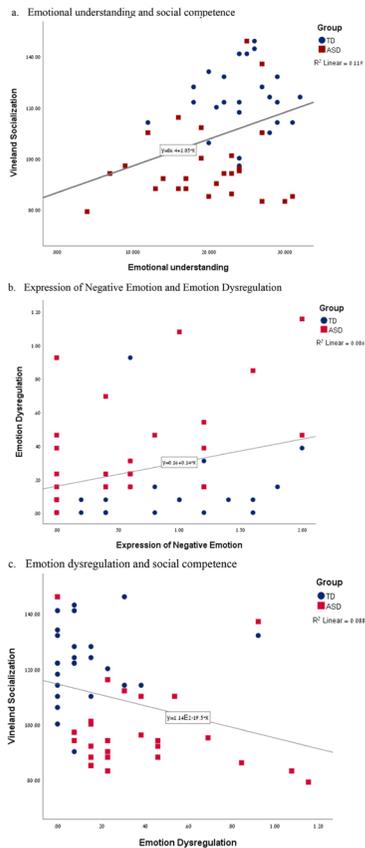
Although elementary-aged students with ASD struggle with social-emotional developmental delays, their delays do not always significantly affect their ability to participate in activities with their typically developing peers. Guasach et al (2024) conducted a study to determine the effectiveness of inclusive practices for the social emotional development of elementary-aged children with ASD. This study, done in Spain, had children with ASD with impaired social skills as research participants. Guasach et al (2024) analyzed 20 students with ASD as they integrated into general education classes and received instruction in self-contained classrooms. They found that students with ASD integrated into general education classrooms had more difficulty maintaining a content state of emotion than their peers, but their emotions did not significantly impact their ability to participate. However, these students with ASD rarely initiated interactions with peers but would continue the interaction once initiated by a typically developing peer (Guasach et al., 2024).

Teachers can model how to initiate interactions to facilitate the relationship between students with ASD and typically developing students. In the study conducted by Guasach et al. (2024), both the self-contained classrooms and the general education classrooms had strategies that supported students with ASD. These strategies included groupings, visual aids, nonverbal and verbal communication, defining of goals, transitions, modeling, and routines. However, the special education classroom utilized strategies to support learning more than the general education classrooms, and the general education classrooms provided more opportunities for students to interact with their typically developing peers.

Although inclusive education is beneficial for the social-emotional development of students with ASD, many teachers have expressed concerns for managing behaviors and facilitating relationships with their students with ASD (Able et al., 2015). Teachers across all grade levels reported that students with ASD in their classroom lacked skills such as social relationships, self-advocacy, and peer relationships. Teachers also had difficulties balancing social and academic supports for their students with ASD (Able et al., 2015). The task of supporting the social-emotional development of children with ASD can be very difficult for many educators, which is a common reason why children with ASD are not attending the general education classrooms (Able et al., 2015; Gev et al., 2021).

Academic Success

Academic success may look different for students with ASD in comparison to their typically developing peers. Typically developing children reach

academic success through mastering grade-level Common Core content standards. Although some children with ASD may be able to meet grade-level content standards, most children with ASD perform below grade-level in reading and mathematics (Bullen et al., 2023). Individual Education Programs (IEPs) are created by administrators, teachers, guardians of the child with ASD, and other specialized professionals to form realistic academic goals and outline support necessary to help the child achieve their goals (McCloskey, 2016). Examining inclusive teaching strategies can support teachers in building an inclusive classroom that fosters positive learning experiences for students.

Typically Developing Elementary-Aged Students

There are multiple ways teachers measure the academic success of elementary aged students. Measurements of success may include grades, growth models, and percentile growth (Dalgaard, 2022). The most common assessment of academic success of elementary-aged students is meeting grade-level Common Core State Standards. Throughout the school year, typically developing students work on furthering their academic skills and meeting different learning objectives. While academic success for typically developing students is commonly measured by grades, it may look different for students with special needs.

Elementary-Aged Students with ASD

IEPs support students with special needs and help them reach their personalized academic and social goals. The contents of an IEP include current performance, annual goals, special education services, participation with typically developing peers, and measurements of progress (U.S. Department of Education,2000). IEPs are specifically tailored to each student and states the amount of time each student spends in general education (McCloskey, 2016). More students with an IEP, including students with ASD, are spending more time in inclusive learning environments such as the general education classroom (Solari et al., 2022). Inclusive education provides students with special needs and IEPs an opportunity to interact with same-aged peers. Vygotsky (1978) believed that children learn through social interactions with a more knowledgeable other (MKO). Providing students with ASD the opportunity to interact with typically developing peers may improve their relationships with people, enhance their emotional well-being, and promote academic success. Transitioning from self-contained to inclusive learning environments requires a greater understanding of how to create an inclusive learning environment while utilizing instructional strategies.

Inclusive Strategies to Foster Social-Emotional and Academic Development

Many children with ASD are socially isolated and need support to be socially and emotionally healthy (Able et al., 2015). They are also significantly behind grade level in mathematics and reading (Bullen et al., 2022). With the increasing amount of children with ASD in general education classrooms, general education teachers need strategies to support their students with ASD.

Informal and Formal Social Interactions

Understanding Vygotsky's Theory of Cognitive Development may guide teachers in balancing social and academic support for students with ASD. Vygotsky's Theory of Cognitive Development (1978) emphasized the importance of informal and formal social interaction. Informal interactions occur when students share knowledge through language by interacting with each other (McLeod, 2025; Vygotsky, 1978). With strategies that are built upon Vygotsky's theory, teachers can help their students engage in informal interactions daily through conversations with peers, collaborative activities, and make believe play. Vygotsky highlighted the importance of make-believe play as an essential form of informal interaction for elementary-aged children (McLeod, 2025; Vygotsky, 1978). However, children with ASD often find make-believe play a difficult task (Westby, 2022). Ensuring the play materials are developmentally appropriate and intriguing to the children can stimulate their interest in make-believe play (Westby, 2022). In addition to informal interactions, Vygotsky (1978) highlighted formal instruction as another essential form of learning for elementary-aged children. Formal interactions occur each day when students participate in planned lessons with an MKO (McLeod, 2025; Vygotsky, 1978). Inclusive education provides students with opportunities to participate in daily and frequent informal and formal interactions in order to nurture teacher-student and peer-to-peer relationships.

Both teacher and peer relationships are important for inclusive education and crucial to fostering successful inclusion. Bolourian et al. (2021) found that developing positive teacher-student relationships can contribute to both social-emotional development and academic success. Teachers can build relationships with students by avoiding biases, showing curiosity in the interests of their students, finding one-on-one time for conversations, and providing positive feedback (Bolourian et al., 2021).

In addition to building strong teacher-student relationships, facilitating peer relationships is another important role a teacher plays in an inclusive learning environment. Modeling positive interactions with students with ASD is one way to support relationships amongst typically developing peers and students with ASD. Engaging the class in compliment circles and showcasing talents or interests for students to find commonalities are all approaches to building peer-to-peer relationships (Bolourian et al., 2021).

Facilitating peer relationships contributes to a positive learning community. Allowing children to participate in special classroom responsibilities can also contribute to a positive environment where children feel valued. When teachers create a classroom where students feel they are heard, valued, and seen, they have a successful, inclusive learning environment (Bolourian et al., 2021). Enhancing classroom structure and activities can increase formal and informal interactions. Strategies to boost the classroom structure and activities are: social stories, routines, and calming areas. Social Stories

Social stories are an inclusive learning strategy that may benefit stu-

dents with ASD in a general education setting. Social stories are becoming a commonly used intervention for children with ASD and can be customized to support students in specific areas of need (Barna et al., 2024). An example of applying social stories in an inclusive learning environment is using personalized photos and text to explain what a child can expect on the first day of school in order to alleviate their anxiety level (Barna et al., 2024). Using social stories to activate prior knowledge may help ease the anxiety of students with ASD, which is a very common feeling that children with ASD experience, with approximately 84% of children under 18 with ASD experiencing anxiety (Barna et al., 2024). This is a strategy that can bolster formal social interactions between teachers and students.

Routines

Establishing routines in an elementary classroom is another strategy to support social interactions, and it is also beneficial to students with ASD. Many children with ASD thrive on predictability and consistency (Bolourian et al., 2021). Therefore, setting daily routines provides predictability and consistency for all children; in return, students can focus on building relationships with their peers and teachers. In addition to predictability, routines can minimize inappropriate behavior and anxiety that many students with ASD may experience at school (Barna et al., 2024: Bolourian et al., 2021). Establishing routines minimizes chaos and maximizes opportunities for social interactions.

Calming Areas

Creating calming areas in the classroom is another inclusive strategy that may benefit students with ASD. Creating a calming space in the classroom can reduce anxiety and support social-emotional development skills, such as emotional regulation with which many students with ASD struggle (Barna et al., 2021; Gev et al., 2025). The appropriate materials are dependent on the needs of each student and include stress balls, pop-its, pillows, blankets, noise-canceling headphones, and silly putty (Barna et al., 2021). Calming areas may be essential to an effective inclusive classroom environment.

Strategies Across Curriculum

In addition to creating an inclusive learning environment, teachers also need to implement instructional strategies to meet the needs of their diverse learners. Evidence-based practices or instructional strategies to support the needs of students with ASD include activating prior knowledge, utilizing technology, peer-tutoring, modeling, and differentiating learning (Barna et al., 2024; Rice et al., 2024; Solari et al., 2022). Getting to know students may guide teachers in selecting the most appropriate strategies for their students.

Activating prior knowledge is one instructional strategy that can benefit students with ASD when they are learning new content (Cervetti & Hiebert, 2018; Solari et al., 2022). Guiding students to connect activities to personal experiences may support their comprehension of the new material (Cervetti & Hiebert, 2018). Since many children with ASD present social deficits, activating prior knowledge and explicitly teaching social knowledge may

support students with ASD in understanding new concepts (Bolourian et al., 2021; Cervetti & Hiebert, 2018; Solari et al., 2022). Activating prior knowledge is a strategy that teachers can utilize across the curriculum to best support students in retaining new information.

Another instructional strategy that benefits students is technology-aided instruction. Kerrigan et al. (2021) found that offering multiple means of expression through a universal learning design supports students with ASD to meet academic goals. One example of a universal design for learning includes allowing all students to use text to-speech software to complete an assignment (Kerrigan et al., 2021). Educators can implement this software in their classroom so that their students can complete assignments and demonstrate their retention of new information.

Peer tutoring is another instructional strategy to support students with ASD (Kerrigan et al., 2021; Minuk et al., 2024). When students engage in peer tutoring, one student acts as the MKO and supports the learning of the other student (Vygotsky, 1978). Peer tutoring and mediation may improve social skills, communication skills, and academic skills of students with ASD (Kerrigan et al., 2021). Inclusive education provides ample opportunities for students to engage in peer tutoring.

Modeling also promotes a positive learning experience in the classroom (Kerrigan et al., 2021). Peer modeling is a foundational idea associated with inclusive education, which provides an environment where students with ASD can learn from their typically developing peers (Locke et al., 2021). Modeling occurs when the MKO demonstrates the desired behavior or activity and results in imitation by the learner (Locke et al., 2021; Vygotsky, 1978). Teachers can utilize peer models in an inclusive environment.

Differentiated Instruction is a modern teaching strategy that supports the individual needs of diverse students (Zafiri et al., 2019). Zafiri et al. (2019) conducted a case study that showed the effectiveness of Differentiated Instruction on the academic success of a 4-year-old boy with ASD (Zafiri et al., 2019). The study concluded that Differentiated Instruction yielded positive results in both reading and writing skills (Zafiri et al., 2019). Derived from Vygotsky's theory and notion of zone of proximal development, Differentiated Instruction encourages teachers to connect with individual students to determine the most effective instructional strategies for them (Vygotsky, 1978; Zafiri et al., 2019). Differentiating instruction is an essential concept of teaching across the curriculum (Zafiri et al., 2019).

Strategies in Learning Mathematics

Despite the movement towards inclusive education, approximately 40% of elementary-aged students with ASD perform below grade level in mathematics (Bullen et al., 2022). With more students with ASD attending general education, many general education teachers reported difficulties in knowing how to support their students to meet mathematics standards; furthermore, there is limited research on strategies specifically for mathematics

learning (Sabaruddin et al., 2020). This is largely because learning math, foremost, requires a certain level of social and emotional maturity, and students also need basic literacy skills; therefore, the integration of reading with math strategies is necessary to support mathematical learning (Bassette et al., 2019; Bouck et al., 2013).

The usage of manipulatives is an instructional strategy that supports students with ASD in reaching their mathematics learning goals. Bassete et al. (2019 and Bouck et al. (2013) conducted two case studies. The first case study examined the effectiveness of both concrete and technological manipulatives on learning mathematical skills. Using elementary-aged students with ASD, this case study showed positive results, which suggested that the usage of both concrete and technological manipulatives may be a beneficial intervention strategy to support elementary-aged students with ASD in learning mathematics (Bassette et al., 2019; Bouck et al., 2013).

The first case study focused on the ability of elementary-aged students with ASD to perform subtraction problems while using manipulatives as an intervention. After students received explicit instruction on how to use both concrete and technological manipulatives, each student's subtraction skills significantly increased. Figure 1 shows improvement in the mathematical concepts of subtraction from a male student by using concrete and technological manipulatives:

Figure 2
Impact of Intervention on Problem-Solving Skills
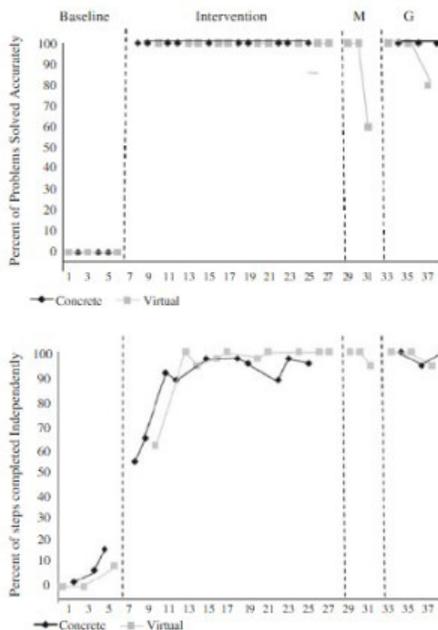
Note. This graph demonstrates the relationship between the percentage of problems solved accurately with and without intervention. From "Virtual and concrete manipulatives: A comparison of approaches for solving mathematics problems for students with autism spectrum disorder," By E. Bouk, R. Satsangi, T. Doughty, and W.T. Courtney, 2014, *Journal of Autism and Developmental Disorders, 44,* p. 180- 193https://doi.org/10.1007/ s10803-013-1863-2). Copyright 2014.

  The second case study also focused on understanding the effectiveness of the manipulative usage on the mathematical skills of elementary-aged students with ASD, but by using both concrete and technology manipulatives to support learning. This case study also yielded positive results (Bassette et al., 2019). It concluded that both concrete and technological manipulatives supported these students in learning new mathematics concepts; however, different students preferred different manipulatives (Bassette et al., 2019). Introducing multiple strategies and getting to know what works for each student may be necessary when working towards mathematical achievement (Bassette et al., 2019).

  In addition to utilizing manipulatives, explicitly teaching mathematical language may be beneficial for elementary-aged students with ASD, specifically in upper elementary grades when the curriculum becomes more advanced (Cox & Hughes, 2024). Understanding figurative language is a skill that is often difficult for many individuals with ASD (Henry & Solari, 2022). Floyd (2020) found that homonyms, which are very common in mathematics, are particularly difficult for students with ASD to understand. A homonym occurs when two or more words have the same spelling or pronunciation but have different meanings (Cox & Hughes, 2024). Explicit instruction of mathematical language includes modeling the mathematical language, using graphic organizers, and demonstrating knowledge of mathematical language. These are all strategies that may be beneficial in supporting students with ASD to develop an understanding of mathematical language (Cox & Hughes, 2024).

  To best support students with ASD reach academic success, Bullen (2022) conducted a study to determine how different variables, such as IQ scores, time spent in general education, age, working memory, and symptoms, affect mathematics and reading achievement. Bullen (2022) found that students with ASD who spent at least 80% of their day in general education perform higher in academics than students with ASD who spent less than 80% of their day in general education. However, Bullen (2022) also found that students with ASD have different strengths and areas of cognitive and emotional needs; therefore, screening to identify specific strengths and areas of need for students with ASD may be beneficial in determining strategies and placements.

Strategies in Learning to Read

  One main goal of elementary education is teaching children how to read. Although teaching reading skills is an essential part of elementary educa-

tion, only 5% of general education teachers feel confident in their abilities to teach reading to students with ASD (Braun & Hughes, 2020). Approximately 65% of elementary-aged students with ASD perform below grade level in reading, and this creates a challenge for general education teachers (Bullen et al., 2022). Reading strategies are crucial in helping students with ASD improve their reading skills (Bullen et al., 2022).

Reading comprehension is the main reading skill that many students with ASD struggle to achieve (Bednarz H et al., 2017; Henbest et al., 2024; Solari, 2022). For children to acquire reading comprehension skills, they must first demonstrate adequate decoding and linguistic comprehension skills. Solari (2020) designed an empirical study to determine whether reading intervention strategies support elementary-aged students with ASD. Solari (2020) conducted a randomized controlled trial of 43 elementary-aged students with ASD and found a significant correlation between intervention activities and listening comprehension and language skills (Solari, 2020). These intervention activities from Solari and Ciancio's (2024) intervention program were read-alouds, vocabulary instruction, and written expression. Although findings of this study were conclusive, Solari (2020) recognized a need for more research on specific strategies to support the reading development of children with ASD.

There are activities, in addition to activities from Solari and Ciancio's (2024) intervention program, that could strengthen the reading skills of students with ASD. Graphic organizers are also a strong instructional strategy to support reading and particularly reading comprehension skills (Bethune & Wood, 2013). Bethune and Wood (2013) found in their study that graphic organizers provide visual representations of information contained in a text and can help students with ASD clarify the meaning of and identify key details in text. General education teachers can use graphic organizers to support elementary-aged students with ASD in developing vocabulary and reading comprehension skills.

The purpose of examining teaching strategies for students with ASD is to support students with ASD in both social-emotional development and academic success. Examining these strategies may provide fresh insight to general education teachers who need instructional methods to assist their students with ASD. While a wealth of scholarly works are available on the social-emotional development of students with ASD, future research could benefit from specific strategies to support students with ASD in their academic success.

Summary

The diagnoses of children with ASD continue to increase with 1 in 31 children currently diagnosed with ASD in the United States (CDC, 2025). Although many schools across the United States are transitioning to an inclusive learning environment, general education teachers are not prepared to support these students (Hui-Ting Wang et al., 2024; Markham & Jones, 2024; Paisley

et al., 2023; Solari et al., 2022). This project examined inclusive strategies that teachers can implement in their classrooms to support students with ASD.

Strategies to support the social-emotional development of students with ASD include informal and formal social interactions by utilizing social stories, routines, and calming areas to promote a structured classroom, increase positive interactions, and enhance the quality of social engagement (Barna et al., 2024; Bolourian et al., 2021; Gev et al., 2025). An effective method to support mathematics skills is Differentiated Instruction. Manipulatives and explicit instruction of mathematical language are all strategy examples of Differentiated Instruction that allow students with ASD the opportunity to work on specific skill development in a classroom with lower teacher student ratios (Bassette et al., 2019; Bouck et al., 2013; Cox & Hughes, 2024; Zafiri et al., 2019).

Teachers can also implement multiple strategies from Differentiated Instruction to fit the various needs of their students. Students with ASD may benefit from using manipulatives to have a physical or virtual representation of numerals while learning new skills (Bassette et al., 2021; Bouck et al., 2013). The manipulatives support student engagement with the new skill. Explicitly teaching mathematical language to students with ASD also supports them in understanding new concepts. Strategies to support reading skills include graphic organizers, read-alouds, and vocabulary instruction (Solari, 2020). Graphic organizers provide a visual representation of knowledge and can support the reading comprehension skills of students with ASD. Participating in read-alouds may help them stay engaged with the content and connect new to prior knowledge, while vocabulary instruction supports the clarity of text (Solari et al., 2020). Many students with ASD struggle to understand figures of speech, so focusing on vocabulary instruction may assist students in understanding new material (Cox & Hughes, 2024).

Although these strategies could improve the quality of education, children with ASD do not learn the same way and may have preferred learning strategies (Bassette et al., 2019). A research gap still exists in current research. Is there a difference in support needs for boys and girls with ASD? Would integrating students with Level 3 ASD have the same positive outcomes as integrating students with Level 1 and Level 2 ASD? The next chapter will present the findings of this project and recommendations for future studies.

Chapter 3: Implications
Introduction

Schools across America are transitioning to an inclusive learning model while diagnoses of Autism Spectrum Disorder (ASD) continue to increase (CDC, 2025; Markham & Jones, 2024). Elementary-aged students with ASD are more likely to perform below grade level in both reading and mathematics while also demonstrating a lack of social-emotional development skills in comparison to typically developing peers (Bullen et al., 2022; Gev et al.,

2021). General education teachers in the United States have reported feeling unprepared to support the social-emotional and academic needs of students with ASD (Paisley et al., 2023). This study sought to examine how inclusive teaching strategies assist elementary-aged students with ASD in developing social emotional skills and meeting grade-level math and reading standards. The goal of this study was to understand how to improve support for the social-emotional development and academic success of students with ASD.

Chapter 2 examined different inclusive strategies to help students with ASD in their social-emotional development and academic success. Chapter 2 demonstrated a need for more research on inclusive education for students with Level 3 ASD or severe disabilities. Chapter 3 includes insights from the literature review, discusses practice and policy implications, and provides recommendations for future studies.

Conclusions

This project highlighted the importance of inclusion in supporting both the social emotional and academic success of elementary-aged students with ASD. Social advantages of inclusion for elementary-aged students with ASD include improvements in emotional expression, emotional regulation, and communication (Minuk et al., 2024). In addition to social-emotional development, inclusion also benefits students academically (Minuk et al., 2024). Inclusive education, supported by Vygotsky's Theory of Cognitive Development, provides students with ASD opportunities to interact with typically developing peers. Vygotsky (1978) believed that students learn through social interactions with a More Knowledgeable Other (MKO). Through social interactions with MKO, students with ASD practice their acquired skills and deepen their new knowledge. Inclusive education provides students with ASD the opportunity to build friendships, learn from their peers, and improve their knowledge and skills.

Inclusive education not only benefits students with special needs but also typically developing students (Roldan et al., 2021). The common belief was that the behaviors of students with ASD would negatively impact the learning of typically developing children (Ahlers et al., 2021). However, Roldan et al. (2021) found that inclusive education improves social-emotional and academic learning outcomes for both children with ASD and typically developing children.

Extensive research on teaching strategies is available to support the social emotional development of children with ASD (Barna et al., 2024; Bolourian et al., 2021; Gev et al., 2025). These strategies are built upon Vygotsky's Theory of Cognitive Development and emphasize formal and informal interaction through play and daily routines. They focus on forming strong teacher-student relationships and fostering student-student relationships (Barna et al., 2024; Bolourian et al., 2021; Gev et al., 2025). Strategies include establishing a calming area in the classroom and implementing social stories as a

supplement to the curriculum (Barna et al., 2024; Bolourian et al., 2021; Gev et al., 2025).

In addition to strategies to support the social-emotional development of elementary-aged students with ASD, this project also explored strategies to support learning math and reading. Learning math requires the integration of literacy. The use of explicit vocabulary instruction and the use of concrete and technological manipulatives may be beneficial in supporting students with ASD in learning math (Bassette et al., 2019; Bouck et al., 2013).

Students need to have adequate coding and linguistic comprehension skills when learning to read (Solari et al., 2020). Strategies must first focus on helping students activate their prior knowledge, followed by repetition, so that students can build on new knowledge and strengthen their understanding. Graphic organizers and social stories are teaching strategies to activate prior knowledge. Additional reading comprehension practices should follow so that students retain and improve literacy skills (Bednarz H et al., 2017; Bethune & Wood, 2013; Henbest et al., 2024; Solari, 2022). Although children with ASD often share similar characteristics and need support in similar areas, teachers need to build relationships with each of their students and use their professional expertise to determine the best strategies for supporting their students.

Practice Implications

Implementing inclusive education in schools across the United States changes the way both the schools and classrooms operate from a traditional model of a teacher centered classroom to a student-centered classroom. Research continues to show positive impacts of inclusive education and effective teaching strategies; therefore, it is important   for schools to update practices to meet the needs of diverse learners (Ahlers et al., 2021; McCloskey, 2016; Roldan et al., 2021; Zagona et al., 2021). Although inclusive education promotes positive growth in social-emotional and academic development, if teachers do not receive adequate training on teaching children with special needs, the results may, instead, harm student learning (Locke et al., 2022). General education teachers do not currently receive enough training on teaching strategies to support the needs of students with ASD (Paisley et al., 2023). Providing more training on best practices to general education teachers is essential for the success of inclusive education.

With the increasing number of ASD diagnoses across the United States, teachers are having at least one student with ASD in their class each year, and this number is   climbing (CDC, 2025; Markham & Jones, 2025). This requires immediate attention to support student learning. Schools can provide professional development opportunities for teachers by bringing in behaviorists, therapists, and special education teachers to present best practices to support students in learning social-emotional, mathematical, and reading skills. Schools should bring in these professionals at the beginning of the year to support teachers in setting up their classrooms for all children, including

children with ASD. The professionals can support teachers in establishing routines and creating a calming environment with sensory-rich tools that children can use to regulate their emotions (Barna et al., 2021; Gev et al., 2021).

In addition to offering training before the school year begins, special education teachers, behaviorists, and therapists can provide quarterly presentations to update best practice strategies. Behaviorists and special education teachers can also work collaboratively and monthly with all general education teachers who have at least one student diagnosed with ASD in their classroom. Monthly meetings to support students with ASD will ensure that teachers use the most effective strategies to support individual needs. The most common concern for the inclusion of students with ASD in the general education classroom is whether or not their behaviors affect their learning experience as well as the experience of the typically developing children in the same classroom (Ahlers et al., 2021). Providing monthly support opens opportunities for sharing strategies with general education teachers on managing behavioral concerns.

Policy Implications

Universities in the United States should implement more special education courses for college students seeking a credential to teach elementary-aged children. On average, general education teachers complete 1.5 college preparation courses on special education, while special education teachers complete 11 college preparation courses on special education (Paisley et al., 2023). In California, educators are not required to major in an education-related field before beginning a credential program (CTC, 2025). Because of the varying backgrounds educators have before beginning a credential program, college students have different levels of knowledge on special education practices. Adding additional special education courses that teach inclusive strategies for students with special educational needs, such as ASD, to credential programs may be beneficial in preparing educators to support the needs of diverse learners.

In addition to creating policy changes within the college preparation for general education teachers, the allocation of funding at the federal, state, and local levels should also reflect the needs of elementary-aged students with ASD. Special education funding is currently based on AB 602, and schools receive a portion of the state and federal funding according to student attendance (Legislative Analyst's Office, 2021). In addition to AB 602, Free and Appropriate Public Education (FAPE) and the Individuals with Disabilities Education Act (IDEA) ensure that students with disabilities are in the Least Restrictive Environment (LRE) to the "maximum extent appropriate" (McCloskey, 2016, p. 1204). When professionals and parents of children with special educational needs gather during an annual Individual Education Program (IEP) meeting and decide the placement of the child, schools are obligated to place the child in the LRE, which is typically the general education classroom (McCloskey, 2016). If professionals and guardians of a child with

special needs decide that the child must attend a separate school, the school district would be responsible for the cost of the placement (Legislative Analyst's Office, 2021). The cost of transferring a student with a disability to a private special education school varies; however, on average, the attendance of a non-public school placement for a student with special needs ranges from $28,000 to $40,000 annually (Chang, 2019). Instead of having the schools spend thousands of dollars to place children with special needs in separate schools, districts can use the special education funding to bring in behaviorists, therapists, special education teachers, and any other professionals necessary to provide supports in the LRE. Schools can also use the funding allocated to place children in self-contained settings to provide general education teachers with quarterly professional development opportunities and monthly meetings with behaviorists and other professionals.

Directions for Future Study

A limitation in this literature review is a lack of studies on teaching strategies for children with severe special educational needs, such as Level 3 ASD. Children with Level 3 ASD are more likely to attend separate schools and less likely to integrate with their same-aged and typically developing peers. This literature review focused more on children with mild to moderate ASD due to the limited information on children with severe ASD. Future studies should emphasize the impact of inclusive teaching strategies specifically for elementary-aged children with Level 3 ASD.

Another limitation in this literature review is that it does not explore whether or not gender, cultural, or racial and ethnic differences of students with ASD impact their social-emotional and academic development. ASD did not gain recognition until 1980s, and most research in this literature review did not account for these factors, even though boys are four times more likely than girls to be diagnosed with ASD (CDC, 2020). Steinbrenner (2022) found that White students with ASD were far more likely to be included in general education with inclusion than other racial and ethnic categories, such as Hispanic, Black, and Asian students. Taking these factors into account for future studies would benefit students with ASD.

Summary

This literature review examined the impact inclusive teaching strategies have on the social-emotional development and academic success of elementary-aged students with ASD. Most elementary-aged students with ASD struggle with social-emotional development and academic success in areas such as reading and mathematics (Bullen et al., 2022; Gev et al., 2025). The diagnoses of ASD continue to increase, and with schools across the United States transitioning to an inclusive learning model of education, it has become increasingly important to examine teaching strategies to support the needs of students with ASD (CDC, 2025; Locke et al., 2021; Markham & Jones, 2024). This literature review explored various strategies to support students with ASD in developing social-emotional development as well as mathematical

and reading skills. Strategies such as relationship building, Differentiated Instruction, and graphic organizers have yielded positive results (Barna et al., 2024; Bassette et al., 2019; Bethune & Wood, 2013; Bolourian et al., 2021; Bouck et al, Gev et al., 2025; Kerrigan et al., 2021; Rice et al., 2024; Solari et al., 2022). Although many strategies support students with ASD in developing social-emotional and academic skills, teachers getting to know their students and identifying the best strategies for each child is essential in an inclusive educational setting (Bassette et al., 2019).

Although many strategies have yielded positive results, these strategies will not be successful in supporting students if teachers do not receive adequate training on how to implement these strategies (Locke et al., 2021). This literature review included practice and policy changes and identified directions for future studies on the impact of inclusive teaching strategies for elementary-aged students. With more scholarly works and improved teacher preparation and support, schools across the United States can implement effective inclusive teaching strategies to support all elementary-aged students with ASD in meeting social-emotional and academic goals while creating an equitable learning experience for all children.

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The Impact of Technology in Early Childhood Classrooms on Students' Academic Achievement

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Abstract

Education is constantly adapting to societal changes and implementing new resources to best engage students. Following the COVID-19 Pandemic and the Fourth Industrial Revolution, classrooms worldwide have adopted new teaching practices with an emphasis on technology implementation. The increased use of technology in preschool classrooms to college lecture halls has caused a subsequent increase in research on how technology impacts student achievement and engagement. This research study examined the technological impact on student academic achievement in early childhood classrooms. The implementation of technology and different digital devices' use and impact on student academic achievement, cognitive development, and motor development was examined in this study. Findings revealed that technology implementation in the classroom helped improve motivation, engagement, and gave students more opportunities to display their level of understanding in various virtual and/or digitally supported assignments. New technology resources were also found to support students in their computing skills, improve collaboration, and higher-order thinking skills. However, the overuse of technology in the classroom has also been shown to cause motor development delays, emotional regulation problems, and language delays in students due to the overstimulating content.

Chapter 1: Introduction to the Project
Background

Following the Fourth Industrial Revolution and the COVID-19 Pandemic, education has shifted with classrooms of all ages and demographics worldwide increasingly adopting educational digitally-based tools to create "high-quality" educational experiences (Paul et al., 2023). School districts have implemented various technologies into classrooms in an effort to support diverse learners. These changes in technology are also intended to adequately prepare students for a society that has become digitally based. Students will now enter a workforce that is centered in a variety of technological systems. To be prepared for this new era of society, students must learn how to use and interact with new technology. Common technological tools now found in classrooms include: Chromebooks, tablets, interactive whiteboards, and smart TVs. With society shifting to become more technologically centered, and dependent on technological tools such as information systems and the spread of

automation, having access to these tools can be vital to developing an effective and well-rounded education. In a study on the changes in the diversity and development in recent years classrooms, traditional classroom styles of learning with pen and paper have been found to fall short of providing effective, student-centered learning environments for most students (Haleem et al., 2022). Providing an educational experience that is high-quality and equitable for all learners in modern-day classrooms requires educators to adopt technological-based teaching practices alongside the daily use of educational technology for their students. Especially in a post-COVID-19 educational environment, having not only accessibility but comfort in using technology has proven to be pertinent to conducting lessons of all kinds. A study conducted by Gray and Lewis from the Institute of Education Sciences (2021) found that, in the 2019-2020 school year, over 80% of public schools nationwide provided all students with access to a computer for academic use.

Educational technology is beneficial in early childhood education classrooms as it provides opportunities for educators to adopt student-centered pedagogies that cater to diverse learning styles and better connect with the new generation of digital natives, a name given to students who have been raised surrounded by various technological tools (Criollo et al, 2021). Technology in the classroom enables students to receive personalized learning pathways, granting them autonomy over their learning. Student autonomy has been shown to encourage self-directed learning that can establish life-long learning strategies. (Kalyani, 2024). Early childhood education is a period that is crucial for children's development and learning. The childhood experiences that occur from birth to age eight can have a profound impact on brain development. Establishing a foundation of support and positive experiences during this developmental period is crucial for future learning, and overall development as an individual (North Carolina Department of Health and Human Services, 2019). Educational environments are designed to serve and assist in this matter, by teaching students in their core developmental years lessons in intellectual and social skills. Implementing new technological tools into early elementary classrooms has been found to improve problem-solving skills, metacognitive skills, creativity, and social skills (Liu et al., 2023). Establishing a strong understanding of foundational skills such as problem-solving and creativity can improve long-term academic success as students will be able to better approach complex high-level thinking problems. Higher creativity and strong problem-solving skills allow students to approach their learning in non-traditional ways, creating a learning environment that suits their needs and motivates them to gain a better understanding of their learning objectives.

The integration of technology in the classroom has become normalized in education in recent years. However, there is a limited understanding of how best to use these new tools in early childhood education (Liu et al., 2023). As a result of the rapid growth in the use of technology, many teachers were thrust into new curricula using digital tools. Teachers have not been adequately

trained in how to best use these new tools as a primary mode of instruction, creating the issue that this new technology is not being properly integrated into educational environments. Teachers are now expected to not only understand how to use new technologies themselves but also use them with enough proficiency to teach their students how to properly utilize these tools, as well as continue to teach state-adopted curriculum standards. The lack of training in this area has increased teacher burnout which negatively impacts teacher-student relationships and the overall school environment (Bourlakis et al., 2023). A positive school environment for both teachers and students is necessary for academic growth because it contributes to classrooms feeling safe, welcoming, and comfortable. Educators worldwide are also faced with the obstacle of implementing technology into the classroom without fully understanding the developmental impacts of these new tools on young students. Due to technological tools only becoming commonplace in classrooms in recent years, there has been limited research on the long-term effects of technology in classrooms. However, research found increased screen exposure at a young age can influence cognitive development and attention span, key factors in young children's learning (Karani et al., 2022).

Education is entering an unprecedented era, and the implementation of technology has been shown to be necessary for students to receive a well-rounded academic experience and prepare them for a digitally-based society. However, there are many unknown impacts on student learning and well-being with the integration of technology into daily instruction. Technological safeguards are also needed to protect students from the negative effects of the overuse of technological tools.

Statement of the Problem

Following the COVID-19 Pandemic and recent technological advancements, schools shifted focus away from traditional pen-and-paper teaching practices to a more technologically centered approach. Haleem et al., (2022) stated that digital technologies and the implementation of these technologies in classrooms have become essential to ensure that classrooms are inclusive and high quality, effectively engaging with increased levels of learning for all students. However, a problem arises, as little is known about the impact of the daily use of technology on students' academic performance, such as their grades and performance on assessments. Across the nation as well as across all elementary grade levels, reading and math scores have decreased compared to pre-Pandemic scores (Crone et al., 2023). Following the Pandemic, education needed to reframe and revise traditional teaching methods to adapt to the new reality of hybrid schooling and address the declining reading and math scores that followed the Pandemic. Despite the need to review and update traditional teaching practices, educational technology is still a new tool being implemented in classrooms. This newness does result in limited research on the long-term effects of its use in the classroom. Educators are aware that establishing

foundational skills in early childhood education, such as phonemic awareness or number sense, is crucial to students' future academic success.

Educational technologies have been implemented into the classroom to help address the lowered assessment scores and better support students in their learning. Some educators have assumed that the new generation of digital natives are comfortable with and are supported in their learning using technology as individuals who have only ever known a life surrounded by digital technology (Criollo et al, 2021). Technology use increases the amount of student data and student responses to assessment and assignments that are collected. The increased data collection gives opportunities for teachers to vary assessment and assignment options for students based on their needs. This also allows teachers to increase scaffolding in student learning based on the data technological tools collect on student work. However, not all early education students can differentiate between utilizing technology such as tablets, or interactive screens from play and their learning. Teachers are expected to instruct students on the proper use of technology in the classroom, in addition to state curriculum standards, while also abiding by health organization guidelines on young children's screen time limits.

As more technology is incorporated into daily teaching, more obstacles arise. The impact technology has on cognitive function for early childhood education students is unknown. Technology and screens have been found to create distractions and limit attention spans in children of all ages (Mupulla et al., 2023). It is also unknown what increasing tablet and computer use will do to young children's motor skill development. As students use fewer traditional assignments and tools such as paper, pencils, and scissors, it is unclear how they will develop fine motor skills. A lack of motor skills can impact not only academic success but also create physical obstacles for students.

Purpose of the Project

This project aims to reveal the impact of technology implementation in early childhood education classrooms on student learning and grades as assessment results. This research project will explore the long-term impact of technology on student academic achievement in primary education. In the past few years, technology implementation in early childhood classrooms has increased threefold (Paul et al., 2023). This increase in technology use largely follows the COVID-19 Pandemic that forced schools to adapt to hybrid or online formats as well as combat the decreased assessment scores. The academic schools' years following the Pandemic resulted in lower test scores in reading and math nationally (Crone et al., 2023). To address lower test scores and engage with students' learning, educational technologies were implemented in classrooms. As technology continues to become increasingly prevalent in daily instruction, educators are exploring academic impacts, both positive and negative, on students in their academic performance and achievement.

A gap in the research exists in evaluating and understanding the long-

term effects of technology in primary education classrooms (Gentile et al., 2023). This research project explores the long-term impact of technology on academic achievement in daily classroom instruction by researching the implementation of technology in early education. This project examines multiple factors that could impact student academic achievement while using technology in their daily learning. In Chapter 2, the Literature Review, explores studies on the academic performance of primary education students who utilize technology in their daily instruction compared to students who do not use technology, or as frequently. A review of the literature will also examine the impact technology has on the cognitive and motor development of young children. A significant amount of research targets the implementation of technology in secondary school or higher education however, early childhood reach is limited and it is the crucial developmental stage. This study will also explore the long-term effects of technology on academic achievement in early childhood classrooms by examining technology implementation from preschool to second grade.

Theoretical Framework

The theoretical framework that will guide this research project is the Multimedia Learning Theory in the book Multimedia Learning (Mayer, 2021). The theory of Multimedia Learning is that multimedia instruction or utilizing words and visual aids helps foster and support learning (Mayer, 2021). The research conducted in this project will examine multimedia instruction and learning using technology. Specifically educational technology as seen in the classroom used to present different learning objectives such as connecting words and pictures through videos, online games, slideshow presentations, and other various visual aids. Mayer (2021) suggests educators follow three principles for digitally-centered multimedia learning to be successful and not cause cognitive overload in students.

The three principles of Multimedia Learning Theory to prevent cognitive overload are the segmenting principle, the pretraining principle, and the modality principle (Mayer, 2021). The segmenting principle approaches teaching by breaking learning objectives into smaller manageable pieces to understand. The pretraining principle is teaching vocabulary and key concepts prior to a longer lesson. Finally, the modality principle focuses on the incorporation of text, media, and auditory scaffolds to foster learning and avoid mental overload (Mayer, 2021). Using technology in a manner that follows each principle allows students to enter essential processing, a mental process that focuses on establishing essential learning material in students' working memory. Through each principle students are supported in their generative processing, the mental process of creating coherent structures and prior knowledge connections, allowing them to better understand learning objectives, and demonstrate higher academic achievement (Mayer, 2021).

Definition of Key Terms

The following key terms will be used throughout this research project as the implementation of technology in daily instruction in early childhood classrooms is explored.

Artificial intelligence (AI): Computer systems that can perform complex tasks and simulate human reasoning, creation, and decision-making (May, 2024).

Cognitive Development: The growth of thinking processes such as problem-solving skills, reasoning skills, and creativity (American Psychological Association, 2018).

Digital Natives: Individuals who have only lived in a society with digital technology and are comfortable with using various technologies (Criollo et al, 2021).

Early Childhood Education: Early childhood education includes preschool to second grade.

Flipped Classroom: An instruction practice that blends online learning with in-person instruction (Carstens et al., 2021).

Motor skills: The body's ability to perform various tasks and movements, either small movements or large physical movements (Adolph & Hoch, 2020).

Multimedia: Multimedia learning is learning through the combination of words and pictures through various styles of presentation (Mayer, 2021).

Technostress: High anxiety and stress brought on by the use and implementation of technology in daily life (Alam & Mohanty, 2023).

Summary

Following the COVID-19 Pandemic, academic performance on assessments has declined in both reading and mathematics (Crone et al., 2023). The Pandemic and continued increase of technological development in the world have forced classrooms to adapt and incorporate various technological tools into the classroom and everyday instruction. This new digitally driven reality has created a need to address how technology is impacting early childhood education classrooms and student learning. To address continuously falling assessment scores in both math and reading, as well as to properly prepare students for a world that is run by technology, educators have adopted multimedia learning approaches. Multimedia Learning Theory is an instructional practice that fosters better student engagement and learning through using instruction that combines words and various visual aids (Mayer, 2021). Technology in the classroom that follows multimedia learning practices can support learning foundational skills in primary education classrooms, thus supporting students in achieving learning outcomes. Multimedia learning is necessary for implementing technology use in the classroom, as it guides teachers in using digital tools efficiently and effectively. Students using the Theory of Multimedia Learning can gather data that can address the gaps in the literature for how

daily technology use affects early education students, their learning, and development. This research project examines the impact of technology use in early childhood education classrooms by researching the effect of technology on academic achievement, cognitive, and motor development in primary school children.

Chapter 2: Review of Related Literature
Introduction

Following the fourth industrial revolution and the societal shift to a technologically- centered lifestyle, education has entered a new era of digitally-driven learning, changing the way teaching and classroom management is now approached (Alam & Mohanty, 2023). In the past five years, due to changes imposed on schools as a consequence of the Covid-19 Pandemic, as well as societal demands, education has drastically evolved in terms of technology implementation in daily instruction practices. Assessment scores have decreased following the Pandemic and have not fully recovered to pre-Pandemic assessment scores, but technological tools can better engage students and help in achieving an understanding of the retention of classroom instruction in students (Crone et al., 2023).

Following the Pandemic, the increased advances and reliance on educational technology have led classrooms to adopt more digitally focused teaching practices (Kalyani, 2024). As technology continues to become more prevalent in classrooms, educators have begun evaluating the benefits of digital tools in the classroom on student achievement, as well as evaluating the hindrances these tools may cause (Liu et al., 2023). Reimann and Aditomo (2020), revealed that students who engage with learning games and content of this nature that connects higher-level thinking as well as surface-level understanding develop a better grasp of learning objectives. However, these games also have the potential to be a hindrance to both educator and student when it comes to the appropriate level of screen time within the classroom setting.

With the use of technology, educators can create lessons and activities that utilize a multimedia approach, by combining videos, pictures, and graphics alongside the definitions and words of the various learning objectives that are being targeted. Using Mayer's (2021) Cognitive Learning Theory of Multimedia Learning with a focus on academic achievement in early childhood education classrooms it can be better understood how technology use and multimedia instruction impacts education. Multimedia Learning is learning and instruction that combines visual aids with words. These visual aids can be used through pictures, graphics, videos, or models.

Academic Performance with Technological Aids

Educational institutions have adopted various digital resources and tools with the intent of better engaging with students, and properly preparing them for the modern digital workforce they will enter after their academic experience is complete. With technological advancements becoming more in-

tegrated in everyday life, students at a young age are becoming more adept with different devices, which can be beneficial in a learning environment. The use of digital tools has been implemented into daily classroom instruction as a way to further familiarize and develop technological literacy in students. These tools have also shown to increase assessment scores and understanding of various learning objectives. Technological tools have expanded the gamification of lessons in early childhood education classrooms, which better engages students in learning, allowing for higher retention of information (Manire et al., 2023). The resources technology offers educators has increased student independence, increased the collection of student data, as well as improved the assessment process in the classroom.

Technology Integration in Daily Instruction

The use of technology in daily instruction in primary schools has greatly increased in the past five years to better engage and accommodate a new generation of learners (Carstens et al., 2021; Gray & Lewis, 2021). Classrooms worldwide have adopted technology such as AI, laptops, tablets, interactive whiteboards, and various assistive tools into daily instruction practices (Su & Weipeng, 2022; Su & Zhong, 2022). These tools are used to scaffold new and previously learned learning objectives throughout daily instruction. New pedagogies have also been developed and adopted to create the most effective teaching practices that utilize new educational technologies. These new pedagogies approach teaching through play-based learning, emphasizing the importance of social inclusion and collaborative learning (Manire et al., 2023). There are many technological tools to gamify lessons and assist students in gaining knowledge as well as developing a deeper understanding (Dittert et al., 2021; Marsh, 2021; Mayer, 2021). Researchers have also found that to provide a well-rounded learning environment for students, technology must be incorporated into their instruction (Alam & Mohanty, 2023; Haleem et al., 2002). With technology now such an integral aspect of how society functions, it is important for classrooms to be able to integrate tech well. To better prepare students for the workforce, it has become vital that they are properly trained and are taught a healthy way to interact and use digital tools in their studies and work (Carstens et al., 2021).

Higher levels of technology implementation in the classroom have been the response by educators to the new era of the workforce and societal reliance on technology. Educational technology has numerous applications in the classroom. A variety of technologies were first implemented in special education classrooms. In these classes, it was found that the technological tools were able to be more efficiently implemented into curriculum than in general education classrooms. This is due to the use of assistive technology in the special education classrooms which was able to support students in their work and in expressing themselves. This could look like text tools, tablets that allow students to communicate, digital visual aids, or auditory aids (Paul et al., 2023). Early education classrooms have adopted technological tools to assist

with language development and mathematics instruction. According to Su and Weipeng (2022), new AI technologies have been implemented into early childhood education classrooms to create lessons that are tailored to students and their needs in relation to their language and reading development as well as their understanding of different mathematical concepts. AI tools in classrooms are also used to assess students through diagnostics that adapt questions based on student responses and demonstrated knowledge. This technology is used to improve language development (Su & Weipeng, 2022). Interactive whiteboards, interactive digital lessons, and digital visual aids are used throughout daily instruction to scaffold learning objectives, and differentiate instruction (Outhwaite et al., 2023).

Despite technology's goal of increasing assessment scores and improving overall student understanding of formative learning objectives, state testing scores across the country have continued to fall below assessment scores prior to the COVID-19 Pandemic even with increased use of technology in daily instruction (Gray & Lewis, 2021). It is crucial that educators, administrators and schools continue to evaluate which technologies will benefit student learning and development. Su and Weipeng (2022), found that tangible technological tools implemented in the classroom are effective in increasing engagement and motivation, which in turn improves overall student learning; however, the ongoing effects of technology implementation at high levels in early childhood education classrooms remain unknown. There is still limited research on the long-term impacts of increased technology use in the classroom due to much of it being newly developed within the past five years. Despite better engagement and motivation in the classroom, assessment scores continue to fall, rather than increase (Grey & Lewis, 2021). These lower test scores could have been influenced by higher rates of anxiety found in the new generation of students, as well as the decreased attention spans found within this new generation of students.

Technology Support in Academic Achievement

As classrooms shift towards a more technologically centered instructional approach, teachers and students have explored untraditional methods of learning various objectives and foundational skills. Utilizing technology in the classroom has given students autonomy over their learning like never before. According to Haleem et al. (2022), students have been able to shape their learning through various digital applications that help them express their areas of interest as well as areas requiring further support. This sense of autonomy over their learning has been found to increase engagement in the classroom as well as motivation, as students have displayed higher levels of motivation and enjoyment when their voice is heard in the classroom (Carstens et al., 2021). Students who are digital natives or children who have grown up surrounded by digital technologies have shown ease in their learning and in the classroom when they are able to use various technologies. Mobile devices that teach learning objectives through videos, games, interactive practices, and digi-

tal books have been shown to better engage students and grow their academic skills (Criollo et al., 2021). Students have also been allowed to demonstrate their understanding on different learning objectives through assignments and assessments that are conducted through various digital platforms instead of traditional pen-to-paper assignments. Digital presentations, voice-to-text assistive applications, and AI adaptive assessments have been implemented into classrooms to allow students to be both formally and informally assessed. Students who may have previously performed poorly on summative assessments are now offered different formats in which they can demonstrate their knowledge on a chosen subject (Liu et al., 2023; Outhwaite et al., 2023). Technology scaffolds and interactive digital tools have also been found to increase collaboration and problem-solving skills between peers as they are able to work together to complete various online assignments. The gamification of lessons through digital resources has also been found to improve overall student engagement and students' ability to demonstrate their understanding of what they learned through dialogue with their educator and peers (Kaylani, 2024; Timotheou et al., 2023).

Digital tools and technologies have allowed teachers to gain a better understanding and more resources to teach various learning objectives. Digital technologies have also served to support teachers in becoming better equipped to address all student needs, as they can use online resources to create scaffolds, extended lessons, and reviews with these new tools (Haleem et al., 2022). The increased number of resources, tools, and aids that can be implemented in the classroom has allowed teachers to individualize lessons for students while increasing the teachers' ability to directly instruct students, as their lesson planning time has reduced with the aid of technology (Haleem et al., 2022; Timotheou et al., 2023). This individualization of lessons has been found to be effective with neurodivergent students and students in special education classrooms. Technology has opened many paths to success for special education students, or students who require Individualized Education Plans (IEPs). Digital technologies and touch screen tablets allow students with physical disabilities alternatives to creating and completing assignments that they may not have been able to complete prior to the introduction of technology in the classroom (Wen & Walters, 2022). Gunnars (2024) asserted that some digital programs grade and evaluate students as they complete their work. Various online programs have also been created to support special education classrooms, offering scaffolded and modified lessons that target areas of struggle while maintaining a high level of academic rigor for these students. Technology has also been found to improve overall school communication, which supports academic achievement in students. With the aid of technology, teachers can grade, sort, and evaluate students' work at a faster pace. Haleem et al. (2022) reported that, with the assistance of digital tools, teachers can assess students more quickly and accurately, allowing them to provide support, reteach, or review specific students' requirements to achieve academic success.

Technological Impacts on Grades and Assessments

Faster evaluation of student work has served as a preventative measure in addressing students' areas of struggle before students fall behind in their learning, leading to higher levels of academic achievement. During the Pandemic, technology was used as a necessity for teachers to instruct their students, but following the Pandemic, the view and use of these applications shifted to a resource that can target student learning to improve grades and assessment scores (Carstens et al., 2021). Educational technology is now an essential resource for teachers to utilize in the classroom to teach state standards and diagnostic standards. The California Department of Education established guidelines on integrating various technological tools into daily instruction in the most effective manner (CDE, 2021). This is in an effort to relegate the amount and form of technology in classrooms as well as address falling standardized test scores across the state (CDE, 2021). Studies have shown that utilizing mobile devices and different technologies in the classroom blurs the lines between formal and informal assessments. This blurring of lines has allowed students to feel less pressure, better engaged, and, in turn, better perform on various assessments (Alam & Mohanty, 2023; Criollo et al., 2021). Despite the benefits of increased engagement and motivation for early literacy, reading levels continue to fall below those of previous academic years. Nationwide reading and math scores have been lower than scores before the Pandemic (Crone et al., 2023). The falling literacy rates have negatively impacted other subjects outside of literacy. Crone et al. (2023) revealed that students who do not develop foundational skills such as phonemic awareness or number sense by the time they finish second grade will continue to fall behind their peers as they continue their overall education.

Assistive and educational technology has been found to be more beneficial to some students than others (Paul et al., 2023). Studies analyzing the impact technology has on assessments and academic performance revealed that some students presented no academic difference when using digital tools compared to students who did not use technology in their daily instruction (Paul et al., 2023). The lack of improved assessment scores calls into question the validity of various educational technologies. Although digital resources in the classroom increases initial motivation in learning, it may not be as effective in long-term retention of information. Educational technology continues to grow and develop rapidly. As these new technologies are incorporated into the classroom and daily instruction, educators must evaluate the benefits of student learning and how to effectively use these tools.

Technology's Impact on Cognitive Development

Educational technology has large impacts on the cognitive development of children from birth to the age of eight years old (North Carolina Department of Health and Human Services, 2019). New digital resources have been adapted into educational environments to introduce new ways for students to interact with the lesson plans and one another. These technolo-

gies have shown to help young students build upon their collaboration skills, language development, and high-order thinking skills. However, there are still problems that can arise with the integration of digitally based learning materials into classroom instruction due to the dangers of overuse. Overuse of technology, especially at a young age, has been shown to be overwhelming, and a cognitive burden (Karani et al., 2022). If technology is brought into the classroom to an excessively high degree, it poses the risk of impeding a student's development rather than supporting it.

Early Childhood Cognitive Development

Panjeti-Madan and Ranganathan (2023) found that regardless of technology implementation in the classroom, early childhood education is a vital period for young students due to the importance of this cognitive developmental time. The brain and mental development for children between birth and eight years old is crucial because it establishes the brain's architecture and prepares the child for lifelong learning (North Carolina Department of Health and Human Services, 2019). The formative experiences of young children, positive or negative, have an immense impact on how a child will continue to develop, as well as impact their ability to have high levels of cognitive function. Children in this stage undergo rapid brain development, which emphasizes the importance of what children are exposed to as they mature mentally. As classrooms shift to adopt a more technological approach to daily instruction, it is important to monitor the use of technological tools to ensure it is used to bolster positive formative experiences (Gray & Lewis, 2021). Utilizing technology in this way can increase higher-level thinking among young students.

Technological Benefits for Cognitive Development

The integration of technology in early childhood education classrooms has become more prevalent in recent years as it has shown to better support and engage students in their learning. Educational technology and digital devices can create more equitable environments for students as they allow students to demonstrate their knowledge in untraditional ways while at the same time, receiving faster evaluations on their work (Haleem et al., 2022). Students who have autonomy over their learning demonstrate a better understanding of learning objectives. New educational technologies allow teachers to cater to all learning styles and needs by designing activities that are more diverse and engaging, offering students the chance to complete assignments that they better connect with (Kalyani, 2024). According to Bedford et al. (2016), technology has become more popular in early education classrooms due to its benefits to language development and computing skills. Gath et al., (2023) found that young children benefit from taking part in read aloud activities. By hearing different stories from different speakers, young children are able to grow in their language development by being exposed to new vocabulary and growing in their phonemic awareness (Gath et al., 2023). Assistive technology now allows students to use tablets, digital readers, or computers to read stories, assignments and tests aloud to them. This has helped students in-

teract with different tools and formats to grow in their language development. Technology also increases the variety of content exposed to young students. This benefits language development as they can access media that will produce different reading or auditory content that addresses different subjects, cultures and traditions students may not otherwise have access to prior to the introduction of digital resources in the classroom. This exposure to new subject material expands young students' vocabulary as well as strengthens their awareness of different sentence structures (Bhutani et al., 2024). The implementation of computing technology in early childhood classrooms has been found to improve problem-solving skills, metacognitive skills, as well as creativity and linguistic skills (Liu et al., 2023).

New educational technologies can also increase student interaction with various science, technology, engineering and Math (STEM) fields and subjects. Students who interact with technology related to these fields and become familiar with computing and problem-solving skills at a young age have shown increased motivation and participation in various STEM fields (Liu et al., 2023). Establishing computing and problem-solving skills at a primary level assists students in becoming more technologically adept and developing their higher thinking skills. Liu et al., (2023) found that these skills will be beneficial to them as they continue to grow in their academic experience, and as technology takes even more complex forms in society. Technology has also opened the doors to gamifying lessons that target key learning objectives. Timotheou et al., (2023) discovered that the gamification of lessons helps improve motivation and literacy skills through the rules and regulations of various learning games. Digital games have also been found to help develop problem-solving, collaborative learning, and encourage higher-level thinking skills (Bedford et al., 2016; Criollo et al., 2021; Timotheou et al., 2023). Skills such as problem-solving and collaboration are integral to creating a foundation for learning. Establishing them through technology as key components in early childhood education gives students solid building blocks to continue to build from within many subjects.

Technological Impacts on Cognitive Development

Despite the benefits of introducing technology into early childhood education classrooms, Karani et al. (2022) and Bhutani et al. (2024) asserted that there are negative impacts that these assistive tools may have on young students and their mental health with the risk of overexposure to technology. The American Academy of Pediatrics (AAP; 2025) has created health guidelines for screen exposure for children in early childhood years. The AAP (2025) and Panjeti-Madan and Ranganathan (2023) asserted that most children are overexposed to various technologies and exceed the recommended technology use time to prevent cognitive delays. Children's learning videos, visual aids, and digital programs have become identified by bright colors, fast-paced content, and large characters. These characteristics have been found to be cognitively burdening children, causing cognitive developmental delays (Karani et

al., 2022). The fast-paced content and bright colors can be overstimulating for young children, preventing them from absorbing or comprehending the material. Bhutani et al. (2024) asserted that children who are continuously exposed to "baby education" videos have shown delays in vocabulary and language development as they only know the language that is deemed child-friendly, and do not understand language that is outside of this form of media.

The frequent use of passive activities such as watching videos has also negatively impacted the classroom and been found to hinder children in their cognitive development (Gath et al., 2023). Increased use of technology of this nature in the classroom takes away vital moments of communication between teachers and students, reducing the quality and quantity of conversations in the classroom. Restorative practices such as morning meetings and collaborative learning moments in the classroom have shifted from being a practice completed between actively engaging students in-person to activities completed through devices (Muppalla et al., 2023; Paul et al., 2023). The reduced number of conversations in the classroom due to the use of digital technology has led to an increase in unregulated emotions in young students. Students who spend more time using digital technology or devices with screens have fewer formative conversations with adults, causing their inability to properly express themselves or communicate their emotions (Gath et al., 2023). The inability to regulate emotions in the classroom has increased the number of outbursts and disassociated moments for young children negatively impacting their learning and development.

The introduction of technologies in the classroom has provided a new range of distractions for young students. Screens, tablets, and computers have allowed students access to content and material that is outside of the learning goals. While separate technology has been created to attempt to limit and regulate the content available, it can only be monitored so much. Having access to digital resources has been shown to be distracting for students, allowing them to easily defer from completing their work (Kalyani, 2024). Screen use is recommended to stay under an hour for children in early childhood ages; however, with technology use at home being an uncontrolled variable, it is impossible to accurately limit screen use to the appropriate time frame within a classroom. There are children exceeding the recommended screen time guidelines recommended by public health organizations in varying degrees. The overexposure of screens has been found to reduce attention spans, create behavioral problems, and developmental delays (McArthur et al., 2022). Excessive exposure to screens and digital devices has also been found to impact executive function and working memory in young students. Adolescents who use technology daily have been reported to have lower attention spans, lower executive function, the inability to multitask, as well as a weaker ability to process and integrate information (Muppalla et al., 2023). Technological devices have become like security blankets or other comfort mechanisms for children. Children with higher screen-time use have been found to be unable to emotionally regulate

themselves without a technological device (Ponti, 2023). Paramita et al. (2023) asserted that this inability to emotionally regulate has led to higher amounts of anxiety and depression found in young children. As educators continue to implement digital resources into the classroom, they must continue to evaluate the negative impacts these tools may have on the cognitive development of their students. Educators everywhere will be responsible for ensuring these tools are utilized in a developmentally appropriate manner.

Technology's Impact on Motor Development

Classrooms worldwide have shifted away from traditional assignments that utilize writing utensils, paper, scissors and glue instead adopting digital approaches to classwork and assessments. The shift to a more digital classroom experience has changed how young students develop motor skills in their daily instruction. The physical habits children establish in early childhood have been found to continue on in adolescence and adulthood. Physical movement and the ability to use various motor skills has been found to impact students' ability to retain information and emotionally regulate in and outside of the classroom (Paramita et al., 2023). As digital devices are more heavily utilized in primary education classrooms, students are less exposed to activities that have been used in the past to further develop and refine motor skills.

Early Childhood Motor Development

Early childhood development not only involves the growth of cognitive skills, but also the growth of motor skills and physical proficiency. Motor skill development can be defined in three different stages: motor learning, motor control, and motor development, which all deal with the ability to send neural signals to successfully perform a physical response or behavior in the body (Beach et al., 2023). In early childhood development, young children build their fine and gross motor skills. Fine motor skills are the skills that utilize smaller muscles in the body and tend to focus on building small movements and hand-eye coordination. Gross motor skills utilize larger muscles and focus on larger body movements (Cava et al., 2022). Benda et al. (2023) asserted that physical activity in early childhood development is crucial for young children to gain physical dexterity, coordination, and overall body development. The activity levels young children demonstrate during early childhood development establish patterns of lifelong behavior, whether that involves a high level of physical activity throughout adolescence and adulthood, or more sedentary behaviors. Motor development, and the ability to attain physical proficiency to take part in active behaviors, has been shown not only to help physical development but also contribute to cognitive development and social-emotional development (Benda et al., 2023). As more technology has been implemented into daily schedules and life, the development of motor skills and opportunities for physical activity have decreased for children. There are technologies being developed and introduced, however, that are designed to build upon these skills and create more opportunities for physical development.

Technological Benefits for Motor Skill Development

The use of technology in early childhood classrooms has significantly increased in recent years. There are benefits these tools have on cognitive and academic development, but motor development is often overlooked. Touch screen tools have made it easier to access as well as have increased the use of fine motor skills in young children as the learning games that children are often found using help improve finger and hand dexterity (Bedford et al., 2016; Bossavit & Arnedillo Sánchez, 2023). Physical education teachers have reported the benefit of various digital exercise tools to use in early childhood classes as they can expand the lessons, games, and movement they incorporate in curriculum with the use of these tools. This has been shown to bridge the gap between digital native students and unfamiliar physical movements. These tools also help connect physical movement with other subject matters that students are learning, which has established stronger motivation to participate as students feel more connected to the learning material (Doncheva et al., 2021). Increasing movement and developing gross motor skills have been found to improve overall health in young adolescents. The development of motor skills is imperative to children's overall development and sets a precedent for their academic future. Katagiri et al. (2021) found that early motor difficulties in preschool children contributed to lower academic performance and more social-emotional behavior problems.

Educational technology is extremely beneficial to neurodivergent learning, as it can target specific needs for neurodevelopmental learning (Paul et al., 2023). Neurodivergent learners have been reported to have more difficulties developing fine and gross motor skills, resulting in poorer academic performance and higher emotional instability (Katagiri et al., 2021). New technology allowed lessons to be physically interactive, gamified and collaborative, which has shown to better target the needs of non-traditional learners, including neurodivergent students, helping them to develop their motor skills, and better retain information (Unheim, 2022). New classroom technology has also been shown to increase students' independence, allowing students to explore their learning in a new interactive manner. Technology in the classroom encourages students to take charge of their learning. Timotheou et al. (2023) found that gamification is an effective way to help children develop and learn. Students who take part in digital play, or play that is interwoven with various education technologies, encourage students to engage more deeply in their learning, grow in their physical development and increase their autonomy in how they interact with education (Carstens et al., 2021; Unheim, 2022). Students developed a comfort level with technological tools in the classroom, enabling them to create and guide their own learning by using digital resources to shape and develop lessons tailored to their needs. Technology has also helped increase the independence of special needs students. Multimodal learning tools have allowed students who have physical disabilities to have access to tools that assist them in fine motor skills, which allows them to be more active

participants in their learning (Wen & Walters, 2022).

Motor Developmental Delays Due to Technology

Conversely, Song et al. (2025) and Orunbayev et al. (2024) found that technology can have adverse effects on the development of motor skills in young children. Katagiri et al. (2022) found that the lack of movement and motor development skills in preschool children has resulted in lower academic performance, higher emotional instability, and lower social skills as these children grow. Physical activities help young children regulate their emotions as their body creates various chemical reactions to help improve emotional intelligence and balance high emotions (Paramita et al., 2023; Song et al., 2025). The increased use of technology in daily lives and in school has resulted in children demonstrating more sedentary behaviors (Paramita et al., 2023). Rather than participating in physical movement or activities, children are more likely to play on a tablet, computer, or other digital devices with a screen. This increased sedentary behavior has shown to increase emotional disturbances in early childhood students, negatively impacting their academic learning as well as their social-emotional learning (Paramita et al., 2023). Teachers have reported that technology implementation in early childhood classrooms has become normalized as a tool for daily classroom instruction (Liu et al., 2023). The increased use of digital tools in the classroom has reduced traditional approaches to learning, such as pencil to paper assignments, or cut and paste activities. As children complete assignments and activities digitally and chronically using digital tools, it has been found that young children are now dealing with balance issues, muscle weakness and posture problems (Orunbayev et al., 2024). Students struggle with holding pencils, using scissors, and completing other activities that require fine motor skills. The newfound difficulties due to a lack of motor skills have created a lack of stamina for students negatively impacting their academic achievement as they are unable to complete assignments that do not require digital tools (Carstens et al., 2021; Undheim, 2022).

Summary

Research revealed that technology use continues to expand in early childhood education, but that traditional teaching practices still have benefits to student achievement in this developmental period of life (Alam & Mohanty, 2023; Gray & Lewis, 2021). Traditional teaching practices will not be fully abandoned in early childhood classrooms but will be scaffolded with new educational technology tools. As technological tools such as tablets, assistive devices, computers, and interactive whiteboards are implemented into the classroom, educators need to understand the most effective way to implement these tools to support academic achievement while at the same time, avoid academic distractions that these tools can create (Haleem et al., 2022; Kalyani, 2024; Liu et al., 2023). Digital devices can support non-traditional learning styles by allowing students to gain autonomy over their learning through the vast resources and support that educational technology brings to the classroom. Educators and schools must investigate the best implementation techniques for digital

resources in the classroom to achieve higher academic achievement and better assessment scores, which is the goal of daily educational technology use in early childhood education classrooms (Dittert et al., 2021; Marsh, 2021; Mayer, 2021).

Students who gain a sense of autonomy over their learning through the use of technology are more engaged and motivated to obtain learning goals in the classroom (Alam & Mohanty, 2023). There is a limit to how much screen time and technology should be used in early childhood education. Overuse of digital devices may lead to sedentary behavior, emotional instability, and lower self-regulation (Muppalla et al., 2023; Paul et al., 2023; Ponti, 2023). Technology can create a distraction in the classroom for some students, reducing its effectiveness and harming cognitive development. Adolescents who have overexposure to digital devices have negatively impacted their executive functioning then impacts their ability to find academic success (Muppalla et al., 2022). Studies have shown that technology can improve and support the development of motor skills and motor function in early childhood (Bedford, 2016; Bossavit & Arnedillo Sánchez, 2023). Technology has opened new learning opportunities for all learners, and technological tools may be given to students to scaffold new information. In conclusion, the literature review validates the importance of increased use of digital tools in early childhood education classrooms with the knowledge that there are many different approaches to adapting technology for learning and teaching early childhood education.

Chapter 3: Implications
Introduction

Advances in technology have drastically transformed the approach to learning and teaching practices in a variety of ways. Educators now have access to a number of resources to assist academic, cognitive, and motor development in primary age students. Educational technology has increased in use in the past five years not only to provide a well-rounded educational experience in a technologically driven society, but also to address the falling assessment scores following the COVID-19 Pandemic (Alam & Mohanty, 2023; Grey & Lewis, 2021). This increase in educational technology tools in the classroom has created a shift in how educators and students view various technologies in their approach to learning and engagement. This study explores the impact of daily technology use on students' academic achievement and development in early childhood classrooms. Despite the new resources and support educational technology provides in classroom learning, assessment scores have continued to fall below scores prior to the COVID-19 Pandemic (Grey & Lewis, 2021). Cognitive and motor development skills are essential for early childhood education students because these skills are foundational for the learning objectives they will strive to achieve throughout their academic experience. The skills that students learn in early childhood classrooms are essential for them to grasp to become effective lifelong learners. To better prepare students

for the digitally-centered world and workforce that they will enter, educators and schools must effectively implement technology into daily learning practices.

This project examines the impact of daily technology use on academic achievement and overall student development in early childhood classrooms. As technology becomes increasingly essential in daily life, students must be taught how to engage properly with digital tools to understand how to communicate effectively with technological content. This project explores the academic impact of the daily use of technology in early childhood classrooms, as well as the cognitive and motor development of young children who interact with various technologies in their daily learning. A review of literature found that with effective and developmentally appropriate implementation, student academic achievement and overall development can be supported through the use of various technologies in the classroom.

Conclusions

Due to societal changes, technology has become a necessary tool in classrooms which has a significant impact on early childhood education students. Technology is a vital tool used in daily instruction to create high-quality learning experiences for all students as it increases motivation, engagement, and offers student autonomy through adaptive tools (Alam & Mohanty, 2023; Carstens et al., 2021; Haleem et al., 2022). As education enters an era centered on the use of technology, it is vital that students are taught how to properly engage with digital resources in and outside of the classroom. Technology will be incorporated into new generations' entire academic lives and careers. To be successful in their learning and futures educators must properly prepare students by educating them on how to use various technologies as tools and not potential distractions.

New resources introduced into the classroom through technology support both the teachers and the students. Technology provides teachers with resources that increase their knowledge on specific subjects, allowing them to diversify the assignments they give to their students and create more scaffolding opportunities (Haleem et al., 2022). The support teachers receive from these new tools allows them to have more time due to their assistance with faster grading and opportunities to create new activities that expand student learning. These technologies also provide students with more chances to display the level of understanding on new learning objectives.

Technology in the classroom provides resources to provide unique experiences for all learners to engage with learning materials that are the most effective to their learning style (Criollo et al., 2021; Gath et al., 2023; Kalyani, 2024; Undheim, 2022). The research also reveals that this generation of students are digital natives, so the use of technology in their learning allows them to feel more comfortable and engaged when being introduced to new learning materials (Criollo et al, 2021; Paul et al., 2023; Su & Zhong, 2022). It was found

that utilizing digital devices in the classroom better prepares students for the technology driven society. Technology has allowed students to gain a sense of autonomy over their learning. This independence has created different pathways for students to demonstrate their learning and engage deeper with educational materials. Technology creates resources for teachers and students to extend education opportunities and show knowledge in more personalized demonstrations (Manire et al., 2023; Marsh et al., 2021). Educators continue to adopt multi-media teaching practices that focus on student interaction with technology devices to increase motivation and extend retention of new learning concepts.

It was noted that not every student receives academic benefits from technology implementation in the classroom (Paul et al., 2023). The daily use of technology has been found to increase cognitive delays. The overuse of screens and technology has shortened working memory, and the lack of executive functioning skills in young students (Bhutani et al., 2024; Gath et al., 2023; Kalyani, 2024; Karani et al., 2022). Technology must also be implemented intentionally as research has shown that increased technology use has taken away vital developmental conversations in early childhood classrooms (Gath et al., 2023). Daily conversations between students and between students and their teachers are vital to student development. These conversations help develop students' communication skills, emotional intelligence, and vocabulary. Technology use in early childhood education classrooms is beneficial if it is used in a developmentally appropriate manner and follows screentime regulations. To be utilized properly and effectively teachers and schools must have an understanding of the best practices to implement these new tools.

Practice Implications

Some recommendations for schools and early childhood education classrooms include avoiding the overuse of new educational technology when implementing these resources in the classroom. New assistive technology programs now market themselves as the most effective venue to support teaching. Technological programs and curricula might collect data on student progress well in one domain, but may not holistically evaluate student progress or growth based on the reliability and validity of assessment questions. Some technologies may benefit certain schools and student demographics better than others.

Educators must evaluate which new resources will benefit their students the most. Teachers must also be adequately trained in new programs, curricula, and how to use these new technological resources. Teachers who are not properly trained in digital curricula have reported feeling high levels of anxiety and stress as they feel underprepared and even at times incompetent while using these new tools (Bourlakis et al., 2023). It is recommended that districts provide proper training for teachers to prevent educators from feeling overwhelmed, anxious, and underprepared to teach their students.

The attitude educators have towards the implementation of technol-

ogy in their daily teaching practices is crucial to its success in engaging and supporting students' learning. Teachers who are hesitant or resistant to introducing more technology use in the classroom have higher levels of anxiety in the classroom (Henderson & Corry, 2021). However, teachers who are open to utilizing new technology have been found to increase classroom efficiency and achieve more effective student engagement (Henderson & Corry, 2021). Teachers must express their concerns with new tools and programs implemented in the classroom to their administrators and advocate for training and support as classrooms continue to adapt to more technological practices (Fernandez et al., 2023). Teachers who incorporate their personality and adopt technology that supports their chosen pedagogy and teaching practices are their most effective selves (Göktaş et al., 2023). Despite the increase in daily technology use, teachers' attitudes are an essential aspect of the classroom environment and student success.

It is recommended that teachers research, and experiment with new digital tools to find the best practices in implementing technological resources into daily teaching. Interactive activities, gamification of lessons, and autonomy technology allow students to have a more engaging experience in the classroom and have been found to create more encouraging environments for students to become lifelong learners (Bedford et al., 2016; Gath et al., 2023; Liu et al., 2023; Su & Weipeng, 2022). However, it is vital that teachers consider the best uses of technology tools because not every student may benefit from technology use or they can become distracted by these new tools. The overuse of technology can also lead to motor skills delays, language development delays, and lower attention spans due to cognitively burdening digital programs (Karani et al., 2022; McArthur et al, 2022; Muppalla et al., 2022). Teachers must consider guiding students in their use of various technology resources, teaching them how to interact properly with these tools, and preventing improper use of technology. Teachers must be intentional in implementing new technology resources to best support student needs.

Policy Implications

It is recommended that school administrators consider the content of professional development required to effectively implement new technological resources into instruction. Bourlakis et al. (2023) found that teachers have expressed higher levels of stress and anxiety due to the increased workload brought about by incorporating new technologies into the classroom. Higher levels of anxiety negatively impact relationships between teachers and students. The lack of relationships in early elementary classrooms can be detrimental for students in their comfortability in the classroom and school in general. The higher levels of stress and anxiety reported by teachers are associated with feelings of being unprepared or incompetent with the new resources that teachers are now expected to implement in their instruction (Bourlakis et al., 2023; Fernández-Batanero et al., 2021). The feelings of being incompetent have caused higher levels of burnout and teachers leaving the profession, im-

pacting early childhood educational experiences. Teachers who have received proper training, support from their administrators, and are open to using new digital resources into their classrooms have found more success in engaging with students (Henderson & Corry, 2021). Districts must continuously provide professional development training for teachers, paraeducators, and school employees to learn the best use of new curricula and resources. Through professional development opportunities, educational leaders can collaborate and consider which resources will best support student needs in the classroom.

Educational technology resources continue to be introduced and improved as educators report classroom feedback on these new tools. Schools and districts must be open to adopting new technologies and open to change before schools officially adopt them. Trial periods are expected and necessary to ensure that the best resources, tools, and programs are used to engage students and support their learning needs. Haleem et al. (2022) reports that programs that are intentionally implemented and align with teacher pedagogies and teaching styles best support student learning as teachers are still able to form relationships with their students while receiving support through new technology resources. Districts and teachers must explore new resources to find the programs that best support them in their teaching practices, and what best supports the students that they serve.

Directions for Future Study

A crucial aspect of the daily implementation of technology in the classroom that is recommended for exploration is how the use of digital tools impact a teacher's approach to educating. There is impact digital devices have on pedagogical approaches to teaching which may alter a teacher's view of how-to best address student's learning needs. As digital resources continue to become more prevalent in the classroom, it is essential that research examines how this affects teachers' self-efficacy, attitude towards the profession, and mental well-being. This information could be studied in tandem with exploring if technology implementation in the classroom has an impact on teacher burnout.

The impact of how technology impacts school relationships is another potential area of study. This would include the dynamic between teachers and students interactions in the classroom. While studies have shown digital tools being useful for building collaborative communication with students amongst one another, high use of technology may have a negative impact on students' views and relationships with their teachers. Classrooms that are too heavily reliant on technology can lead students to view the digital programs that educate and grade them as the authoritative figure in the classroom, not the teacher. It also limits the direct communication that a teacher would otherwise have with a student which is part of the positive relationship building and trust that can be essential to a successful learning environment.

Another factor of technology implementation that to be considered is how to determine what tools are developmentally appropriate for different

levels of education and what would best benefit being placed in early childhood classrooms. This could include students, specifically in early childhood classrooms, and what resources serve to encourage their education without being overstimulating. Due to early childhood students having a higher sensitivity to technology in terms of their developmental process, conducting studies on the specific digital resources and how they should be adapted into classrooms could be beneficial for technology adept classrooms in the long term. As technology becomes increasingly a part of everyday life and learning, it is important to continue to review where its limits are, to prevent over reliance and overuse from both students and teachers. Future studies using the Theory of Multimedia Learning to explore student achievement and student-teacher relationships in relation to multimedia learning, as well as collect data on the gaps in research for student academic achievement in early childhood education classrooms that implement digital tools in daily instruction.

Summary

The implementation of technology in early childhood classrooms can be an effective resource for improving student engagement, motivation, and understanding; however, it also has limitations. The COVID-19 Pandemic forced immense change in classrooms worldwide, as educators had to adopt hybrid teaching practices, and opened education to a new era centered around technology implementation. As society continues to become more dependent on technology, educators become aware of the necessity of using digital tools in the classroom, as well as the need to teach students how to properly engage with these tools that they will use for the rest of their lives. If technology is implemented in the classroom at a developmentally appropriate manner and used in moderation, it can create a more welcoming environment for students who have been raised surrounded by digital technologies leading to more opportunities for all types of learners to demonstrate their understanding (Alam & Mohanty, 2023; Paul et al., 2023). Overuse of technology can negatively impact students' development, making it vital that educators are aware of best practices in implementing digital devices in their classrooms. Educators must be properly trained on how to use these new technological resources to implement these tools effectively into their instruction. Technology has become a vital part of instruction and it is integral for the future of education to adapt to a digitally native society, educating and preparing students for college and career readiness in the future.

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The Impact of Implementing technology in High School Visual Art Classrooms on Students' Artistic Development

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Abstract

In response to the COVID-19 Pandemic, the shift to online learning environments has introduced art education to the use of technology to foster and motivate students to learn. However, concerns have been raised around the ethics of using AI to develop students' artmaking skills, as most popular generative technologies are trained on open-source databases. Therefore, the purpose of this project is to investigate the impact of technology's integration into art education on the artistic development skills of secondary school learners. The research reviewed in this project found that technology can provide students with alternative learning environments, easy-to-assess feedback, and help generate ideas at the start of the art development process. It was also found that the open-endedness of generative technology has the potential to expose students to systemic bias and misinformation, while also increasing their overall reliance on software, thus hindering their physical creation skills. Considering the research results, practice implications include incorporating technology into the visual arts to enhance students' creative thinking skills while offering flexible feedback and unique learning opportunities. Additionally, policies at the state level should be put in place to prohibit the use of generative software trained on databases that are not approved by academic administrators. A clear understanding of what technology can and cannot be used in visual arts classrooms can help protect students and keep their learning environment safe.

Chapter 1: Introduction to the Project
Background

Due to the COVID-19 Pandemic, the integration of technology into education is significantly increasing and reimagining how traditional art classrooms are structured (T. K. F. Chiu, 2022). The development and incorporation of technology in education has led to the popularization of artificial intelligence (AI), which involves computers imitating cognitive functions such as learning and problem-solving that resemble the workings of the human mind (Poole et al., 1998, as cited in Chen et al., 2020). To continue to develop student learning and respond to changes in education, art education has "adopted technological approaches to create a foundation for enriching students' learning experience and [encourage] critical thinking" (Bedir Erişti & Freedman, 2024, para. 3).

In 2018, China announced the inclusion of AI curriculum planning into its educational system, which has led top-performing institution, Beijing Academy, to teach their high schoolers how to use AI to develop their artwork (T. K. F. Chiu & Chai, 2020; Monteith et al., 2022). The students were trained on Google's and Nvidia's AI art programs, where they utilized the technology to enhance their photography, painting, music, and writing skills (Monteith et al., 2022). Classrooms in the United States have seen an increase in students using AI chatbots as a supportive tool for developing their communication abilities, thanks to the technology's capacity for ongoing conversations (Moorhouse, et al., 2021, as cited in Chiu, 2024). For instance, students can ask AI questions related to their current class and receive answers in an easy-to-understand, conversational format. Students who experience low self-esteem while participating in classroom activities tend to feel more confident when working with AI, thereby improving their learning outcomes when used appropriately (Moorhouse, et al., 2021, as cited in Chiu, 2024). Interactive AI's ability to develop students' confidence when handling challenging coursework continues to set it apart from other educational technology tools.

The increase in the use of technology in society has impacted students' lives, which includes an increase in students who utilize interactive AI to enhance their problem-solving, communication, and self-directed learning skills (Huang, 2018, as cited in T. K. F. Chiu, 2024; RodrAguez et al., 2021). Education administrators have observed this phenomenon and actively encouraged technological integration to create a flexible learning environment that motivates students to learn (Almogren et al., 2024). Examples of this shift include digital imaging tools such as Photoshop and Blender functioning as artistic learning aids in visual art classrooms (Paul, 2008, as cited in Park, 2023). Educators have also begun using online platforms to host virtual art galleries for students to explore in augmented reality (AR), which offers "artistic experiences that cannot be obtained in traditional classrooms" (Fang & Jing, 2024, para. 11). The push for technology's inclusion in educators' curricula has transformed how students learn, and teachers instruct, prompting institutions to revise their plagiarism policies (Dwivedi et al., 2023, as cited in T. K. F. Chiu, 2024).

Statement of the Problem

Generative AI (GenAI) is a technological program that generates text, images, and videos (Kasneci et al., 2023, as cited in Heung & Chiu, 2025; T. K. F. Chiu, 2023). GenAI can enhance learning experience for teachers and students due to its ability to generate educational content, boost student engagement, and provide a personalized learning experience for all users (Kasneci et al., 2023, as cited in Heung & Chiu, 2025; T. K. F. Chiu, 2023). However, its growing popularity raises ethical concerns about whether the information and imagery generated by GenAI can be considered academically fair, as these programs rely on both open and private databases (Yan & Liu, 2024). Chat-

bots, developed initially as text-based communication programs in the early 2000s, experienced delays in their inclusion in education due to the consistent number of inaccurate responses that could mislead students (Yin et al., 2021, as cited in Heung & Chiu, 2025). For instance, ChatGPT is a large language model chatbot designed for human-like conversations that attempts to assist students by answering questions, however its responses could be riddled with machine bias, inaccuracies, and inappropriate feedback (T. K. F. Chiu, 2024; Yan & Liu, 2024). Subsequently, concerns have been raised regarding students developing an increased reliance on AI for academic work, which could lead them to compromise academic integrity (Dindorf et al., 2024, as cited in Heung & Chiu, 2025). The reliance on AI chatbots risks reducing students' critical thinking skills and potentially impeding their ability to connect deeply with the subject matter, raising concerns for teachers about integrating technology into their curriculum (Heung & Chiu, 2025).

Visual art education aims to nurture students' aesthetic sensibilities and vision by inspiring them to embark on an artistic journey that enhances their creative skills and processes (Liu et al., 2021). The art classroom promotes the development of students' physical abilities and brain function to foster imagination and creativity, enabling them to create original artistic compositions (Liu et al., 2021). With the introduction of AI technology into the visual arts, it becomes essential to question how it might affect creative thinking, as these programs are designed to mimic the human mind and, thus, can serve as substitutes for human imagination (Carceller, 2024; Poole et al., 1998, as cited in Chen et al., 2020). Several generative art programs, such as The Painting Fool, use data fed to them to generate art that is argued to be less imaginative than human-made artwork while eliminating the artistic development process of the artist (Leonard, 2021). Integrating technology into society has incited a growing dependence on artificial intelligence, which some fear may jeopardize students' capacity to cultivate their creative skills.

Purpose of the Project

This study aims to investigate the impact of integrating technology into the visual art curriculum on the artistic development skills of high school students. Due to the increasing accessibility of technology, it is crucial to examine how AI affects the development of students' art creation techniques. If a student becomes overly reliant on generative AI materials, their ability to connect with classroom content and enhance their critical thinking skills may be at risk (Al Shloul et al., 2024, as cited in Heung & Chiu, 2025). As the research is reviewed in the literature portion of this paper, three vital questions will be addressed. Firstly, has the modernization of technology, specifically with the integration of AI, limited students' artistic expression? Exploring how AI can support, and hinder, art students is crucial in comprehending how technology may shape the future of the visual arts curriculum. Secondly, in what ways has technology influenced the revisions of the art curriculum since the COVID-19 pandemic? The Pandemic has impacted over one billion

students, necessitating a transition to online classrooms due to school closures (T. K. F. Chiu, 2022). The urgent shift to digital classrooms has sparked a conversation about how art education can keep students motivated to create outside traditional means. Thirdly, how does technology integration impact student motivation in the art classroom? Motivation has been a consistent argument for why technology is a valuable learning tool for keeping students engaged in their education (Almeogren et al., 2024). Hence, exploring the relationship between technology and motivation serves as a critical endpoint for this study.

Theoretical Framework of the Project

The ARCS Model of Instructional Design, developed by Keller (1987), addresses the issue that many researchers identify as the primary justification for incorporating technology into visual art curricula: students' motivation to learn (Almogren et al., 2024; Liu et al., 2021; T. K. F. Chiu, 2021). The ARCS Model is "a method for improving the motivational appeal of instructional materials" to increase student engagement within educational programs" (Keller, 1984, as cited in Keller, 1987, p. 2). Traditionally, student motivation was perceived as unpredictable, placing the responsibility on students to ignite their desire to learn (Keller, 1987). However, previous studies on sustaining student motivation have revealed that even the most motivated learners can lose interest due to boredom stemming from poor-quality instruction provided by educators (Keller, 1987). Thus, Keller developed the ARCS Model of Instructional Design to assist educators in creating instruction that "would stimulate the motivation to learn" (Keller, 1987, p. 2).

The ARCS Model comprises four categories: Attention, Relevance, Confidence, and Satisfaction. Capturing and maintaining student attention is one of the most consistent factors that increase motivation to engage with new material. While attracting student attention is often seen as straightforward, sustaining that attention presents the true challenge (Keller, 1987). Students perceive the material as meaningful and aligned with their goals or future aspirations, which educators can leverage by connecting content to real-world applications, career opportunities, or students' current interests. Additionally, students' confidence is the third section of the model, as it can "influence a student's persistence and accomplishment" when engaging with educational material (Keller, 1987, p. 5). Several factors contribute to the different levels of confidence that students possess. For instance, confidence can vary among individuals based on their ability, effort, luck, and the difficulty of the task being taught (Dweck, 1986, as cited in Keller, 1987). The variability in confidence usually comes from how people interpret their past experiences and predict future results. Confidence can also be greatly impacted by the fear of failure when confronting a difficult task (Keller, 1987). Introducing challenges as a regular part of education can shape how students approach new assignments and interact with advanced material. The final category of the ARCS model is satisfaction. This category incorporates practices that "help people

feel good about their accomplishments" to motivate them to continue working (Keller, 1987, p. 6). Typically, a reward is contingent upon completing a task, which could result in a positive or negative reaction from the student, depending on how the educator manages the assignment (Keller, 1987). Keller's (1987) ARCS Model of Instructional Design will serve as the framework for this study, constructing connections between how AI's integration into art education could support student motivation to learn.

Definition of Key Terms

The definitions below provide clarification of the essential terms used for context of this study:

Artificial Intelligence (AI): "the capability of computer systems or algorithms to imitate intelligent human behavior" (Merriam-Webster, n.d.).

Augmented Reality (AR): "an enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device (such as a smartphone camera)" (Merriam-Webster, n.d.).

Generative AI (GenAI): "artificial intelligence that is capable of generating new content (such as images or text) in response to a submitted prompt (such as a query) by learning from a large reference database of examples" (Merriam-Webster, n.d.).

Secondary School: a school intermediate between elementary school and college and usually offering general, technical, vocational, or college-preparatory courses (Merriam-Webster, n.d.).

Summary

The COVID-19 Pandemic has prompted a re-evaluation of education, as technology has drastically altered how traditional education is delivered (T. K. F. Chiu, 2022). With the popularity of technology comes the increased use of AI, which can imitate cognitive functions that traditionally resided in human beings (Poole et al., 1998, as cited in Chen et al., 2020). Educational administrators have observed students' increased use of AI technology as tools to enhance their problem-solving, communication, and overall motivation to learn (Almongren et al., 2024; RodrAguez et al., 2021; Huang, 2018, as cited in T. K. F. Chiu, 2024). Art education is experiencing an increase in the use of technology in the classroom, as teachers have already begun to use supportive art development programs like Photoshop and Blender for 2D and 3D art creation (Paul, 2008, as cited in Park, 2023). Certain cases employ AR, allowing students to visit virtual art galleries since traditional art classrooms cannot provide the same experience (Fang & Jing, 2024). Technology has provided students with experiences that are not traditionally available. Still, the presence of GenAI has raised concerns regarding how reliant students might become on it (Dindorf et al., 2024, as cited in Heung & Chiu, 2025).

Visual art education aims to develop students' aesthetic vision by motivating them to embark on a creative journey that enhances their artistic skills

and techniques (Liu et al., 2021). GenAI has the potential to disrupt the development of students' physical abilities, serving as a substitute for human imagination, which initially enabled students to nurture their creativity and produce original pieces of art (Carceller, 2024; Poole et al., 1998, as cited in Chen et al., 2020; Liu et al., 2021). Thus, this study analyzes the impact of technology integration into the visual art curriculum on secondary school students' artistic development and skills. Keller's (1987) ARCS Model of Instructional Design will act as the main framework for this research, as the development of students' motivation to learn has been a recurring reason for why technology should be incorporated into art education (Almogren et al., 2024; T. K. F. Chiu, 2021; Liu et al., 2021; Keller, 1987). Chapter Two of this study presents a literature review to address the three research questions outlined in the project's purpose. Chapter Three discusses the research findings and provides conclusions from the study of the literature.

Chapter 2: Review of Related Literature
Introduction

The inclusion of technology in education has incited a growing dependence on AI, putting students' ability to develop their artistic skills in jeopardy. Visual art is an essential part of secondary school education, as it cultivates students' physical coordination and brain function, which play vital roles in the development of their observational, imaginative, and creative capabilities (Liu et al., 2021). When students use art utensils, their physical movements are incorporated into the design process, resulting in unique, original artwork. Students' brain conductivity is also stimulated, establishing the growth of imagination and creativity skills as they self-develop work. The improvement of these cognitive functions is critical for students to experience success after secondary school education and ensure the continued development of these skills (Leonard, 2021; Liu et al., 2021). Providing art students with an engaging learning experience can support their application of artistic techniques and the development of creative thinking skills after secondary school education.

Art education is an ever-changing educational domain. Digital technology used as an artistic development tool in art education has been discussed since the 1960s, and the implementation of photography and cinema in visual art curricula have already redefined what is considered a teachable creative medium (Carceller, 2024; Patton & Buffington, 2016, as cited in Park, 2023). Thus, the purpose of this study is to explore the influence of technology's integration into the visual art curriculum on the artistic development of high school students. Over the past 50 years, new media have impacted art education, leading to new artistic courses such as video and graphic art development (Knochel, 2023). As technology broadly improves, potential avenues for artistic application have been realized, providing students with new and unique creative opportunities to explore. Artificial Intelligence (AI) is one of these new avenues of exploration. Its mainstream usage began in 2022, and

it is expected to increase by 49.15% between 2021 and 2026 (Ringvold et al., 2024; Technavio, 2022, as cited in Park, 2023). Therefore, it has been crucial to consider the impact of incorporating such technology into visual art education on the development of skills in secondary school students. This chapter will begin with an exploration of whether technology has affected students' artistic expression. The next section will address the changes made to the visual arts curriculum in response to the Pandemic. To conclude the chapter, an analysis of technology's impact on students' motivation will be presented.

Technology's Impact on Artistic Expression

The innovation of technology, at the core of societal progression, has influenced the way that students learn. Chatbots like ChatGPT, Midjourney, and Copilot have become increasingly accessible as online platforms and mobile applications. Thus, students' utilization of generative technologies has grown as they have sought alternative means of communication and methods for gathering information (Borger et al., 2023, as cited in Almogren, 2024; Bedir Erişti & Freedman, 2024). The art education community has noted the rise in technology use among students and the potential of supportive technologies to cultivate their creative development skills.

Generative AI (GenAI) is an image construction tool that some educators and administrators are looking to incorporate into art education. GenAI utilizes a text-to-image model to generate realistic images from users' written prompts within minutes (Rombach et al., 2022, as cited in Wang & Xiao, 2024). With the technology's ability to generate images, the traditional development process that students typically learn is bypassed, as AI handles the creation for them. As GenAI has increasingly become a topic of discussion in art-centered spaces, it has been crucial to explore how technology is currently being utilized to enhance students' artistic development.

Technology in Visual Art Classrooms

The implementation of technology in visual art classrooms has varied based on the curriculum being taught. Photography, for example, employed digital cameras for capturing photos and utilized post-production editing software for creating collages, reimagining, and compositing images in programs like Photoshop (Knochel, 2023). Digital cameras have served as powerful artistic tools for photographers, as their various settings provide users with a wealth of freedom to personalize their work. The educator teaches students how to properly set up digital cameras, thereby building their confidence in capturing photos. During post-production, students are taught how to use editing software to enhance their images. Although there are free, open-source alternatives, Photoshop has been commonly used in photo courses because it has been regarded as the industry standard for photo manipulation has been considered rich in accessible instructional tutorials (Knochel, 2023). Photography's inclusion in art education has paved the way for new and increasingly advanced supportive art technologies to be integrated into the curriculum.

Additionally, virtual reality (VR) has recently been introduced to

art-centered spaces as a new tool for nurturing creativity. VR uses 360-degree cameras to capture videos and photographs in a spherical format, allowing viewers to observe from the center (Kwon & Morrill, 2022). A camera is set up to capture 360-degree images of a non-virtual environment, which are then transformed into a virtual space for viewers to interact with. Kwon and Morrill (2022) explained that Morrill (an art education teacher) employed 360-degree virtual tours with the help of free and easily accessible software to allow his students to experience various artistic environments from around the world. Morrill (2022) further noted that virtual tours can enhance students' understanding of artists' work by allowing them to experience the pieces in their original, contextualized spaces. Bringing art to students through VR has offered a unique learning experience that has provided positive engagement with artwork. The recreated environments could vary based on what the teacher intended for their students to experience during the virtual tour, giving the teacher control over what was examined. While VR emphasized the viewing experience for students, there exists an alternative technology to support a more interactive virtual space.

Alongside VR, augmented reality (AR) has also entered conversation as a supportive learning tool in visual art classes. AR can create an interactive virtual space using text, images, and 3D objects as virtual elements (Panciroli et al., 2017, as cited in Kwon & Morrill, 2022). While VR has presented students with a digital environment, AR has enabled them to interact within it, typically by moving around and/or engaging with specific objects. AR promotes students' engagement with their learning and encourages motivation to interact with art by capturing and sustaining their attention using technological support (Keller, 1987). Furthermore, Kwon and Morrill (2022) recalled Kwon incorporating Blippar, a form of AR technology, into a project where each student researched an animal at risk of extinction and painted a portrait of said animal using the website. The AR program Blippar assisted the students with their artmaking by providing an alternative means to paint, exploring other less traditional techniques in the process. Therefore, expanding skills and introducing new art mediums to students of all skill levels can contribute to students' artistic growth.

How Does AI Influence Artistic Expression?

Interest in incorporating AI into the art education curriculum has emerged in recent years, driven by the rapid development of interactive technology. The appeal of AI to the public has significantly increased, despite a lack of knowledge surrounding how AI technology works (Samuel et al., 2023). Since AI is a newer technology, certain individuals often overlook the unfamiliarity with the software, focusing instead on its versatility. This shift in technological focus underscores the differences between conventional art instruction and emerging digital tools.

When students took visual art classes, they learned how to use their physical abilities and creative thinking skills to create original pieces of art-

work. Whether in a traditional classroom or a digital space, the creator of the artwork needed to be proficient in using artistic tools and have experience utilizing their imagination to produce art (Lyn et al., 2022). Skills such as painting, drawing, graphic creation, and photography were among the artistic abilities developed in art education classrooms, which required both physical and cognitive growth (Liu et al., 2021) Visual art classrooms utilized supportive technology as a tool that teachers implemented to engage with students' core functions. In contrast, AI approached the art creation process differently, illuminating the potential technology had in fostering artistic development.

AI's multifunctionality has provided users with a variety of tools to assist in creating artwork. For example, Ringvold et al. (2024) proposed that GenAI can be used to help students expand the boundaries of their imagination while simplifying the creative process by utilizing text-to-image generation as a tool for visualization and co-creation. The use of a text prompt has given students the control needed to direct the AI. The prompts can vary from a few words to several sentences, highlighting the importance of students' writing and critical thinking skills in guiding the AI during the development process. However, Ringvold et al. (2024) noted that regardless of how the prompt is phrased, the AI may not produce what the author intended because of the inherent limitations of the technology. GenAI has been trained by feeding it art, photography, and other visual media to utilize during the generation process. Depending on the AI, the data used to train large model technology can come from publicly available internet sources or small, private datasets (Yan & Liu, 2024). The diversity of these databases has impacted the output created by the AI, with a larger amount of training data leading to more unique outcomes. Consequently, students' artistic expression has been enhanced with the aid of GenAI by offering them ideas to reference during their creative process. The AI also streamlines development, which has allowed students to focus on their creativity and critical thinking skills while collaborating with the AI to produce the image of their choice.

The distinctiveness of GenAI has brought a new perspective on creating artwork within traditional art mediums. Lyu et al. (2022) examined oil paintings developed with AI by artists, and non-artists, with participants required participants to reflect on their experience through a questionnaire. Text-to-image generation levels the playing field for modern art conception as it allows anyone, regardless of skill, to create artwork. With the assistance of AI, students who consider themselves non-artists could feel confident in creating artwork that reflects a high level of skill. Instilling confidence in students in the visual art classroom can encourage students to engage with the curriculum, as it helps learners understand that success is possible with effort (Keller, 1987). AI, through generation, has eliminated the need for creative development and has helped students create masterful levels of artwork. The non-artists in Lyu et al.'s (2022) research expressed satisfaction with GenAI, as it helped bring their imagination to life to a visual concept. Non-artists can

develop their artistic expression with the assistance of GenAI, utilizing the prompt feature to transform their ideas into visual representations. There is potential for AI to aid in developing students' confidence by manufacturing opportunities for students to create artwork that reflects advanced proficiency.

For students who are practicing artists, the inclusion of AI in art education may affect their artistic expression differently from those who are not. Since practicing artists spend time cultivating their skills to craft original pieces of artwork, using GenAI might conversely limit their natural means of expression. The artist who participated in research conducted by Lyu et al. (2022) shared that the randomness and variation of GenAI made them lose confidence in their ability to use technology as an art utensil. The author only has control over what the AI could add to the image, while the AI has control over the production of the final image. Thus, individuals in the study who are practicing artists experienced a loss in confidence in their artistic expression if the AI generates their prompt incorrectly (also known as misgeneration). Vartiainen et al. (2023) conducted research involving the impact of co-creating digital art using AI on the development of K-9 students. When a teacher involved in the research program asked a student, who is a practicing painter, if the painting they generated belonged to them, the student answered "no," and that they "didn't make that picture" (Vartianinen et al., 2023, p. 417). For this student, who created art in a traditional sense, GenAI hindered their ability to express themselves, thus removing a natural sense of ownership over the artwork. Limiting students' artistic expression could negatively impact their confidence and motivation to learn, as involvement in the activity aids in the growth of their ability to create (Keller 1987). The conversation around technology's impact on artistic development is a critical one to have.

Can Technology be Implemented for the Purpose of Artistic Skill Development?

With the level of support technology can provide, its potential as a tool for helping students develop their artistic skills has been evident. AI has been recognized for introducing new perspectives on traditional art creation, broadening how art is made and what level of skill is necessary for composing masterful pieces. Duester (2024) assessed how practicing artists in China used AI to support their artistic development. The participants reported that they incorporated AI into their creative routines to complete artwork more quickly, generate ideas for use during the creation process, and enhance their cognitive and creative abilities (Duester, 2024). AI ability to streamline the artistic development process for students by participating in creation alongside them, giving them experience in connecting their creative thinking outcomes to high-quality artwork. Supportive artistic technology can also be utilized to assist students in creating visuals before producing original pieces of artwork. GenAI can generate written ideas or provide image examples of the prompt for the student to reference and incorporate into their work. Thus, the prop-

er and ethical implementation of technology can aid students in visualizing what they wish to create and serve as a guide throughout their development process. Nevertheless, GenAI raises concerns about how AI affects students' physical ability to create art.

Generative technology could eliminate the need for developing physical creation skills in art education classes if AI is implemented for art creation purposes. In a study conducted by Ringvold et al. (2024), it was found that AI technology replaced sensorimotor functions in art development, resulting in students missing out on enhancing their visual art abilities. Students are typically engaged in tasks like painting, drawing, and photo editing, but with the support of GenAI, technology handled the artmaking for them. If the AI is generating content for students, educators will need to re-evaluate how they measure students' growth in creative abilities (Vartiainen & Tedre, 2023). Traditional visual art classrooms determine if students are meeting their learning goals through the work they produce. With the aid of AI, educators must determine whether students are truly learning or improving their cognitive skills through artwork produced by a machine. Along with assessment, using support technology raises questions about how copyright and user ethics will be taught to students engaging with generative media. Therefore, revising the art education curriculum can help educators successfully incorporate modern technology into art classrooms.

Revisions to the Art Curriculum in Response to the COVID-19 Pandemic

The COVID-19 Pandemic has impacted art education curricula due to the shift to virtual classrooms and the need for supportive learning technology. Art educators faced the challenge of developing students' physical and mental artistic skills in a virtual space while managing practices and procedures and providing students access to materials (Sabo, 2022). The transition to a virtual setting required art educators to modify their curriculum to be both teachable and accessible from a distance. Educators needed to become familiar with supportive technology, such as Zoom, to communicate with students in a way that mirrored traditional lecture practices. This shift also raised concerns about whether students had consistent access to digital technology to retrieve and complete their assignments. Complications arose regarding whether students maintained a reliable Wi-Fi connection, creating additional challenges for teachers to address.

In essence, the transition to a virtual classroom has led art educators to rely on technology as a supportive learning tool during instruction. The Pandemic has normalized the use of technology in visual art classrooms, promoting the adoption of AI in the curriculum to support flexibility for both teachers and students (Duster, 2024; Kara, 2021). Digital tools used to reinforce skill development before the Pandemic have continued to be utilized, taking advantage of the adaptability of interactive technology and AI. Technology has provided students with a versatile learning experience, help-

ing to maintain their engagement with the curriculum and motivation to learn (Keller, 1987). Therefore, exploring how flexible learning environments are shaped in art education classrooms could provide context in how technology is utilized in artistic spaces.

Flexible Learning Environments

Teachers who wanted to create a versatile learning space continued their efforts during the migration to digital classrooms. The shift to an online learning platform offered students the chance to navigate a digital space, where they encountered interactive, AI-enabled, personalized learning experiences (Bedir Erişti & Freedman, 2024; T. K. F. Chiu, 2024). Interactive learning tools like Midjourney assisted students in finding information or creating an image almost immediately after the prompt is sent. Moreover, students who need extra support in the classroom can benefit from technology's ability to provide nearly instantaneous assistance in a conversational and customizable format. Incorporated technological trends for feedback significantly contributed to students' artistic development and helped maintain the curriculum's relevance (Bedir Erişti & Freedman, 2024; Keller, 1987). Feedback on artwork plays a crucial role in developing artistic skills. The United States' inclusion of Google for Education and Microsoft K-12 Education Transformation Frameworks has made providing feedback through digital spaces like Google Classroom accessible and easy to use for students and teachers alike (Southworth et al., 2023). Teachers can add direct notes onto images of students' work, eliminating the need to inscribe comments directly on the piece itself. The ongoing use of technology to assist students' learning can transform how students perceive and utilize digital software for their art-making.

Students' relationships with technology impacted their confidence in engaging with the curriculum. A research study conducted by T. K. F. Chiu (2021) reported that students exhibited a significant increase in their sense of autonomy, competence, and relatedness following the receipt of digital support. Direct support from technology possesses the capability to help students feel empowered while learning, as supportive tools assist in guiding their instruction. Technology's enhanced flexibility when involved in students' learning is reflected by its ability to provide learners with instant access to information. Instructional feedback has also become more accessible on a variety of devices, thanks to digital platforms like Google Classroom. The curation of adjustable learning within art education, facilitated by technology, has introduced new strategies to enhance students' learning.

Will Incorporating Technological Support Programs Foster Student Learning?

Given the level of familiarity students have with technology, the potential of digital software to enhance students' learning has become clear. Miralay (2024) conducted a research study that used both qualitative and quantitative methods to evaluate students' and teachers' opinions on the use of AI and AR in developing art skills. Teachers supported the use of AI and AR

tools to foster creativity, as technology made the course more accessible and assisted learners who were struggling in the production stage (Miralay, 2024). The universality of technology introduced a level of comfort in art courses, helping students who were less familiar with art become more engaged. AI's ability to provide students with quick solutions for challenges or relevant resources for studying kept them motivated to learn and create. Applications of AR were equally advantageous, allowing students to experience art creation from a virtual standpoint. AR was positively received in Miralay's (2024) study by students, with the most resonant statement among learners being "I see design elements live" (p. 49). Students have shown an optimistic response to using AR in their creative process. AR enabled students to view their design process from a new perspective, thereby fostering imagination.

Although incorporating technology into education has been shown to bolster students' design skills, concerns about increased reliance on AI have emerged. Technology's ability to significantly shorten development time raised questions about whether students will become overly dependent on digital tools, potentially hindering their artistic growth with frequent use (Heung & Chiu, 2025; Miralary, 2024; Samuel et al., 2023). Technology that supports generative content can eliminate the necessity for traditional art skills, as AI has progressed to a level where it can generate artwork for students. While digital programs can be used to enhance creative thinking skills, the development of physical skills is not as well supported in digital environments.

Advantages and Limitations of AI in Visual Art Classrooms

The integration of AI technology into visual art education has presented both strengths and weaknesses for student learning. To illustrate, AI has been shown to have strong capabilities in providing students and educators with personalized learning experiences within the arts (Azzam & Charles, 2024). AI has been guided by the students regarding what support they need, allowing them to shape their learning experience and environment. GenAI like Midjourney has provided lifelike images for students to reference during their creative process. ChatGPT has responded to prompts in a conversational format based on questions or scenarios that student's input. The versatility of AI offered students a new perspective through which to view their processes. In addition to providing personalized learning experiences, AI has lightened the workload of art educators.

Educators are expected to balance a multitude of responsibilities while providing their students with an adequate learning experience. Thus, teachers who have integrated AI into their curriculum have noted a decrease in preparation time, as generative technology supports the development and execution of art teachers' curricula (Azzam & Charles, 2024; T. K. F. Chiu & Chai, 2020). The research indicated that teachers with a strong understanding of AI have utilized generative features to create engaging lessons or inspire ideas. AI tools that check for plagiarism (Turnitin) have been included in multiple educators' curricula, allowing them to verify the authenticity of students'

writing assignments. Overall, AI software has shown the ability to enhance students' learning in a personalized environment and to assist educators in teaching by reducing their workload. The creation of a more fluid work environment has motivated students to learn and encouraged them to engage with advanced technologies to produce artwork that reflects mastery (Keller, 1987). While the benefits of incorporating AI into art education are explored, it is crucial to examine the challenges that arise when integrating generative AI into art-centered spaces.

GenAI has offered students a new perspective, but several lingering concerns must be addressed before its full implementation. Given that AI is trained on internet resources, issues related to bias have come to the forefront. AI biases had become prevalent generative media or written responses since much of the content used to train AI comes from open-source online sources (Azzam & Charles, 2024; Park, 2023; Yan & Liu, 2024). The training data for AI has been determined by the software creator, leaving teachers and administrators with little control over what the generator will produce. Depictions of bias towards race, gender, and culture can negatively impact students' learning experiences and cause discomfort when engaging with AI. Research has shown that portrayals of gender bias can increase anxiety in students and adversely affect their mental health (Azzam & Charles, 2024; Park, 2023; Weng & Xiao, 2025). Students' ability to comfortably co-create with generative technology is important to establish and protect. Due to the lack of control authors have over the development process of GenAI, there is uncertainty regarding whether the AI will generate appropriate artwork.

Additionally, AI's capacity to produce art can lead students to rely on software to complete their work. Overreliance may hinder the development of physical artistic skills, as artistic ability is traditionally cultivated over a long period (Alasgarova & Rzayev, 2024; Azzam & Charles, 2024; Bedir Erişti & Freedman, 2024). Creating art involves consistent practice and learning how to apply techniques to achieve visual outcomes (drawing, painting, etc.). Given how quickly AI can generate realistic art, the allure of using it as a creative tool can be particularly tempting for students who want masterful artwork.

AI's ability to provide students with personalized learning experiences and assist in their art has offered a unique art-making experience. Flexibility in students' work environment has been shown to enhance motivation to develop their art and explore techniques as potential tools for creation. Conversely, increased use of generative technology may cause students to depend on the software rather than their own physical art skills. With the benefits and drawbacks of AI, research has cited it as a valuable resource for supporting students' motivation in educational spaces (Alasgarova & Rzayev, 2024). Therefore, an overview of how motivation impacts visual art students has been essential.

Technology and Students' Motivation to Create Art

To develop a deep understanding of art creation, students must be

motivated to learn proper techniques for visual art development. Art education depends on student engagement with lessons to accurately assess and foster students' ability to produce art. Subsequently, art educators have been increasingly incorporating technology in modern art curricula to motivate students, enhancing their self-efficacy and learning achievements with technology (Alasgarova & Rzayev, 2024; M. C. Chiu et al., 2024). The adaptability of technological advancements has offered students innovative avenues for artistic planning and creation, potentially boosting their engagement and motivation in the classroom. As research expands technology's influence on motivation, it has become crucial to investigate how motivation affects students' willingness to participate in visual art learning environments.

Student Motivation in Art Classrooms

Through a supportive and engaging curriculum, art education has driven students' motivation to create by utilizing industry-standard techniques taught through explicit instruction. According to Gbadegbe et al. (2024), students who see themselves pursuing media creation as a hobby or future career tend to experience increased motivation in the classroom because the medium being taught aligns with their interests. When the content was relevant to the learner, they were more likely to engage in the classroom environment. Educators who relate their curriculum to students' interests while providing a purpose for learning creative development skills can establish new reasons for learners to engage with their education. In a research study conducted by Gbadegbe et al. (2024), it was revealed that a maintained and robust ecosystem has a positive influence on students' motivation to work in visual art classrooms. In simple terms, environments that emphasized positive teaching practices, along with supportive tools accessible to all students, enhanced students' motivation to learn and work within that space. A curriculum that captured students' attention and connected instruction to relevant skill-building techniques involved investing in better tools, establishing a collaborative workspace, and offering students versatile support options (Gbadegbe et al., 2024; Keller, 1987). Visual art classrooms can enhance student learning by offering access to interactive workspaces and supportive resources that enable all learners to engage effectively. As technology continues to support students' artistic development, the emergence of AI has raised questions about whether generative software affects students' willingness to engage with the arts.

Does AI Motivate Students to Develop Art?

Given the level of familiarity many students have with AI, using interactive technology has helped cultivate their motivation. Fang and Jiang (2024) proposed, based on their research, that employing real-time feedback with technological support encouraged students to be bolder and more inventive in their artistic endeavors. Visual art education promoted students to step outside their comfort zones and expand their creative boundaries with teacher guidance. AI assisted educators in providing rapid feedback on students' work, motivating them to tackle new challenges. In this study, students inter-

acted with the software through an interface, adjusting parameters within the technology and reviewing proposed new ideas (Fang & Jiang, 2024). The versatility of AI has offered students various options for how they approach their learning. Easily assessed and utilized choices have been shown to motivate students to explore alternative approaches in their art development process with the support of the teacher and technology.

Interactive AI has emphasized the development of artistic skills and has been used by art educators to inspire students to enhance their art creation abilities. A study conducted by M. C. Chiu et al. (2022) examined how AI can boost motivation through interactive feedback using a deep learning-based art learning system (DL-ALS). AI programmed to assist in developing students' art skills offered unique options for students to choose when and how to utilize them. The DL-ALS system also encouraged students to consistently practice their physical skills to achieve learning outcomes while simultaneously increasing their motivation (M. C. Chiu et al., 2024). The feedback provided by the DL-ALS system has been designed to give learners a clear and easy-to-understand guide to improving their art creation skills. The motivation fostered by interactive AI stems from students' self-directed learning, providing them with a distinctive learning experience.

Technology as a Means of Motivation for Visual Art Students.

A critical examination of the variables involved in implementing technology to promote students' motivation can inform future educators' decisions about incorporating technology into their course structure. In a study pioneered by Alasgarova and Rzayev (2024), high school students were interviewed on their opinions of AI employed to motivate them to complete their assignments. The students were assigned work where AI was used to assist in answering questions and problem solving. Students found that they felt a level of over-reliance on AI for their critical thinking task, which shifted their motivation to an extrinsic form (Alasgarova & Rzayev, 2024). Students who were partaking in classroom activities with technology assistance experienced increased reliance that could negatively impact their motivation to learn on their own. Dissatisfaction with the results of a student's work caused demotivation to continue to work, as there is an apparent lack of control within their creation process (Keller 1987; Lyn et al., 2022). Demotivation through a loss of control within has been a realistic consequence of AI becoming too involved with student learning. Despite this, the study also indicated that AI's proficiency in explaining questions and image generation capabilities enhanced students' comprehension and critical thinking skills (Alasgarova & Rzayev, 2024). Technology motivated students by providing them with relevant information to reference during their learning process. How the information was displayed had been customized upon student request, providing control over their learning experience.

Summary

The integration of technology into art education has prompted significant inquiries regarding the influence of generative technology on students' artistic development. Over several decades, digital technology has substantially transformed the creative landscape, presenting a novel perspective on art within the educational domain. Although technology has been a staple in art education through the incorporation of photography and digital art, its application in other, more traditional media experienced a considerable increase during the COVID-19 Pandemic of 2020. The transition to online classrooms compelled educators to integrate new technology into their lesson planning, thereby enabling them to continue providing practical support to their students remotely. Through the application of prompts, generative technology (such as ChatGPT, Midjourney, and Copilot, as references) has function as an alternative methodology for artistic development, utilizing open-source databases to generate lifelike and masterful artwork. Generative AI also has been employed for brainstorming purposes, as the software creates human-like responses that foster creativity and critical thinking skills. The versatility of technology has provided students with various forms of support, offering them flexible and personalized learning opportunities.

Nevertheless, concerns have arisen regarding the potential for students to become overly dependent on technology for furthering their artistic development. Researchers have observed that AI's capability to eliminate the necessity for students to employ physical development skills during the creative process raises concerns, as the cultivation of both physical and cognitive skills is essential in art education. Additionally, issues surrounding the management of bias have continued to linger, as the incorporation of open-source databases into generative technology suggests it may be trained to produce media from any source. Generative media that reflects bias has been shown to adversely affect students' experiences with technology, heightening anxiety and diminishing their willingness to engage in artistic creation.

Given that motivation is one of the established reasons for incorporating technology into visual art curricula, researchers have emphasized the importance of including technology as a tool to inspire students to connect with the course. AI is a relatively new technology that has provided students with unique learning experiences, encouraging them to learn more with its support. However, concerns remain regarding whether the flexibility of AI will hinder students during their art creation, with the risk of students becoming over reliant and demotivated to learn independently. Before full implementation into art education, and as technology continues to progress, gaps in the research will need to be addressed. Chapter 3 addresses the research gaps and implications for this study.

Chapter 3: Implications
Introduction

Art education has adopted a modern approach to instruction by integrating technology into the development of students' visual art skills, intending to enhance motivation and critical thinking abilities. In the previous chapter, literature was reviewed through the lens of the three research questions presented in Chapter One. Firstly, has the modernization of technology, particularly the integration of artificial intelligence (AI), limited students' artistic expression? As students become increasingly familiar with technology, it is crucial to consider whether AI may restrict how they express themselves through the art they create. Secondly, in what ways has technology influenced the revisions of the art curriculum since the COVID-19 Pandemic? The transition to an online classroom presented challenges for art educators, as traditional art is typically taught in person. Technology was utilized to engage students in their new digital environment, with several software programs now included in standard classrooms. Thirdly, what is the effect of technology integration on student motivation in the art classroom? Motivation is essential in artistic classrooms, with research indicating that technology could help sustain students' engagement in creating art. All three questions contributed to the investigation of this project's purpose and problem statement, utilizing literature to analyze if technology influenced how students engaged with visual arts.

The research questions clarified the purpose of this project: to examine how integrating technology into the visual art curriculum impacts high school students' artistic development skills. Based on this, the problem addressed in this project concerns students becoming overly dependent on technology, which could jeopardize their ability to develop their art creation skills. Administrators and educators who wish to modernize their curriculum need to understand the advantages and disadvantages of integrating new, complex software into their lesson planning; especially as technology continues to become increasingly accessible to adolescents. Therefore, Chapter Three will focus on what conclusions were made based on the research examined in the previous chapter, along with potential practice and policy implications. The chapter will conclude with recommendations for future studies and limitations experienced while finalizing this project.

Conclusions

The benefits and challenges of integrating technology into visual art classrooms were examined through relevant research. Scholars have found that AI can boost students' motivation in school and provide them with ideas and references during their art development process (Duester, 2024; Fang & Jiang, 2024; Lyn et al., 2022). Generative AI (GenAI), for instance, can create images from text prompts, helping users turn their imagination into visual forms. The images that generative technology can produce range from realistic depictions of famous environments to cartoon characters. The wide variety of GenAI can support students who are still developing their artistic skills by offering

an alternative way to create artwork, thereby promoting an inclusive learning environment (Lyu et al., 2022). Engaging with GenAI can be presented as an optional part of the lesson, giving students a chance to have some autonomy over their learning experience. Providing new ways for students to explore art is essential for motivating them to engage with the subject (Keller, 1987). As software continues to evolve, technology can offer students novel educational experiences.

With the use of augmented reality (AR) and virtual reality (VR), students can explore new ways to create and interact with art. Technology offers students the opportunity to share experiences often not possible in a traditional classroom; for example, using VR to visit well-known museums to view art in a professional setting (Kwon & Morrill, 2022). Seeing art in its intended environment gives students a real-world example of how their work can be effectively displayed. AR programs, such as Blippar, introduced students to new painting options, involving their physical art skills to produce work in a digital space (Kwon & Morrill, 2022). Even in a virtual space, students still use their artistic development skills to create work in an interactive environment. Therefore, the two programs collaborate to offer a new learning experience for students while maintaining a relevant curriculum (Keller, 1987). Depending on how technology is used in visual art classes, art can be taught through an applicable lens, highlighting both cognitive and physical skills.

Concerns about whether technology, especially AI, can help develop students' physical art skills are the focus of this research. Studies have shown that GenAI provided students with little or no support in building their physical art skills (Alasgarova & Rzayev, 2024; Azzam & Charles, 2024; Bedir Erişti & Freedman, 2024). If students rely too much on AI to create their work, they might start depending on the program to handle the physical aspects of artmaking. While technology can assist in aiding students' artistic efforts, educators need to thoughtfully integrate it into their curriculum to prevent it from negatively impacting students' ability to learn and/or create. Therefore, the implications for practice and policy should be considered before officially including GenAI in the arts.

Practice Implications

Careful integration of technology in visual art classrooms can provide students with new sources of inspiration. The research suggests that incorporating generative technology into art education can improve students' creative thinking skills and support their brainstorming process (Lyn et al., 2022; Ringvold et al., 2024). As a learning tool, GenAI offers a new approach for students to take when creating artwork. If the generative tool is trained on appropriate and relevant data, students could benefit from referencing an accurate depiction of what they want to recreate. As students use technology, teachers can also find value in using electronics to improve their students' learning experiences. The literature suggests that art educators can incorporate technology into their curriculum to give students flexible feedback and

learning opportunities (Bedir Erişti & Freedman, 2024; Fang & Jiang, 2024; M. C. Chiu et al., 2024). Providing relevant and precise feedback to students through technology can help keep the visual art curriculum current while directly enhancing learners' creative art skills. The adoption of AR and VR can also provide students with new, customizable learning environments for viewing or creating artwork. However, as technology advances, policies designed to protect students from AI bias and misinformation are essential to maintaining a proper educational environment.

Policy Implications

A range of policies can be adopted to ensure that technology in visual art classrooms promotes student learning while maintaining a safe educational environment. To begin, AI bias in generative programs, which are trained on open-source databases, remains a key issue when discussing the implementation of technology in visual art settings (Azzam & Charles, 2024; Park, 2023; Yan & Liu, 2024). The use of popular GenAI programs, such as ChatGPT and Midjourney, increases the risk of exposing students to negative images of social and cultural identifiers. Therefore, to minimize the potential harmful impact on students' learning experiences, it is highly advisable to pass a state-level law that addresses ethical concerns related to AI. This law would prohibit the inclusion of AI software in educational curricula if the programs were trained on databases not approved by the academic administration. Such legislation can address the unpredictable nature of GenAI, as the prompt author had little to no control over how the software interpreted their written prompt (Lyu et al., 2022). Consequently, school administrators who review and approve AI technology before full integration can help limit students' exposure to potentially offensive content.

Along with establishing state laws, schools can benefit from creating a policy that clearly defines what technology can be used in visual art as a supportive learning tool. Research conducted by Kwon and Morrill (2022) found that students revealed significant improvement in their motivation to engage with art using modern technologies like VR and AR. Therefore, implementing modern programs and advanced software can support students in areas where traditional art classrooms fall short. The use of AR and VR in visual art classrooms is notably different from AI; hencefore, schools need policies to determine which technologies should be incorporated into art classes. Technology used in visual arts should continue to help develop students' physical and cognitive art skills, while also allowing their creative expression to flourish.

Directions for Future Study

For future research, it is strongly recommended to focus on secondary visual art classrooms, especially in the United States. The scholarly studies discussed in Chapter Two conducted their research in higher education settings or primary schools in other countries. Several studies have highlighted the lack of research in K-12 visual art classrooms and call for more investigations, since K-12 schools tend to have more complex dynamics than higher

education (Leonard, 2021; T. K. F. Chiu & Chai, 2020; Vartiainen & Tedre, 2023). The research should continue measuring the impact of technology on students' cognitive and physical creation skills, highlighting the opportunities and challenges that remain due to technology's role in the arts. With the United States' push to include technology-based educational frameworks in K-12 education, research conducted within the country is essential to ensure that interactive software will be a beneficial learning tool for young artists (Southworth et al., 2023). Thus, as technology advances, research should be carried out before full classroom implementation.

Moreover, before permitting AI use in classrooms, administrators should create policies that safeguard students from AI misuse. Generative media created by AI can expose students to bias, increase their exposure to misinformation, or cause them to become overly dependent on technology. Because many popular AI programs are trained on open-source databases, it is especially easy for students to come across misinformation and bias that can mislead them in their art development. (Azzam & Charles, 2024; Chiu, T. K. F., 2024; Park, 2023; Weng & Xiao, 2025; Yan & Liu, 2024). Therefore, policies should be put in place to address these issues and ensure AI remains a supportive learning tool rather than as the main source for information or artwork creation.

As a final point, a major limitation of this study is that most of the literature reviewed comes from research conducted outside the United States. Technology is increasingly common in American education, driven by the recent recognition of AI's versatility, which influences how traditional art is taught (Kwon & Morrill, 2022; Southworth et al., 2023; Vartiainen & Tedre, 2023). Most research has been done outside the United States, so a crucial review of how AI will affect American classrooms will be vital for shaping future laws and policies.

Summary

The goal of this project was to examine how integrating technology into the visual arts curriculum influences the artistic growth of secondary school students. Since the COVID-19 Pandemic, technology has become more advanced and accessible, enabling teachers and administrators to incorporate more modern tools into the art curriculum to help support and motivate students. However, questions about whether technology's impact on students' creative development skills is beneficial or has potential drawbacks have come to light. Specifically, the general prevalence of technology has consequently raised reliance on artificial intelligence, which could threaten students' ability to develop their creative skills.

Research indicates that technology in the arts can provide students with new learning experiences not typically found in traditional visual art classrooms. Using AR and VR enables students to view and interact with art within their professional environment, all without leaving the classroom. GenAI can support students in brainstorming by translating their ideas into visual for-

mats. Teachers also benefit from technology as a tool to give feedback on assignments on platforms like Google Classroom. Besides serving as a feedback method, technology can also create a digital space for alternative lesson delivery. Conversely, when it comes to developing students' physical art creation skills, advanced technology like AI offers little to no support. Students might start relying on AI to generate their artwork, which contradicts the purpose of visual art classes.

Additionally, concerns exist about the potential for misinformation and bias that students may encounter when using GenAI. To address these concerns, school policies and state laws should be implemented to protect students from potentially harmful information. With proper implementation of policies and government regulations, technology has the potential to help students elevate their art skills to new heights. Therefore, including technology in art education offers numerous benefits and challenges that all stakeholders should consider.

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The Impact of Digital Literacy on High school Students' Sense of Cyber Self-Efficay

David Cameron

Abstract

Modern society is both technologically advanced and technologically demanding. Competence with digital technologies and the confidence to utilize them are increasingly important aspects of social and career engagement and development. High school students cannot be assumed to possess an innate understanding of digital and online technologies due to younger generations growing up with widespread use of such technologies. As the internet and digital spaces become larger parts of society and educational practices, preparing high school students to be confident in self-guiding online learning or behaviors is necessary. The purpose of this research project is to examine the effect of digital literacy instruction on the self-efficacy, or a sense of self-driven confidence, of high school students. This research project examines research conducted through surveys, primarily of high school students, as well as educators, to study the relationship between the principles of digital literacy and the development of online self-efficacy. Findings from this research project indicate that high school students do not share a universal and consistently well-developed understanding of digital technologies and their use; unfamiliarity with certain risks from online behaviors being a significant blind spot. Instruction in digital literacy was found to improve the foundational knowledge of high school students, as well as building a greater sense of confidence among high school students when online.

Chapter 1: Introduction to the Project
Background

The 21st century has seen an unprecedented advancement of how information and media in general is created, shared, and consumed by global audiences. The prevalence of the Internet in everyday life results in near-limitless information being widely available at the press of a fingertip. Technological innovation has allowed anyone with access to ubiquitous devices like smartphones, Chromebooks, or laptops to receive digital media and produce their own to share with an equally wide audience. This ease of sharing has made mass media messaging an extremely efficient and wide-reaching practice, allowing a specific voice or perspective to be spread across the entire globe. The sheer amount of media on the Internet competing for the average user's attention means that almost any subject of interest can be searched online with hundreds of thousands of results. Mass media communication has tre-

mendous potential for platforming individuals to share themselves and their beliefs with enormous digital audiences. However, for younger generations of students who must grow up navigating complex digital spaces, the vastness and complexity of the mass media messaging that digital technology provides may be just as overwhelming as it is empowering.

Perspectives on modern day students are typically associated with technology use; generations such as Generation Z and beyond have been termed "digital natives" because, since birth, they have always had access to the Internet, social media apps, and streaming entertainment. These younger generations seemingly appear at-home with the constant-connectivity present in the modern technological landscape. This assumption, however, that any student who grew up with the Internet is inherently literate with digital technology and media, is not necessarily accurate. Access to technology does not automatically translate to proficient digital literacy and the assumption that students do not need education in digital literacy ignores the possibility that many students may lack digital competencies which could impact their academic or professional success. Furthermore, the absence of formal instruction in digital literacy can possibly undermine students' sense of confidence or self-efficacy as they explore online spaces and attempt to make their individual voices heard (McCarron & Frydenberg, 2023).

Self-efficacy, or the confidence of an individual's belief that they can succeed or accomplish a specific task, is fundamental in the development of digital literacy. Digital literacy and online learning relies heavily upon intrinsic motivations and the building of computer self-efficacy (CSE), which allows a student to feel capable of using digital technologies to pursue their own interests and accomplish their own goals. CSE is a significant factor influencing students' anxiety when learning online and navigating online educational spaces. Higher CSE in students is associated with lower anxiety in students when they are active in online spaces (Azizi et al., 2022).

While the modern concept of digital literacy as the information dissemination from digital media sources on the internet is relatively new, media literacy itself is a topic of study reaching as far back as ancient Greece. Media literacy practices in ancient Greece, which focused greatly on their oral traditions such as public debates or plays performed to an audience, utilized critical questioning to build an understanding of contemporary culture and information sharing. With the development of technology, contemporary culture also evolves as the means of sharing information expands in the cultural zeitgeist. By the early 20th century, motion pictures were beginning to be established as a viable means of teaching middle school and high school students as noted by Indianapolis educators in 1922's issue of Visual Education. While there were attempts to more greatly incorporate multimedia formats such as motion pictures into mainstream educational practices, such as the formation of the Society or Visual Education, many such publications did not prove successful and digital media literacy has largely remained a fragmented field of study. The

1970s and 1980s saw cultural attitudes towards mass media and its relationship with culture shift, with increased concerns about media's ability to shape cognitive development of adolescents (Hobbs, 2010).

With further increase of audiovisual content in mainstream culture, in large part due to the increased capacity to share such content through the internet, the early 21st century saw attempts to establish media literacy educational practices that focused heavily on harm reduction. These practices sought to identify harmful or negative effects on individuals accessing media on the internet and how to instruct individuals to protect themselves accordingly. Through this perspective, the most frequent forms of digital media literacy instruction come in the form of parental oversight and intervention techniques to prevent harmful media exposures. Harmful media is typically identified by its subject matter, such as violent and sexualized media. While practices have evolved since, these early frameworks conceptualized digital literacy largely as a means to combat mass media that could result in negative outcomes for students of any age (Hobbs, 2011).

Recent efforts to establish digital literacy as its own field of study in education seek to frame the consumption of digital media less as a preventative measure against harmful content and more as a skill set in how to access and understand media in general. While a large aspect of digital literacy instruction addresses the necessary technical skills of operating a computer or other devices, there has been a renewed focus on digital literacy instruction as a method of critical thinking. This perspective on digital literacy involves using techniques taken from classical literacy such as evaluating the context, author and purpose of a piece of digital media rather than only written texts (Chen et al., 2011).

With the complex relationship between digital literacy and online self-efficacy, there is a need for continued research, specifically for high school students who, upon graduation, will find themselves in an ever-connected and technologically demanding landscape. The development of digital literacy can potentially benefit high schools by providing skills to critically analyze mass media messaging, an increased sense of self-confidence when exploring online spaces and the capability to create and share media of their own to share their diverse thoughts, opinions, and beliefs to an online audience.

Statement of the Problem

High school students are incredibly invested in digital spaces and technology as it is a key source of social interactions, academic information, and audiovisual entertainment. The daily activities of high school students often take place across a multitude of digital and social media platforms which allows the internet to influence and shape a vast array of experiences that will contribute to the development of any high school student who frequently accesses it. With how deeply digital technologies are integrated into the lives of high school students, it raises questions of internet safety and cybersecurity as well as how those factors may influence the ethical behaviors of high school

students online. Without any academic scaffolding to address such concerns by outlining the best practices for internet safety or the inherent risks of computer use, high school students could have difficulty developing the confidence necessary to effectively utilize digital technologies.

Online safety and cybersecurity is one of many pressing concerns when studying how digital literacy may impact high school students' behaviors. Potential cybersecurity threats are becoming increasingly sophisticated and do not discriminate based on age, making high school students just as at risk as any other demographic on the internet. Cybersecurity concerns largely revolve around the protection of personal user information; there are countless ways private information can be exposed online such as malware attacks which can steal sensitive data. Another risk is online phishing attempts, where bad actors harness the communication technology of the internet to deceive users into exposing their own data. While any user is at risk of these cybersecurity threats, younger users such as high school students are especially at risk due to a lack of awareness about cybersecurity measures and general best practices to employ while accessing the internet and sharing personal information (Blažič & Blažič, 2024).

Concerns over the protection of personal information when online do not stop at the risk of criminal actions taken against internet users. Legitimate educational institutions or technology companies often referred to as "Big Tech" can also be culprits of private information harvesting as many online websites or portals require users to supply specific information such as full names, personal phone numbers, or even home addresses to create accounts. What companies do with this personal information is not always clear to users, with various privacy policies giving organizations a number of rights in regards to how they store, share, and monetize user information. One of the behaviors that leads users, especially high schoolers, to providing sensitive information to technology companies is a desire to access social media platforms where users may build their digital identities and share their thoughts and beliefs with others on the platforms (Gogus & Saygın, 2019).

Another potential concern with how high school students access digital technologies is how users' knowledge and application information ethics, or the lack thereof, may influence online behaviors. Information ethics refers to the legal and societal ramifications of the use of informational technology and the moral perceptions of certain online behaviors when accessing, sharing, and utilizing information. Examples of positive information ethics range from intellectual honesty in the sharing of information, respect and responsibility for the safety of other users' personal information, displays of proper etiquette or "netiquette" when communicating with others online. Information ethics can also include an awareness of the legal regulations with respect to copyright, intellectual property, and rightful ownership of information or data (Hoesung & Seongjin, 2006).

A lack of information ethics among users accessing digital technolo-

gies can have significant consequences. Because of the incredible reach that the internet provides to users, as well as various social media platforms which can increase the virality of shared digital content, there is a high risk of users actively sharing misinformation or disinformation, such as inaccurate, misleading, or outright false information. Sharing misinformation can be done intentionally or unintentionally by users and can exacerbate online disagreements and discourse and mislead potentially widespread audiences (Lahti et al., 2024).

Deficient information ethics can also contribute to increased cyberbullying or online harassment. The internet provides users with relative anonymity when sharing online messages, which can prompt individual users to engage in antisocial actions they may not otherwise do in-person. Examples of this antisocial behavior include cyberbullying or the harassment, defamation, or slander against another online user. This can range from outright insults, orchestrations of harassment campaigns, or even leaking users' private information against their will which can potentially endanger the real-life safety of cyberbullying victims (Ncube & Dube, 2016). The principles of information ethics are meant to prioritize the safety and positive conduct of online users engaging with each other, but the lack of instruction of information ethics can lead to unsafe behaviors with serious societal consequences.

Purpose of the Project

The purpose of this study is to evaluate the impact of digital literacy on high school students' sense of cyber self-efficacy. Without any purposeful instruction or guidance from high schools, high school students may have difficulty developing the necessary skills and attitudes to appropriately access digital information technologies like the internet or any number of social media platforms high school students might utilize. Instruction in digital literacy may have potential benefits for high school students if it allows students to leverage technical and critical thinking skills towards their online activities. Therefore, this study seeks to explore the following questions:

1. Does digital literacy impact high school student's confidence online?
2. How do cybersecurity concerns influence high school students' digital activities?
3. How does digital literacy impact the information ethics of high school students' digital experience?

Possible considerations for how digital literacy skills may improve high school students' self-efficacy concern how high school students utilize technology to create and share information, how to keep their own private information safe, and what best practices are for ensuring students are behaving in a productive and socially responsible manner when interacting with others online.

Theoretical Framework of the Project

This project seeks to investigate how digital literacy may impact high school students' sense of cyber self-efficacy. To establish a theoretical framework for this project, the history and educational impact of self-efficacy must

be defined in relation to the project.

The concept of self-efficacy was first developed in 1977 by psychologist A. Bandura, as published in Psychological Review. Bandura's (1977) contributions to the study of psychology are widely considered groundbreaking, as his self-efficacy framework has become integral to countless scientific studies that research human behavior with relevance to various fields like education or business. As a psychologist, Bandura identified a perceived indifference among behaviorists in regards to the impact of self-processes on an individual's learning. To study the possible research gap, Bandura's research explores how an individual's agency, skillset, and what the individual is capable of accomplishing as a significant influence on human behavior (Pajares, 2003).

Bandura's theoretical framework argues that psychological interventions are most successful when they build upon an individual's sense of self-efficacy. Self-efficacy, which was one part of Bandura's larger study of cognitive theory, suggests that a person's behavior is a mixture of personal factors, the person's environment and the activity or behavior itself. One of the largest topics of focus in the self-efficacy framework is performance outcomes, which attributes an individual's capacity to perform specific behaviors not just on a generalized sense of confidence but on the successful and replicable execution of an action or process. Using observable action as evidence of self-efficacy over nonspecific concepts of confidence or self-esteem avoids unclear expectations for certain behaviors. However, self-efficacy is not universal and does not necessarily translate between fields, meaning that an individual may exhibit high self-efficacy in one subject or activity but may suffer low self-efficacy in another they are untrained in (Bandura, 1977).

Applying the self-efficacy framework to education posits that students' academic success and motivation for learning are positively impacted by developing self-efficacy. Through this framework, higher levels of self-efficacy are considered key to producing positive behaviors among students, such as students setting challenging academic goals for themselves or persisting past difficulties when learning new subjects. The framework also associates low levels of self-efficacy with negative behaviors among students such as avoiding challenging tasks or experiencing high-levels of anxiety (Zimmerman et al., 1992).

This research project's theoretical framework seeks to incorporate self-efficacy as a fundamental concept when studying high school students' behaviors when accessing digital technologies to interact, socialize, and consume entertainment online. Given the various fields of research that self-efficacy is applied to, from education to business, self-efficacy is also applicable to an individual's experience using digital technologies. With self-efficacy's focus on observable actions and achievable skills, the technical skills and knowledge needed to effectively operate digital technologies will take a central role throughout this research project.

Definition of Key Terms

The following terms have high relevance to the research project and will be defined to provide clear vocabulary knowledge in support of the study.

Digital Literacy: The prerequisite knowledge and skills that are necessary to participate in digital spaces such as online forums or social media applications. This encompasses technical skills to operative digital technologies such as smartphones or computers as well as contextual knowledge about constant changes in technology (Kilgariff et al., 2025).

Digital Media: Media that utilizes digital technologies such as computer software and programming to create, host, and share media (Peppler & Kafai, 2007).

Digital Media Literacy: The habits of inquiry and skills of expression needed to be critical thinkers and effective communicators in regards to the creation and interpretation of digital media as a means of communication (Hobbs, 2011).

Online Self-Efficacy: An individual's belief in their own capacity to successfully engage in online learning or social interactions using digital technologies and the connectivity of the internet (Teng, 2024).

Cyber: Relating to or characteristic of the culture of computers, information technology, and virtual reality.

Summary

Digital technologies, such as the internet, smartphones and laptops, have become a significant part of how the average person communicates with others, searches for information or entertainment, and expresses their own opinions and beliefs. A general competence in using these technologies is increasingly more expected by society at large to effectively socialize and build a career. Self-efficacy is a vital component to the developing confidence and capability of students, especially high school students who will find themselves expected to function and communicate in a technologically complicated world. For this reason, it is necessary to investigate how a sense of cyber self-efficacy may be developed and whether the utilization of digital literacy instruction may benefit students as they learn the technical proficiencies required to be a confident and skilled user of digital technologies.

This study will conduct a literature review of relevant research where the literature will be categorized to address the three major questions posed. These categories will examine literature in regards to digital literacy's potential impact on high school students' sense of cyber self-efficacy, potential cybersecurity concerns about high school students' digital behaviors, and the overall role of digital literacy on the information ethics of that behavior.

Chapter 2: Review of Related Literature
Introduction

This research project seeks to examine the impact of digital literacy

on high school students' sense of digital self-efficacy. To this end, the concept of self-efficacy must be investigated, both with the framework's application to the in-person learning behaviors and confidence-building of students but also how self-efficacy is translated to digital tools and online learning. Once an understanding of digital self-efficacy is established, its relationship to high school students must be examined to evaluate digital self-efficacy's level of importance in high school classrooms. With the relative increasing rate of technological development, digital tools and online spaces can seemingly change at a pace too rapid for users to comfortably keep up with. High school students, who are soon to enter a technologically demanding society and job market, are expected to be comfortable with the complex nature of digital tools.

To address how high school students may develop online confidence through the concept of digital self-efficacy, this research project will examine several factors that may serve to build or undermine high school students' sense of confidence when online. These factors include cybersecurity and the potential risk of cyberthreats that can compromise the safety and digital privacy of users. Next, the concept of information ethics will be studied, including the ethical considerations and practices that surround digital technology use such as a respect for private information or adequate fact-checking of online sources. Finally, the application of digital literacy as a strategy for critical thinking when engaging with digital technologies will be assessed to determine its potential impact on high school behavior online.

Understanding Self-Efficacy

Self-efficacy is a social cognitive theory developed by Bandura which posits that a person's belief in their own capabilities to accomplish a task or perform a specific action is a key motivator in learning. The theory of self-efficacy does not center around pure skill assessment but instead focuses on the desired outcome of performing a given skill and a person's confidence that their skill level can, in fact, achieve that desired outcome (Bandura, 1977). In this way, self-efficacy is results-oriented, connecting skilled behavior with anticipated results to a variety of positive learning effects. Bandura's theory of self-efficacy is rooted in psychological research and offers a framework for understanding and predicting the outcomes of various learning strategies. The theory also holds that all psychological factors influence self-efficacy. A person's self-efficacy can be used to predict whether they will utilize coping behaviors when faced with a challenging task, such as the level of effort they will exert and their endurance when persevering past obstacles or other negative experiences (Bandura, 1977). The development of self-efficacy is then built through persistence in activities or behaviors that a person may see as difficult or daunting which creates opportunities to build skill mastery by accomplishing these activities and further developing their sense of self-efficacy.

While the theory of self-efficacy holds that any psychological factor may be an influence, potential influences can be categorized. Bandura's theory identifies four sources that help to build self-efficacy. The first of these sourc-

es is mastery experiences, where accomplishments in skill performance provide a sense of mastery. Next is vicarious experiences, which is where a person may model what success looks like by watching someone else perform the task effectively. Third is verbal persuasion, such as encouragement or assurances by others that the person can accomplish the task. Finally, the last source is physiological and emotional states in which a person gauges their ability to accomplish a task based upon their own emotional reaction, such as anxiety leading someone to think they are unprepared for a difficult activity (Bandura, 1977). These four sources build self-efficacy when they become reliable and repeatable factors in a person's skill development . Self-efficacy is cyclical in nature, as once resiliency is established by accomplishing one difficult task that appeared overwhelmingly daunting at first, it models future behaviors when encountering equally unknown challenges. Reversely, repeated reactions of self-doubt in the face of challenges promotes similar responses in the future. In this sense, self-efficacy is self-sustaining and can be continually built-upon.

Digitizing Self-Efficacy

Digital self-efficacy, also referred to as online or cyber self-efficacy, is the application of Bandura's theory to digital and online spaces such as the internet and details a person's confidence in their ability to specifically use digital technologies. Applying digital self-efficacy to online activities is increasingly vital in a contemporary world where the average person is expected to engage with more digitized forms of labor, communication, and media, both in a personal and professional sense. With self-efficacy's focus on learned skills resulting in desired outcomes, digital self-efficacy pays significant attention to a person's knowledge and proficiency of information and communication technologies (ICT) for operating the digital technologies necessary to participate and navigate in modern society (Ulfert-Blank & Schmidt, 2022). While the tools and applications of digital self-efficacy are heavily technology-based, the framing of these tools as learnable skills aligns digital self-efficacy with the traditional concepts developed by Bandura for in-person learning environments.

Digital self-efficacy goes beyond the simple knowledge of how to operate a computer and instead focuses on the relationship between a person and their digital devices. While the core principles are unchanged from applications of digital and traditional self-efficacy theory, the rapid technological development in modern society necessitates digital self-efficacy as a specialized theory or motivation and learning (Paredes-Aguirre et al., 2024). The specialization of electronic tools can be largely attributed to the independent development of digital tools or applications that often compete with each other to allow users different methods to accomplish the same task. As a result, one of the biggest complexities when gauging digital self-efficacy is the vast variety of skills or tools that can be necessary to operate digital technologies and engage with others in online environments (Alghamdi & Sideridis, 2025). While self-efficacy in reading has many influencing factors, the skill of reading itself can be applied to multiple written texts. With a given digital skill, the skill could have

countless applications depending on factors such as user interface, user licenses or permissions, or software and hardware limits.

A growing sense of digital self-efficacy can have a significant impact on a person's career and professional development. A higher sense of digital self-efficacy has been found to be positively associated with an individual's likelihood to pursue digital or technologically-demanding careers (Zhao et al., 2025). Digital self-efficacy is also an indicator of the potential emotional behavior of a person when placed in a job or industry that relies heavily upon digital integration of technologies. High digital self-efficacy in employees is linked with better work attitudes and more positive mental health outcomes, with employers utilizing training programs to improve digital self-efficacy as a means to combat work-related stress (Paredes-Aguirre et al, 2025). Assessment of a person's digital self-efficacy is an increasingly influential factor in predicting future success and the growing anticipation of citizens with well-developed digital self-efficacy from academic institutions and job markets make studying the subject necessary.

Digital Self-Efficacy for High Schoolers

As technology becomes further integrated into educational settings, digital self-efficacy can be a large component of high school students' academic outcomes. Between online research assignments, digital presentations, and long-distance collaboration between peers, high school students are increasingly expected to independently operate these digital technologies and to take full advantage of them in support of their learning. High school students with strong beliefs in their ability to effectively use these tools and achieve desired outcomes for their assignments are more likely to engage with these technologies rather than avoiding or working around them (Triana-Vera & López-Vargas, 2025). Conversely, a lack of digital self-efficacy could then result in students feeling overwhelmed and refusing to utilize these tools or to only use them to a minimal extent. The last decade has seen online and digital tools become a significant part of educational practices. The COVID-19 pandemic, which began in 2020, led to widespread school closures and a renewed focus on remote learning solutions to facilitate quarantine procedures (Jamal et al., 2025). While distance learning solutions were developed before the pandemic, COVID-19 saw a rapid increase in sophistication of educational telecommuting devices. The transition to digitized learning accelerated the speed at which countless students had to learn digital skills and technologies to engage in remote-learning environments (Saidi & Arefian, 2022). Regardless of prior experiences with technology among students and educators, such as virtual learning software or teleconferencing, they were thrust into a situation where the application of these tools could mean the difference between successful and unsuccessful student engagement. Assessment of digital self-efficacy can also provide useful data for charting potential future plans for high school students. High school students with stronger digital self-efficacy have increased confidence in using digital technology for in-person or virtual classrooms,

which is a key indicator for a student's potential academic and career development, such as greater participation in STEM fields (Birney & McNamara, 2024). The framework of digital self-efficacy can provide additional context and indicators of skill level or placement for high school students, giving educators another set of tools to assess where their students are at, academically. Levels of digital self-efficacy do not only relate to positive outcomes but can provide indications about negative outcomes as well.

Levels of digital self-efficacy can also indicate high school students' anxiety levels when participating in a course. Electronic learning, or e-learning, comes with a myriad of complications not typically associated with in-person learning, such as a reliance on home internet connections or the ability to operate digital technologies without direct supervision. Stronger self-efficacy is associated with decreased levels of anxiety in online courses which suggests that fostering digital self-efficacy can mitigate the difficulties of virtual classrooms and improve students' comfort and satisfaction with the course (Azizi et al., 2022). Like traditional self-efficacy principles, digital self-efficacy identifies attitude as a central element of a learner's confidence during any learning behavior. The extent of a high school student's experience with digital technologies has a direct connection to their digital self-efficacy as consistent and successful engagement with digital platforms is associated with improved attitudes among students when using electronic tools in their curriculum (Zhang et al., 2024).

A comprehensive understanding of high school students' digital self-efficacy not only has positive implications for students, but for educators as well. Educators incorporating digital self-efficacy into assessment tools can better measure student readiness and build digital materials or learning environments to meet student needs (Ramazanoglu et al., 2022). The digital self-efficacy of high school students can indicate their likelihood to engage with a curriculum that incorporates electronic tools educators may incorporate into the curriculum. Assessing digital self-efficacy while building curriculum can assist in the development of effective and adaptive scaffolding that utilizes computer-based learning by providing personalized educational support (Triana-Vera & López-Vargas, 2025). Digital scaffolding techniques have implications across a variety of subjects and grade levels. Covid-19 saw a universal transition, albeit temporarily, to a near-completely virtual setting where scaffolding techniques that incorporated digital technologies became a necessity to run engaging classrooms.

It is important to consider that the advantages of incorporating electronic tools like smart devices and internet applications can be severely undermined by potential risks found online. These risks can even come from other users who are operating as bad actors in digital spaces and can compromise a user's personal information and even safety. The uncertainty and severity of these potential risks can negatively impact the development of digital self-efficacy, both for regular users and high school students, by eroding confidence

in a user's safety and capability to remain safe in cyberspaces.

Cybersecurity Threats

Cybersecurity threats are a serious concern that can undermine a user's confidence when using digital technologies like the internet, through personal harassment from cybercriminals and even coordinated digital attacks on companies or organizations. With the increased reliance on digital technologies and online platforms to engage in day-to-day activities, commerce, or labor, the potential risk of these technologies being compromised with cyberattacks becomes amplified (Alsodi et al., 2025). These threats take on a vast variety of forms and can be specially designed to target different aspects of digital infrastructure and user data. Companies and organizations are often faced with difficult decisions while developing sophisticated strategies that can combat the equally sophisticated nature of cyberattacks (Zadeh et al., 2020). The rate at which these cyberattacks can be created and tweaks to circumvent cybersecurity protections can potentially outpace the speed at which global cybersecurity techniques can develop safeguards against it, leading to the necessity of general safety tips that are unlikely to change from cyberthreat to cyberthreat.

Potential Vulnerabilities to Cyberthreats

Cyberthreats are specialized in the type of digital information they try to breach and access, with certain categories of digital technology being more tempting targets. A significant number of cyberthreats specifically target peer-to-peer communications and data systems as these technologies are becoming increasingly important in information and finance technology (Zadeh et al., 2020). Since these technologies rely on the discipline of the users operating them, it leaves these types of digital tools especially vulnerable to attacks. These attacks are meant to bypass security measures and compromise information confidentiality, integrity, and availability which can lead to significant financial impact for companies or individual users who had their information held by these companies (Zadeh et al., 2020). Motivations behind these attacks can range from the cybercriminal's financial gain through leveraging personal information, exploiting or blackmailing institutions, or to purposefully damage individuals or institutions with malicious intent. The number of people who can be impacted by these cyberattacks can be astronomical, with unauthorized access to user data leading to incidents where millions of personal records were exposed (Zadeh et al., 2020). In response, efforts to build robust cybersecurity infrastructure have taken on an equally intense pace. The market for global cybersecurity is undergoing substantial growth, with estimates on global spending on cybersecurity placing it at upwards of $87 billion in 2024 alone (Alsodi et al., 2025). This is in stark contrast to previous years' spending, even just five years back. 2019 saw global spending on cybersecurity at $40.8 billion, steadily growing to $71. Billion by 2022 (Alsodi et al., 2025). The financial commitment to safeguarding digital technologies is evident, as is the perceived danger of the cyberthreats this spending is meant to protect against.

Types of Cybersecurity Risks

The multifaceted nature of cybersecurity threats results in a number of different types that must be considered. Several of the most severe cyberattacks include distributed denial of service (DDoS) attacks, phishing attempts, and malware (Aslan et al. 2023). These types of cyberattacks can be highly evasive and difficult to spot or guard against for untrained users. The cybersecurity risk posed by DDoS attacks comes from the threat's strategy to overwhelm networks and devices with traffic, or a high number of individual users or data streams accessing a service, which renders a service or website unavailable as the service has too much information to process at once (Fathima et al. 2023). DDoS attacks are particularly threatening because they do not necessarily require any private data or infrastructure to be compromised, instead using coordinated attacks through public access to cause harm.

The digital self-efficacy and confidence of users on the internet can be undermined by cyberthreats that prey upon social interactions, such as phishing attempts. A phishing attempt is a type of cyberattack designed take advantage of human vulnerabilities to trick individual users, either on a personal basis or users operating in an official capacity for an organization, into revealing sensitive or confidential information through traditional communication channels like email or direct messaging (Lei et al., 2024). The specific strategy used in phishing attempts can vary greatly and take on a social nature. Cybercriminals using phishing attempts may try to impersonate people who the target user trusts, or establish a personal connection based on the user's vulnerabilities, all in an effort to acquire private data like passwords or financial information (McAphee, 2021). Specific techniques for detecting phishing attempts can be difficult to develop because of how frequently the constructed narratives behind the attempts change. Awareness of phishing attempts can vary greatly from user to user, as the authenticity of suspicious emails or direct messages must often be determined by the user themselves on a case-by-case basis (Sharevski & Jachim, 2022). The consequences of falling victim to these phishing attempts can be severe and often strike on platforms where users are least prepared to anticipate these cyberthreats, such social media or other entertainment sites. With social media platforms alone, 2020 saw over 240,000 phishing victims who reported a combined loss of $50 million (Lei et al., 2024 .pdf). Many social media platforms are designed for the easy exchange of information, often of a personal nature, through public posts on user profiles or direct messaging that allows users to engage in peer-to-peer communications with minimal oversight.

Malware is another dangerous cyberattack that, once delivered, abandons all context of social manipulation by hijacking a target user's device directly. Malware is software designed to infect another user's device, like a smartphone or computer, and begin an automatic harvesting of valuable data to be sent off to the malware's developer while simultaneously compromised the targeted user's access and controls to the device (McAphee, 2021). While

there is any number of delivery means for malware, such as clicking on a link in a suspicious email similar to phishing attempts, once the malware has infected the user's device, the cyberattack transitions purely to an automated process that is difficult for users to meaningful combat before severe damage has already taken place.

The variety of cyberthreats make it difficult to develop and employ comprehensive cybersecurity countermeasures against. Perhaps more dangerous is the sheer frequency at which these attacks may target users or organizations. While users and digital infrastructure may be prepared for the majority of cyberattacks, the high number of these attacks make continued protection much harder to ensure on digital platforms. Cybersecurity concerns are pressing for adults and reinforced by workplace guidelines, but for high school students who may be first learning about operating and engaging with digital technologies may be at even greater risk to potential cyber attacks.

The Relationship Between High School Students and Cybersecurity Principles

With younger generations that have grown up with the ubiquity of the internet, the expected age of participation skews younger and younger, intensifying the need to implement cybersecurity protections to mitigate risk (Blažič & Blažič, 2024). The sheer rate at which younger users, such as high school students, engage with electronic technologies and digital space puts them at exceptional risk. Studies indicate that almost 95% of surveyed high school students have a smart device or easy access to one, with 45% of high school students using the internet almost constantly for online activities (Altarawneh et al., 2025). The day-to-day applications of digital technologies like the internet or social media platforms make the use of these technologies appealing in both personal and educational settings. High school students are exceptionally invested into the internet and are integrating digital technologies into more and more of their social and academic experiences.

Younger users like high school students may generally develop basic digital skills, such as search functions on the internet or direct messaging through social media applications, because of the intrinsic motivation of learning these tools to pursue personal interests. Further studies found that 88.4% of high school student respondents reported being comfortable with the use of information technology and 73.7% of respondents even using it for their classwork (Gogus & Saygin, 2019). Such rapid adaptations to the integration of digital technologies can have both positive and negative impacts. While these behaviors may lead to increased and more sophisticated engagement, they also present increased risk of exposure to potential cybersecurity threats like the violation of privacy or exposure to malware (Blažič & Blažič, 2024). By having a near-constant presence online, high school students potentially open themselves up to increased opportunity for cybercriminals to take advantage. With training and experience being key factors in awareness for cybersecurity risks, it calls into question how prepared high school students are for these

threats. It is often assumed that, having grown up with digital technologies, younger users like high school students are naturally intuitive at using electronic tools like smart devices or the internet. It is important to assess these assumptions and perceptions to ensure they hold true.

How high school students perceive their sense of digital privacy can significantly impact their online engagement and data sharing practices. High schools students do possess an inherent sense of personal privacy, referred to as an internal personal data privacy algorithm, which serves as a framework for how they manage personal information with increased scrutiny over data safety towards outside individuals or organizations that do not comfortably fit within the personal boundaries of this framework (Gogus & Saygin, 2019). This indicates a surface-level awareness about the potential risks of online engagement that does shape high school students' behavior on the internet, but this awareness is not necessarily applied to an appropriate extent for effective data safety. In spite of possessing a general awareness, a high number of students may still engage in risky online activities such as trading privacy, like posting public photos or location information, for perceived social rewards like popularity are higher engagement on posts; these behaviors may be compounded by high school students' lack of understanding of the privacy controls offered on many social media applications (Gogus & Saygin, 2019). The context of information sharing appears to be a potential factor in high school students' attitudes towards data privacy, with high school students establishing more stringent boundaries with private information when unvetted entities request it, but more freely sharing this information in social settings with more visible peers where there are perceived benefits of disclosing private data. In the absence of more purposeful cybersecurity techniques and a general lack of awareness about social media privacy controls can potentially leave high school students with wide gaps of vulnerability to cyberattacks.

High school students may possess a general awareness of the need for strong passwords to protect access to online accounts, a majority do not apply this principle and utilize weaker, easier to compromise passwords that increase vulnerability to unauthorized access (Altarawneh et al., 2025). Similarly, poor password management can also lead high school students failing to apply other best practices such as having unique passwords for different accounts and not sharing passwords with others. The compromises can potentially come from ease of access, but can also be attributed to a lack of background knowledge. Oftentimes, inconsistent application of cybersecurity principles comes from students having little-to-no formalized education on the subject. Research indicates that cybersecurity issues or poor user behaviors are often rooted in a lack of foundational knowledge and purposeful education on cybersecurity for younger individuals (Altarawneh et al., 2025). General principles may be shared as common knowledge among high schoolers but more exact practices for how to protect personal information or the multitude of ways privacy invasion can manifest leave high school students with no real guidance on

how cybersecurity principles are applied. Specialized instruction can bridge this gap, as 62% to 74% of students taking cybersecurity classes report varying levels of increased confidence in applying cybersecurity principles as a result (Blažič & Blažič, 2024). There is a significant difference between the inherent awareness of younger generations who have grown up with easily accessible digital technologies and actual strategies that can shape online behaviors to be safer and better protected. High school students, through near-constant use of these technologies, possess basic familiarity with the potential risks of hosting private information on the internet but have knowledge gaps for the finer aspects of cybersecurity practices. The sheer amount of access and time high school students have with the internet make them exceptionally vulnerable to cyberattacks as more and more of their lives are experienced in these digital spaces for other users to access.

Information Ethics

Information ethics (IE) when using digital technologies is a framework for understanding and applying responsible conduct, especially when engaging with other users online. The field of IE addresses the moral ramifications and potential issues that stem from the creation, access, use, and dissemination of information on the internet or related technologies (Marreiros et al., 2024). While online information sources are plentiful and streamline search activities, the sheer abundance of information, uploaded by possibly anonymous and unvetted users, has the potential to compromise any information a user comes across. This pervasive nature of digital resources, with sometimes unclear sources and unknown reasons for being shared with users, requires additional forethought and regulation by individuals, especially students, when they engage with such information on the internet (Ebiefung, 2023). With uncertainties of internet usage, best practices can often remain unclear for users, leaving many users to make self-judgments about what behaviors are safest and most appropriate for themselves and other users.

The framework of IE is designed to reinforce responsible behaviors to regulate such engagement. IE has four fundamental principles to serve as guidelines: respecting and upholding privacy, intellectual property, fair representation, and nonmaleficence (Severson, 2015). With personal information of users always at risk of being leaked to the public, every individual who engages on the internet has a responsibility to safeguard this information if they come across it and to protect all private data from unintentional disclosure. Respect for intellectual property is meant to instruct users on exhibiting due deference to the source or creator of information and ideas, which is crucial to ensuring reliable information and intellectual honesty. Fair representation is similar in that it places responsibility with a user to fairly represent information online and to not misconstrued, manipulate, or otherwise spread false information. With the anonymity of the internet, users having a personal sense of fair representation is vital to maintaining accurate and reliable digital information for other users. Finally, the principle of nonmaleficence can be applied

to any action or behavior on the internet or any of the previous principles, as nonmaleficence is an obligation among users to do no harm. Several of IE's principles can be unknowingly violated due to a user's ignorance or poor digital habits which may result in negative outcomes. Maleficence is intentional action of bad actors on the internet to harm other users such as purposefully compromising private data or spreading misinformation for personal benefit. Actions of maleficence are deliberate choices and highlight one of the most important aspects of IE, which is individual users' perspectives.

Attitudes and Information Ethics

IE research must often take into account the personal attitudes and perceptions of users in various online scenarios or questionable ethics. Studies will often utilize real-life ethical dilemmas that an individual may counter online to assess user responses, an example being how users would handle a breach of another user's data privacy (Ünlü & Öz, 2024). Achieving an understanding of these responses can prove invaluable for developing better online policies for websites and other online platforms. A general lack of awareness regarding information ethics can result in unethical online behavior among users of digital information technologies, which can have negative impacts on an individual, group, and organizational level (Marreiros et al., 2024). Many IE principles share foundations with civic principles instituted in-person to promote safer and more equitable communities. The difficulty lies in translating these principles to online spaces where personal accountability is harder to establish and relative anonymity allows bad actors to avoid consequences for negative behaviors. With online platforms being increasingly sought after by younger generations of users for communication, information and entertainment, robust education on information ethics is essential for building a healthy digital society (DiGiacomo, 2021). With high schools often being the last point of contact to formal education for many individuals, it is important to assess how IE manifests in high school students' culture and behavior when engaging with digital technologies.

High School Students and Digital Information Ethics

A frequent theme among the study of internet and information ethics among adolescents is the presence of social media use disorder (SMUD). Social media use disorder describes addictive or excessive use of digital social media platforms to the point where it begins to interfere with daily life and behaviors. The presence of SMUD symptoms is often an indicator of poor information and digital ethics, where the utilization of digital technologies takes an unprecedented and unhealthy focus in an individual's life.

A serious potential breach of information ethics among high school students is Cyberbullying. Cyberbullying involves the defamation or spreading of false rumors about individuals on digital platforms, primarily social media (Ncube & Dube, 2016). With younger generations having a near-constant presence on the internet, these harassment efforts can often feel unescapable. While all adolescents face the risk of being victimized by cyberbullying, the

risk can increase with age. Older adolescents, such as 13- to 15-year-olds, are more likely to encounter daily social media threats than younger peers, including those aged 11 and under (Lahti et al., 2024). The highest likelihood of cyberbullying for adolescents peaks during high school, making this period of students' academic careers an acute point of concern. The number of students in a given high school population who may experience elements of cyberbullying can be statistically significant. Among adolescents, 20% to 40% on average report being victims of cyberbullying; as for perpetrators of cyberbullying, 3% to 36% of adolescents on average admit to engaging in this behavior (Evgin et al., 2025). The likelihood of high school students experiencing or engaging in cyberbullying is significant enough to make it an area of concern. The consequences of these behaviors on both the victims can be exceptionally disruptive to their emotional wellbeing. A study found that 93% of students who reported being cybervictims listed negative psychological effects such as feelings of sadness and hopelessness, as well as being twice as likely to have attempted suicide as other respondents who were not reported cybervictims (Nixon, 2014). Outcomes of cyberbullying can be severe, with major impacts on student self-esteem, attitude, and even safety. Social interactions from digital platforms manifest with real-world consequences. While the negative effects of cyberbullying are clear, SMUD has an impact on the likelihood of students being cybervictimized as well. SMUD use among high school students is associated with increased likelihood to either engage in cyberbullying or cybervictimization as well as an overall increase in ages also associated with higher risk of these factors (Evgin et al., 2025). SMUD does not only result in cyberbullies being more likely to engage in harassing behavior due to unhealthy levels of internet use but cybervictims are also more likely to experience the negative impacts of cyberbullying by having a greater online presence and investment in digital platforms. To counteract the likelihood of cyberbullying among adolescents, the most natural strategy is a renewed focus on in-person experience where students can engage with one another and form bonds that persist outside of social media settings Stronger in-person relationships among high school students is associated with a decrease in cyberbullying, as peer relationships had a predictive power of -0.44 (p < 0.001) on cyberbullying (Cantekin & Ozen, 2024). Both cybervictims and cyberbullying perpetrators, in-person relationships with peers have the same effect of reducing the presence of cyberbullying on both ends of the behavior. Less time on digital platforms like social media applications and a diminished impact of SMUD allow adolescents to view peers less as obscure entities on the internet and more as a community with more positive social interactions and consequences for negative behaviors.

SMUD also has an impact on the private data protection practices of adolescents. Higher data privacy skills is associated with decreased levels of social media addiction with the reverse holding that higher levels of social media addiction being associated with lower data privacy skills (Üstündag et al.,

2025). Excessive internet use creates increased opportunities for data privacy to be breached as more compulsive digital behaviors indicate less discipline in the protection of personal data. Increased adolescent investment in digital platforms also results in more private data being generated in the first place. By having a greater share of adolescents' lives being integrated into the internet, the separation of personal information and online presence deteriorates to the point where the risk of private data being exposed is more pronounced.

The spread and consumption of misinformation is also another pressing issue of information ethics among high school students. A study found that, when browsing social media, surveyed high school students were generally able to distinguish news sources from opinion pieces but 60% of the surveyed students were at a beginner level when evaluating social media information trustworthiness; the surveyed students frequently failed to identify bias related to political affiliations and often did not verify the accuracy or authority of information beyond what is presented within the initial post (Johnston, 2020). A potential factor of high school students' inconsistent ability to identify misinformation could stem their verification practices. While adolescents possess a general sense of the need to ensure information is accurate before consuming and sharing it, the methods adolescents employ are often insufficient to adequately verify the authenticity of online material. Adolescents often employ superficial strategies to evaluate the credibility of online sources, such as placing trust in websites with .org domain designations or looking for a citation without referencing the cited source; when adolescents do utilize fact-checking, it is typically to confirm existing biases, especially on controversial topics (Besharat-Mann, 2024). This suggests that adolescents often rely on vertical thinking for verification of information sources, meaning they only research for proper citations and evidence on the initial website where the information in questions was gathered from. Conversely, adolescents more rarely employ lateral thinking by going to outside sources, such as other websites or publications from credible authors and organizations to fact-check suspicious information. These tendencies leave high school students less prepared to follow up on the authenticity of information as the breadth of their fact-checking search is quite limited. Another study of 3,446 high school students across 16 districts assessed respondents' ability to evaluate online information where 90% of the respondents were classified at beginning levels of evaluation, an example of which being 52% of student respondents believed an anonymously posted Facebook video on U.S. voter fraud that substituted information from Russian elections (Breakstone et al., 2021). High school students employ an overall awareness of the internet's risk of misinformation but without more specific techniques to check the accuracy of online sources, high school students instead operate on generalities and basic principles which do not actually provide reliable tools to protect oneself from misinformation.

Digital Literacy

It is easy to categorize digital literacy as the application of the principles of literacy to a digital format, but the answer is far more complex. Digital literacy is multifaceted and evolves with technological trends and advancements, expanding beyond traditional notions of reading and writing to encompass the ever-changing knowledge and skills required for operating digital technologies or engaging with online environments (Chen et al., 2011). With an abundance of digital technologies and media accessible to individuals, a more robust understanding of how these technologies operate is increasingly necessary. The pervasiveness of digital content in every aspect of contemporary society, coupled with a continually changing electronic landscape thanks to the rapid pace of technological progress, makes the fundamentals of digital literacy a near-requirement for full participation in society (Chen et al., 2011). It is important to distinguish that digital literacy does not necessarily function as a form of protection from dangerous digital media or technology. The purpose of digital literacy is not only to avoid negative media or unhealthy technologies, but also aid in the development of necessary skills and intellectual thought processes that can benefit individuals in the wider world (Hobbs, 2011). From this perspective, instruction in digital literacy is about positive learning trends that better equip individuals rather than only shoring up potential weaknesses or vulnerabilities. This is not to say that a lack of digital literacy does not have consequences, but that building digital literacy is a comprehensive measure which results in more technologically well-rounded individuals.

The basic digital proficiencies covered in digital literacy instruction can have significant implications for global workforces and industry. In the United States, over 40 million adults lack the basic digital skills and tools necessary for entry-level jobs (Murphy et al., 2024). A gap has formed between the skills of certain adult workers and the requirements of modern, digitized workforces, making digital proficiency a key aspect of securing employment opportunities. This effectively means that sizable portions of the job market are inaccessible to a large subsection of the U.S. working population, with a lack of digital technology skills barring workers lacking digital training from potential employment. To ensure more consistent proficiencies and a broader understanding of digital technologies, instruction in digital literacy is designed to bridge potential gaps. Digital literacy provides deeper knowledge and understanding of the electronic tools and mechanisms behind much of the digital experiences online, allowing users to be more active in their online engagement, both for the consumption of digital media as well as the production of it, rather than passive acceptance (Kilgariff et al. 2025). By developing a great understanding of the tools and back-end development that goes beyond the surface-level aspects of digital content available on the web, individuals will be better able to assess the purpose and functionality of that content. Instruction in digital literacy is not as simple as reading a manual for a piece of technology.

While an understanding of point-and-click computer skills are an im-

portant aspect of interfacing with digital technology, digital literacy as a field study addresses the greater context of smart devices as tools of human engagement. Digital literacy involves more than basic functional skills with critical thinking abilities being a key factor for individuals to question the purpose and intent of digital content from the authors of the content (Kilgariff et al. 2025). Route knowledge of basic electronic tools do not sufficiently engage with the background by which a piece of digital media is created, so digital literacy instruction goes further by teaching individuals to develop a more complete understanding of the content they encounter. The critical thinking component of digital literacy is the most crucial part of an individual's ability to understand the context in which messages in the media circulate, through which digital mechanisms they are created and why, so that users can employ more strategy into their consumption of media (Hobbs, 2011). As digital media and online platforms become more ubiquitous with everyday life, the critical dimensionality of digital literacy becomes a more central aspect as digital media takes an ever-greater importance in society and culture. With each development in the technology of new digital media, so too must the socio-cultural impacts be studied to fully grasp the influence of digital technology in the 21st century (Chen et al., 2011). While there is a limited timespan of relevance for the specific technical minutiae of digital technologies, all of which will eventually become dated and outmoded by newer iterations, critical thinking in regards to the form and function of digital media in cultural contexts will always be applicable. Rather following distractions of latest technological trends, digital literacy's focus on the ever-evolving relationship between digital technology users is what makes it an important topic of study.

The Interaction of Digital Literacy, Cybersecurity, and Information Ethics

There is significant crossover between computer competencies identified as digital literacy skills and competencies necessary for safe cybersecurity behaviors that mitigate the risk of users. Due to the complex nature of online risks to cybersecurity, as online criminal behavior taken against users often take advantage of hard-to-discern interpersonal gadgets and contexts provided by social media tools, producing a universal set of cybersecurity rules to follow can prove exceedingly difficult. The characteristics of digital literacy skills, such as the employment of a curation process with digital media, an understanding of the social connectedness of digital media tools, and a sense of online digital citizenship are found to enhance cybersecurity awareness and behaviors (Elrayah & Jamil, 2023). This enhancement can be associated with the increased critical analysis called for in many digital literacy skills, instructing online users to be more skeptical of online information and social interaction by assessing how digital tools can augment and drive any exchange between individuals online. Critically assessing digital information before ingesting it results in a proactive approach to cybersecurity rather than a reactive response to violations of cybersecurity after they occur. The ability of users to detect ma-

licious and compromising digital material before engaging with it is essential in protecting users from cyberrisks such as phishing or malware attacks (Frydenberg & Lorenz, 2020). A preventative mindset among users requires critical thinking and awareness of the potential consequences of digital messaging. A foundational element of digital literacy is the consideration of the context behind online engagement or digital media as well as the human implications behind a message's design.

The inherent skepticism of certain online behaviors supported by digital literacy also crosses over with principles of information ethics. The critical analysis of digital literacy also suggests users consider the cultural implications of online behavior, such as the personal responsibilities a user may have when engaging with other users online by highlighting the social dimensions of certain digital actions and the internet systems that enable them (Elrayah & Jamil, 2023). Such a perspective places focus on digital tools provided by the internet as avenues of human expression and interaction. Digital literacy skills frame the ingestion of the digital behaviors of other online users as receiving social inputs, calling for appropriate assessment, respect, and scrutiny of those behaviors as if they were real, in-person, social interactions. This framing can potentially demystify the anonymity between users and reinforce cultural norms and respectful, safe behaviors in online spaces where the digital nature of interaction may otherwise promote antisocial tendencies.

The Relationship between High School Students and Digital Literacy

Digital literacy can have a significant influence on the development of high school students and how prepared they are for future education. There is a significant positive association between digital literacy and academic achievement, indicating that stronger digital skills often lead to better academic outcomes for students (Li et al., 2025). This suggests digital literacy can help foster better academic engagement among students. With digital technologies becoming a larger part of how classrooms expect coursework to be accomplished, developing a more sophisticated understanding of digital tools and capabilities allows students to better showcase their understanding of class content. However, the impact of digital literacy is not only confined to immediate academic outcomes but also future success as well. Digital literacy can also have an overall positive influence on how students view themselves and their confidence to excel in academic settings. A stronger sense of digital literacy among high-school students is reported as having positive associations with the study habits of students when using digital technologies, such as effective goal-setting, learner independence, and self-regulation, as well as improved reading and writing abilities (Kamaie & Baharloo, 2023). This can be attributed to digital literacy providing students a greater understanding of the purpose of electronic technologies as well as why a user would seek to incorporate such technologies into their workflow. With a more nuanced comprehension of how digital technologies are designed to accomplish the objectives

of its creators, high school students can better perceive how available online tools can achieve specific learning goals. Overall, the result of digital literacy's impact on independent student learning is increased confidence by knowing the intended function of digital technologies and how to produce a desired outcome without outside support being needed. A 2024 field survey found that positive student attitudes and digital literacy greatly impacted the reported self-efficacy of first-year university students (Getenet, 2024). As self-efficacy revolves around a given student's feelings of confidence in their own ability to meet goals and produce desired outcomes, digital literacy provides a deeper knowledge of the function behind electronic tools, allowing students a more comprehensive application of such tools in the completion of certain tasks.

Despite the potential benefits of digital literacy, the application of digital literacy is often not reflected in formalized instruction for students. Despite frequent use of digital devices such as smartphones, in one study, almost 16% of incoming first-year college students reported not taking any course in high school that studied computer topics (McCarron & Frydenberg, 2023). This is not to say that digital literacy is completely absent from high schools but that it appears to be rarely incorporated into actual academic study. While the perception of the importance of digital literacies is often reflected in educational settings and daily activities, research indicates that students report receiving no formal instruction on digital literacy and hence, lack any comprehensive coverage of this topic in their education (Smith & Storrs, 2023). This can be attributed to a perceived lack of need for digital literacy instruction among educators. Such perceptions are based on educator's inferences rather than specific data or research. Today's students, having grown up with ubiquitous and easily accessible digital devices, are often labelled as "digital natives" and assumed to possess inherent digital competencies despite findings indicating that students do not have such an innate understanding and need educational interventions to properly develop digital literacy skills (McCarron & Frydenberg, 2023). There are further factors than can undermine students' intuitive understanding of digital technologies. For example, research indicates that high school students can have significant differences in digital literacy due to factors such as grade level, gender and the frequency of internet use (Alghamdi & Sideridis, 2025). The gaps between assumptions and actual capabilities of students may stem from a fundamental misunderstanding of what digital literacy is. While younger students may become adept at using basic functions of digital tools like social media or web searches, they may have difficulty with the deeper critical thinking practices incorporated in digital literacy perspectives, such as the evaluation of online sources' credibility or analysis of the media messages behind pieces of digital content (Hosseinzadeh et al., 2024). This suggests that digital literacy education which focuses on simple proficiency with digital tools is insufficient to prepare students. The intuitive nature of digital user interfaces, allowing users to operate digital technologies on a surface-level understanding, can mask a deeper difficulty with under-

standing higher order cognitive processes that allow users to excel with digital technologies. Such a distinction makes clear that digital literacy education must encompass more critical thinking and analytical skills that go beyond basic digital operating competencies.

Summary

This research project examined how self-efficacy applies to digital technologies in high school settings, with student confidence in key skills remaining central to learning motivation. Several key factors were also assessed for potential impacts on high school students' digital self-efficacy and overall sense of confidence when engaging with digital tools and online spaces. Cybersecurity threats were identified as a significant risk during online activity, with high school students possessing only surface-level awareness of safety procedures and best practices to avoid victimization to cybercrimes. The purpose of information ethics as a set of ethical principles to guide online behavior was also assessed, with a lack of information ethics potentially resulting in negative outcomes for users such as cyberbullying. Studies found that high school students report severe negative psychological responses to online harassment, while other students admitted to even engaging in the behavior.

Finally, the study of digital literacy was reviewed as a critical thinking perspective on the utilization of digital technologies. Digital Literacy's focus on understanding the creation and purpose of digital media and online messages was identified as a core component in digital literacy education as route technical knowledge proved insufficient for high school students to adequately assess the digital content and tools they engage with. The assumption that high school students had an intuitive mastery of digital technologies was challenged, with high school students being especially vulnerable to or even engaging in cyberthreats or unethical online behavior. High school students were found to benefit from purposeful education on digital technologies and reported an increased confidence when engaging with online environments. Chapter 3 will examine the possible benefits of digital literacy instruction on high school students' online self-efficacy, such as providing a sophisticated and critical understanding of digital tools as well as how to stay safe from potential cyberthreats that can undermine user confidence.

Chapter 3: Implications
Introduction

This research project seeks to investigate the self-efficacy of high school students as they explore the internet or other digitized spaces and how a developed or undeveloped sense of digital literacy may impact confidence. The confidence necessary to achieve true self-efficacy in learning is not a guarantee for younger users, despite high exposure. As established in chapter two, there are numerous factors that can undermine the confidence of high school students utilizing online technologies without additional support, largely categorized into elements such as a critical lack of understanding of the mechan-

ics behind digital tools and interfaces as well as the malicious actions of bad actors who seek to prey upon the digital vulnerabilities of unaware users. To counteract potentially harmful incidents, as well as promote the independent and self-actualized learning of high school students online, education in the basic function of digital tools demystifies the many electronic devices high school students may encounter and provide an understanding that goes far beyond surface-level functionality. Purposeful instruction of digital literacy in high schools may result in a student body that is more familiar with the background processes of digital technologies and how to better utilize such tools to achieve desired learning outcomes.

Conclusions

The building of digital self-efficacy is crucial for high school students to better utilize computer technologies in preparation for joining a technologically sophisticated society, with higher digital self-efficacy leading to higher and more proficient engagement with digitized systems (Triana-Vera & López-Vargas, 2025). With confidence playing a key part in self-efficacy as a learning motivator, the more confidence a high school student has in their ability to operate computer technologies, the more likely they are to engage and more freely incorporate digital tools into their learning behaviors.

Digital literacy, as an in-depth study of the digital processes that drive computer technology is a great asset in building the user confidence necessary to support digital self-efficacy. Instruction in digital literacy has a positive impact on the academic achievement of students (Li et al., 2025). This is accomplished by encouraging students to examine digital technologies beyond routine functions and instead assess the purpose and intent of computer systems as a form of critical thinking. Digital literacy as a method of critical analysis frames digital technologies as a communication tool that can facilitate the intellectual objectives of its users. By studying the purpose behind everyday technologies and the intentions of the authors of online content, high school students can better assess their relationship with technology and how computer skills can augment their own capabilities. This supports digital self-efficacy by positioning the relationship between high school students and electronic devices into a productive framework where students can guide their technological behaviors towards desired creative or social outcomes.

The assessment and implementation of digital self-efficacy as a core concept in the learning outcomes of high school students cannot be taken for granted because of the ubiquity of internet-connected smart devices. Despite widespread assumptions of younger generations possessing an innate and intimate understanding of digital technologies, in reality, modern students have a wide range of capabilities, skillsets, and basic knowledge regardless of time spent online or with smart devices (McCarron & Frydenberg, 2023). The assumption that high school students do not need academic support for digital skills and competencies ignores that many students will need additional scaffolding to develop appropriate technological competencies to more ef-

fectively engage with academic coursework and to better protect themselves and other users when online. A complete lack of digital literacy instruction in high schools will leave students to fend for themselves in increasingly complex digital ecosystems, resulting in non-equitable outcomes for all students when engaging in online behaviors.

Practice Implications

As educators incorporate more digital and internet-based technology into classrooms, with expectations that students can independently operate online, it is necessary for teachers to impart digital literacy principles to build a greater sense of self-efficacy in high school students for greater academic engagement. To aid students in the development of a sense of online self-efficacy, high school teachers must build the confidence of students to self-regulate their learning in digital contexts and online settings. Confidence is a central component of self-efficacy as an effective learning motivator for students, harnessing learners' belief in their own ability to achieve desired academic outcomes by performing specific skills and functions with predictable results (Bandura, 1977). If students lack the confidence in executing abilities to reliably produce the intended outcomes, they will have difficulty developing the self-efficacy framework's sense of independence in establishing and pursuing their own educational goals. Teaching digital literacy principles can help bridge the gap for students in building the necessary confidence in digital and technical skills. High school students with a more developed sense of digital literacy report higher levels of confidence in their coursework than students with less developed digital literacy skills (Kamaie & Baharloo, 2023). This is because students who have received instruction in digital literacy skills possess greater familiarity with the background processes involved in digital tools and can move beyond routine technical knowledge, instead conceptualizing technology more as a tool for personal expression.

As educators incorporate more technological aspects into their instruction, they must build digital literacy principles into curriculum and teach students to be more thoughtful about how they engage with digital technologies, with a greater focus on the communicative purpose behind digital devices rather than just how to operate such devices for classroom purposes. The critical thinking embedded in the foundation of digital literacy frames electronic technology as tools with an intentional function for human interaction, with each online gadget built with an intended outcome in mind by its creators (Kilgariff et al. 2025). Teachers should use digital literacy instruction to guide students to view technology with a critical lens and to consider how the shape and form of software or hardware is influenced by the intended purpose of using it. With a greater understanding of the relationship between digital design and desired outcome, students can better conceptualize how they can interface with the processes of digital technologies to achieve desired objectives, either personal or academic. By strengthening the digital literacy skills of high school students, teachers can help students better comprehend why

certain digital technologies are incorporated into the classroom which can lead to students harnessing school technology without the need for continuous classroom oversight. In this way, teachers can utilize digital literacy instruction to produce the sense of online self-efficacy in high students that is needed for students to self-motivate on learning objectives in digital spaces because they can see how their digital skills can produce specific outcomes.

Policy Implications

Regardless of the possible instructional benefits of digital literacy, high schools must incorporate basic digital literacy training into computer use policy for students because of the potential safety concerns when high school students utilize internet-accessible technology. Computer use policy that reflects the critical thinking principles of digital literacy is essential for high schools to educate students on possible risks of online engagement and best practices for students to protect themselves from other users. Vulnerability to cybersecurity threats among high school students, especially through unsafe online behaviors, is typically linked to a lack of concrete cybersafety instruction (Altarawneh et al., 2025). Because cybersecurity threats often rely on subtle, social contexts to maliciously manipulate users, it is often hard to differentiate legitimate social interactions from unsafe or criminal behavior. High schools should adopt computer policies that implement digital literacy's focus on the analysis of a digital content's purpose and function to prepare high school students to thoroughly assess the media messages they come across. The foundational skills of digital literacy are associated with increased cybersecurity awareness (Elrayah & Jamil, 2023). By incorporating digital literacy into specific policies, high school administrations can promote an analytic approach to ingesting digital messages and media among students which can result in a preventative mindset for better cybersecurity in classrooms. The foundational technical knowledge provided by digital literacy can also give students a more complete understanding of how their private information can be used and acquired by others, both on a personal level and for the use of any school-provided credentials.

Directions for Future Study

One direction for future study regards the nature of how digital literacy skills are incorporated into classroom settings. The data utilized in this research project reflect that digital literacy skills and other computer use techniques are frequently incorporated into courses that study other topics, such as Language Arts or History. In such scenarios, while students receive instruction in digital literacy, it is often supplementary and done through the perspective that digital literacy and computer use is yet another tool in service of studying more traditional academic subjects. One recommendation for further study is the focus of research on high school courses that treat digital literacy as the primary subject of study and not as a vehicle to aid in coursework for other subjects.

Another area for future study is the effect digital literacy training can

have on teachers themselves. Several studies utilized in this research project referred to the potential of digital literacy to support the career development of educators. As instructors incorporate more technological tools into classrooms, it stands to reason that the instructors themselves could greatly benefit from additional training in how to critically analyze the relationship between computers and computer users.

Summary

The goal of this research project was to investigate the potential impact of digital literacy instruction on the online self-efficacy of high school students. Three research questions were established to assess the impact of digital literacy on online self-efficacy. The questions regarded digital literacy's impact on high school confidence online as well as how high school students reflect on possibly confidence-jeopardizing concerns such as cybersecurity risks or poor information ethics online.

Self-efficacy served as a framework for this research project and was identified as a powerful self-motivator by enabling learners to harness confidence in actionable and repeatable skills to produce desired results and reliably achieve intended educational outcomes. The confidence reinforced by self-efficacy as a framework for learning encourages students to set personal learning objectives as they can see how their abilities translate to specific outcomes. The transition of self-efficacy to digital spaces contextualizes online behaviors of users as equal avenues of skills-based learning.

Potential factors that can limit the confidence and self-efficacy of high school students were identified, such as the malicious actions behind online threats to cybersecurity or potentially poor cultural and informational ethics of other users, which both harness the uncertain and anonymous nature of social interaction on the internet. For matters of cybersecurity, high school students possess surface level knowledge of the risks when engaging with others online, but often fail to implement appropriate tools to protect against cybersecurity risks. In regards to considerations of information ethics, high school students were found to have a substantial likelihood to be victims of poor information ethics such as cyberbullying, as well as possessing a higher likelihood to keep poor password privacy due to high internet usage. High school students were also found to frequently have inadequate abilities to separate accurate information from misleading content or misinformation.

Digital literacy was introduced as a field of study to critically analyze digital messages or digital media as well the intentions of users who author such content and how computer technology may shape that content. High school students who underwent digital literacy training reported an improved sense of confidence when engaging with the internet because they possessed a greater understanding of the processes behind digital media, as well as the purpose behind digital technologies design and intent. The critical thinking and awareness associated with digital literacy is a potentially vital tool to building the confidence and self-efficacy of high school students in a modern age of

increasingly unprecedented technological growth and connectivity.

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The Impact of Montessori on the Social-Emotional Development of Elementary Students with Attention Deficit Hyperactivity Disorder

Jamie Cano

Abstract

Elementary-aged students with attention deficit disorder (ADHD) have difficulties with behaviors and learning difficulties in the school environment that impact their social-emotional development. This research investigates whether the Montessori Method has a positive impact on the social-emotional development of elementary students diagnosed with ADHD. Based on a review of the literature, the results suggest that the Montessori method, with its child-centered approach, effectively addresses the needs of students with ADHD and aligns more closely with how children naturally learn and develop, compared to the traditional education model. The literature reveals that the foundational principles of the Montessori method, including freedom of choice, the multi-age classroom, and the student-teacher relationship, make Montessori education an effective learning method for elementary students with ADHD.

Chapter 1: Introduction to the Project
Background

The Montessori method has been in the United States since 1911 and has gained popularity over the last four decades, largely due to the principles and classroom environment of Montessori (Hiles, 2018). Montessori education's focus on student autonomy and individual exploration has made Montessori schools one of the main alternative choices to traditional education among parents (Fleming & Culclasure, 2024; Esi, 2024; Hiles, 2018). The Montessori Method aligns with a constructivist approach to education, as it has a child-centered focus that fosters the development of both academic and social skills (Lillard, 2017). Parents are drawn to Montessori principles, including respect for the child and a self-directed curriculum (Hiles, 2018).

Understanding the historical context of the traditional education model in the United States is crucial for educators, researchers, and policymakers. The birth of mass public schools coincided with the age of efficiency, leading to the factory-like model of conventional schools (Lillard, 2017). The traditional model treats all children the same and trains them to be alike, a stark contrast to the diverse needs and learning styles of children today (Lillard, 2017). The U.S. education system has been influenced by philosopher John Locke, who believed that children were a blank slate or empty vessel that needed to be filled by the teacher (Resnick & Hall, 1998, as cited in Lillard,

2017). Edward Thorndike, a professor of psychology at Columbia University Teachers College, who, for 40 years, published over 500 books and articles, has been a strong influence on the U.S. educational system (Lillard, 2017). Thorndike viewed teachers as a major force in educating children, believing they impart information and exert control. The 150-year-old teaching practice in our public school system is a model that research shows does not align with child psychology (Thorndike,1906, as cited in Lillard, 2017).

Dr. Maria Montessori was the first female to earn a medical degree in Italy in 1896. However, she is best known for her child-centered philosophy of education (the Montessori method) and her writings on scientific pedagogy (Biography of Maria Montessori, n.d.). In Montessori's book, The Absorbent Mind (1967), she stated:

> The child's development follows a path of successive stages of independence, and our knowledge of this must guide us in our behaviour towards him. We have to help the child to act, will, and think for himself. This is the art of serving the spirit, an art which can be practiced to perfection only when working among children (p. 257).

The Montessori method is a child-centered pedagogy that supports learners at different developmental stages (Montessori & Claremont, 1967). Montessori education is linked to students' intrinsic motivation, academic achievement, and social-emotional well-being (Basargekar & Lillard,2023). Montessori believed that the teacher's role was to be an observer. Through observation, teachers can assess a student's needs and determine the best approach to support them. Beagle (2024) stated, "A Montessori classroom should run on self-regulation, personal responsibility, and social harmony- not adult-imposed rules" (p. 29). The findings showed that when teacher-centered teaching was replaced with individual support, students developed at their own pace, and teachers supported individual needs and talents. (Shalom et al., 2021).

Montessori leaders, educators, and researchers have been dedicated to making Montessori inclusive and accessible to all children (Joslof, 2024). Dr. Montessori's observations of underprivileged children deemed incapable of education prompted her to open her first school in Italy in 1907 (Gentaz & Richard, 2022; Fleming & Culclasure, 2024; Montessori, M., & Claremont, C. A., 1967). Swiss and Chandramouli (2024) found that evidence-based practices (EBP) in special education align with Montessori teacher training. Montessori teachers' training meets the needs of students with ADHD, which is already embedded within the Montessori method (Swiss & Chandramouli, 2024).

Attention-Deficit Hyperactivity Disorder (ADHD) is one of the most common childhood disorders, affecting 11.4% of children between 3 and 17 years old in the United States (Centers for Disease Control and Prevention, n.d.). According to the American Psychiatric Association (2013), ADHD is a neurodevelopmental disorder characterized by persistent patterns of inattention and/or hyperactivity-impulsivity that interfere with functioning or devel-

opment. Children with ADHD are more likely to have lower academic scores than students without ADHD (Christofferson, 2023; Shaw, 2022). Students with ADHD struggle with (a) attention, (b) focus, (c) hyperactivity, (d) impulsiveness and (e) emotional regulation, which affects their ability to succeed in school and where they are expected to focus and pay attention to topics that they have little interest in (Basargekar & Lillard, 2023; Staff et al., 2023). ADHD significantly impacts adaptive behavior and executive function skills, including time management, organization, planning, and multitasking (Fan & Wang, 2023). Students with ADHD often struggle to form and maintain relationships with their peers (Cordier et al., 2023; Goetz et al., 2021). Children with ADHD often struggle with social skills when dealing with peer pressure and can be more susceptible to peer rejection (Berchiatti et al., 2022; Shaw, 2022). Students' impulsiveness and difficulties with hyperactivity can disrupt the learning environment (Shaw, 2022).

In recent years, there has been an increase in the diagnosis of attention deficit hyperactivity disorder. Between 2016 and 2022, one million children between the ages of 3 and 17 were diagnosed with ADHD in the United States (Centers for Disease Control and Prevention, n.d.). With ADHD having a strong genetic component, it is evident that schools and teachers will see more students with ADHD in the future (Abdelnour et al., 2022). Students spend most of their day in the classroom, and teachers are the first to notice symptoms and provide support when students struggle with academic achievement and peer relationships (Bolinger et al.,2020).

Statement of the Problem

Elementary-aged students with ADHD struggle with behavioral problems and learning difficulties in the school environment that impact their social-emotional development (Christoffersen, 2023; Shaw, 2022). Problems related to behaviors typical of children with ADHD predict poorer-quality teacher-student relationships (Zendarski et al., 2020). Teachers' rejection of ADHD students can affect how peers perceive them, and this can lead to rejection, low self-esteem, and the inability to establish a sense of belonging (Ewe, 2019; Harpin et al., 2016). The relationships between students, teachers, and peers in the school environment are important to their social-emotional development. Positive student-teacher relationships are associated with positive peer relationships, high self-esteem, a positive classroom atmosphere, and improved learning outcomes. (Berchiatti et al.,2022, Goetz et al.,2021, Zendarski et al.,2020).

Students with ADHD often struggle to sustain attention on tasks they find uninteresting. Students with ADHD often require control or buy-in when engaging with their work (Basargekar & Lillard, 2023). For children with ADHD, self-regulation and motivation in school can be difficult to achieve due to inattention, hyperactivity, and impulsive behaviors (DuPaul et al., 2022; Staff et al., 2023). A study by Ewe (2019) found that students with ADHD perceived school expectations as challenging, such as paying attention, remain-

ing focused, completing tasks, and being organized. Students with ADHD reported that they did not deliberately act inappropriately to disturb the classroom and that teachers' awareness of this helps them feel understood (Ewe, 2019). Reduced conflict with teachers helps students with ADHD feel more emotionally connected at school, which in turn leads to improved academic performance, relationships, and better long-term outcomes (Rushton et al.,2020).

Parents of students with neurodevelopmental disorders, like ADHD, often look for alternatives to the traditional learning environment. The literature indicates that many parents of children with special needs and ADHD often enroll them in Montessori schools (Long et al., 2022; Swiss & Chandramouli, 2024). However, the number of students with ADHD enrolled in Montessori schools is unknown (Long et al., 2022). Montessori schools have been in the United States for over 100 years. According to the National Center for Montessori in the Public Sector [NCMPS], there are over 3,000 private Montessori schools and 570 public Montessori schools in the United States (NCMPS, 2025). Many Montessori public schools are schools of choice, charter schools, or district schools (Fleming & Culclasure, 2024).

Purpose of the Project

The purpose of this study is to examine the effects of the Montessori teaching methods on the social-emotional development of students with ADHD. Elementary-aged students with ADHD struggle with behavioral problems and learning difficulties in the school environment that impact their social-emotional development (Christoffersen, 2023; Shaw, 2022). Understanding the impact of the Montessori method of education on the social-emotional development of students with ADHD can help families determine the most suitable learning environments for their child's unique needs.

There is literature on the effects of ADHD on students' academic and nonacademic performance (Randolph et al., 2023). There is limited research that studies the social-emotional effects of the Montessori method on students with ADHD. This project also aims to answer the research question: Does the Montessori Method have a positive impact on the social-emotional development of elementary students diagnosed with ADHD?

Theoretical Framework of the Project

Lev Vygotsky was a Russian psychologist whose Social Learning Theory was founded on the belief that children's intellectual development occurs in a social context (Veraksa, N., 2022, as cited by Wibowo et al., 2025). Vygotsky theorized that informal and formal interactions between children and a more knowledgeable other (MKO) significantly influence children's development (Vygotsky, 1978, as cited in Bodrova, 2003). Vygotsky's term, "tools of intellectual adaptation," refers to the problem-solving strategies that children internalize through social interactions (Bodrova, 2003). Intellectual development encompasses thinking, problem-solving, meaning, memory, and perception. A key tenet of Vygotsky's theory is the Zone of Proximal Development (ZPD),

which represents the space between what the learner can do independently and what they can accomplish with the support of a more knowledgeable other (MKO) (Vygotsky, 1978, as Wibowo et al., 2025).

Vygotsky's Zone of Proximal Development (ZPD) is a central concept in his Sociocultural Theory of Learning. The ZPD is the difference between what a student can do independently and what they can achieve with the guidance of an MKO, such as a teacher or peer (Vygotsky & Cole, 1978). Within this zone, learning is most effective when the learner is working to understand knowledge and skills just beyond their current level of understanding. Through collaboration and social interaction with the MKO, the gradual learning process, also known as Scaffolding, enables learners to progress from receiving support and guidance toward achieving independent mastery (Vygotsky, 1978). Vygotsky believed that social interaction fosters higher-order thinking and independent problem-solving skills (Vygotsky & Cole, 1978).

Both Montessori and Vygotsky were constructivists who believed that children construct their knowledge and do not simply mimic behavior (Bodrova, 2003). Montessori's education theory was founded on scientific observations of children's learning (Montessori, M., & Claremont, C. A., 1967). The Montessori method emphasizes self-directed, individual learning in a constructivist learning environment, where students are active learners in a learner-centered classroom (Wibowo et al., 2025). Vygotsky focused on children's development and how social interactions help construct their development.

Dr. Maria Montessori and Lev Vygotsky were proponents of active and student-centered learning (Leuwol et al., 2023). Montessori's theory of development outlines four planes of development from birth to adulthood. The second stage is childhood, which spans the ages of six to twelve. Children in this stage develop abstract thinking, imagination, morality, and a sense of justice (Montessori, M., & Claremont, C. A., 1967). They also begin to develop a global perspective and focus on social interaction with their peers (Montessori, M., & Claremont, C. A., 1967). Montessori's method emphasized the benefits of mixed-age learning environments for social development and learning (Montessori, M., & Claremont, C. A., 1967). The Montessori method of multi-aged classrooms aligns with Vygotsky's theory of the Zone of Proximal Development (ZPD). The older or more advanced students often help the younger ones, acting as the MKO (Leuwol et al., 2023).

Positive social interactions between students, peers, and teachers have a positive impact on their social-emotional development (Chan et al., 2025). Supportive interpersonal relationships between students and school staff help students with ADHD stay behaviorally engaged (Fredrick et al., 2022). Recent studies have shown that a positive school climate and respect for students can help mitigate ADHD-related difficulties (Chan et al., 2025). The social interactions between the learner and their environment play a crucial role in their learning and development (Wibowo et al., 2025).

Definition of Key Terms

The following definitions are key terms used throughout the research and are important for understanding their context within the project.

Attention Deficit Hyperactivity Disorder (ADHD): a neurodevelopmental disorder that can be exhibited in a child as mostly inattentiveness, mostly hyperactive-impulsive, or a combination of both types of symptoms, and occasionally as cognition and social differences (Centers for Disease Control and Prevention, n.d.)

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

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, 2013).

Neurodivergent: having or relating to a disorder or condition (such as autism spectrum disorder, attention deficit hyperactivity disorder, dyslexia, or obsessive-compulsive disorder) that impacts how the brain processes information: exhibiting or characteristic of variations in typical neurological development.

Social-emotional development: Social-Emotional Development: The gradual, integrative process through which children acquire the capacity to understand experienceexpress, and manage emotions and to develop meaningful relationships with others (Cohen et. al., 2005).

Traditional school: This is a conventional education model where teacher's direct students through a preset curriculum in a structured setting (Traditional, 2023)

Summary

With Attention Deficit Hyperactivity Disorder affecting 11.4% of children in the United States, children between 3 and 17 years old, it is important to understand the best practices and environments to support these learners. (Centers for Disease Control and Prevention, n.d.). Elementary-aged students with ADHD struggle with behavioral problems and learning difficulties in the school environment that impact their social-emotional development (Christoffersen, 2023; Shaw, 2022). For children with ADHD, self-regulation and motivation in school can be difficult to achieve due to inattention, hyperactivity, and impulsive behaviors (Staff et al., 2023). Parents of students with neurodevelopmental disorders, such as ADHD, often look for alternatives to the traditional learning environment. This project aims to further the understanding of Montessori Education, its practices in supporting students with ADHD, and the effects of the Montessori method of learning on the social-emotional development of elementary students with ADHD.

Chapter 2 will explore the history of Dr. Montessori and the Montessori Method. It will specifically focus on the unique challenges faced by elementary-aged students with ADHD and how those challenges impact their social-emotional development. By examining the core tenets of Montessori education, including multi-age classrooms, freedom of choice, self-regulation, and the importance of teacher-student relationships, we can gain insight into how this educational approach caters to the needs of students with ADHD. Additionally, we will review school-based accommodations and compare the effectiveness of Montessori education against traditional educational methods in supporting the overall development of these students. This exploration aims to highlight the potential benefits of Montessori education for elementary students with ADHD.

Chapter 2: Review of Related Literature
Introduction

Attention-Deficit Hyperactivity Disorder (ADHD) is one of the most common childhood disorders, affecting 11.4% of children between the ages of 3 and 17 in the United States (Centers for Disease Control and Prevention, n.d.). Defined by the American Psychiatric Association (2013) as a neurodevelopmental disorder, ADHD is characterized by persistent patterns of inattention and/or hyperactivity-impulsivity that interfere with a child's functioning or development. Elementary-aged students with ADHD often face behavioral problems and learning difficulties within the school setting, which can negatively impact their social-emotional development (Christoffersen, 2023; Shaw, 2022).

Teachers' rejection of ADHD students can affect how peers perceive them, and this can lead to rejection, low self-esteem, and the inability to establish a sense of belonging (Ewe, 2019; Harpin et al., 2016). A study by Ewe (2019) found that students with ADHD perceived school expectations as challenging, such as paying attention, remaining focused, completing tasks, and being organized. The literature indicates that many parents of children with special needs and ADHD often enroll them in Montessori schools (Long et al., 2022; Swiss & Chandramouli, 2024).

Montessori education, with its emphasis on student autonomy and individual exploration, has become a popular alternative to traditional education among parents seeking different approaches to learning (Fleming & Culclasure, 2024; Esi, 2024; Hiles, 2018). The Montessori method is a child-centered pedagogy that supports learners at different developmental stages (Montessori, M., & Claremont, C. A., 1967). Montessori education is linked to students' intrinsic motivation, academic achievement, and social-emotional well-being (Basargekar & Lillard,2023). Montessori believed that the teacher's role was to be an observer.

This project will investigate the social-emotional challenges and needs of elementary students with ADHD and determine whether the Montessori

method effectively addresses these needs. Additionally, understanding the impact of the Montessori method of education on the social-emotional development of students with ADHD can help families determine the most suitable learning environments for their child's unique needs.

History of the Montessori Method

Maria Montessori, a physician and educator, developed an educational approach based on her observations and deep respect for children (Lillard, 1972). Her method focuses on the child's absorption of information from their environment and their intrinsic motivation to become independent (Montessori & Claremont, 1967). Children in mixed-age classrooms engage with peers of different ages, fostering the development of social skills, empathy, and a strong sense of community (Montessori, M., & Claremont, C. A., 1967). Freedom of choice is central to the Montessori Method, enabling children to select work based on their interests and abilities. Choice encourages motivation, independence, and deep engagement with the learning process. In Montessori's book, The Discovery of the Child (1967), she stated "If teaching is to be effective with young children, it must assist them to advance on the way to independence" (p. 57).

Founder-Dr. Maria Montessori

Maria Montessori was born in Chiaravalle, Italy, in 1870 (Lillard, 1972). Her educated mother valued her education and wanted her to have a teaching career, the only career available to women at the time (Association Montessori Internationale, 2021). Montessori was not interested in the traditional route for women. At the age of 13, she attended a technical school for boys, where she developed an interest in mathematics and engineering (Standing, 1998). After being initially rejected, she attended the University of Rome Medical School and became the first female in Italy to earn a doctorate in 1896 (Lillard, 1972). Dr. Montessori first worked with children in the university's psychiatric clinic. She believed that children with developmental disabilities or intellectual disabilities would benefit from special education (Lillard, 1972).

Dr. Montessori's focus shifted from psychiatry to education. In 1898, she was the director of the State Orthophrenic School, where she worked with children and began to develop the foundation of her educational methods based on her observations (5Montessori & Claremont, 1967; Standing, 1998). She contributed a philosophy of how children learn and a comprehensive educational method to support that learning (Lillard, 1972). In 1907, Dr. Montessori opened the First Children's House (Casa dei Bambini) in San Lorenzo, Rome, for children from underserved backgrounds (Biography of Maria Montessori, n.d.). The school was a success, and by 1909, Montessori schools were open on five continents, with the first United States Montessori school opening in 1911. Montessori traveled the world, lecturing, training teachers, establishing schools, and writing. Montessori's book, The Montessori Method, was translated into 10 languages in three years (AMS, n.d.).

The Montessori Method

The three main elements of the Montessori Method are (a) the environment, including the materials, (b) the teacher who prepares it and (c) the child (Lillard, 1972; Lillard & McHugh, 2019). Dr. Montessori wrote that a teacher's role was to guide and facilitate the children's learning (Montessori, 2016). Beagle (2024) stated, "A Montessori classroom should run on self-regulation, personal responsibility, and social harmony—not adult-imposed rules" (p. 29). She believed that the teacher's role was to create a carefully prepared classroom environment and then act as an observer of the children. Through observation, the teacher can assess a student's needs.

A prepared teacher must have patience and refrain from trying to control behavior or interrupt developmental work; instead, they create a prepared environment where children can practice executive functioning skills, such as time management and self-regulation (Beagle, 2024). Dr. Montessori believed children should be prepared for real-life situations involving interaction with people of different ages and backgrounds (AMS, n.d.). According to the Montessori method, children learn through observation and peer interaction rather than being confined to age-based groups (Montessori, M., & Claremont, C., 1967).

Planes of Development

Age groups follow the four Planes of Development defined by Dr. Maria Montessori. Each plane of development lasts six years and aligns with a specific phase of a child's growth, each with distinct physical, emotional, and cognitive needs. Montessori education adapts to meet the needs and learning preferences of children at each stage. The first plane of development, also known as the absorbent mind, is from birth to 6 years of age, a period of rapid physical, emotional, and psychological growth. It is a time when children effortlessly absorb information from their environment. The second plane is from six to 12 years and is a time of mental independence. It is a sensitive period for peer interaction, imagination, social order, morality, and ethics. The third plane is the transition from childhood to adolescence, spanning from 12 to 18 years. It is a time of self-assessment, social independence, and consciousness, as well as the construction of both social and moral identities. The fourth plane is the transition from adolescence to adulthood, occurring between the ages of 18 and 24. It is characterized by the development of spiritual and moral independence, the establishment of one's place in society, and the pursuit of economic independence (Montessori, M., & Claremont, C., 1967)

Multi-age and Multi-level

Montessori classrooms are multi-age and grouped in three-year cycles. Multi-level classrooms allow older children to develop leadership skills, reinforce their learning by teaching concepts they have mastered, and serve as role models (Montessori, M., & Claremont, C. A., 1967). Older children become enforcers of social norms within their classroom community, while younger children learn from older children through observation (Lillard, 1972). Each

child's work is individualized, and they progress at their own pace with a wide range of materials and resources. There is cooperation rather than competition among the ages. Children learn valuable social skills by living together in a supportive social environment (Beagle, 2024). Children spend three years in each class, allowing them to develop long-term relationships with peers and the teacher. Mixed-age classrooms enable children to interact with peers of varying ages, promoting social skills, empathy, and a sense of community (Montessori, M., & Claremont, C. A., 1967).

Freedom of Choice

Dr. Montessori believed that children are naturally drawn to learning and developing their abilities (Montessori, M., & Claremont, C. A., 1967). In her book, The Discovery of the Child, she supported this concept by stating that children are best served by having choices and freedom within a structured and prepared environment (Montessori, 1967). Students are taught to take ownership and responsibility for the classroom environment by overseeing the daily care of materials, plants, and animals (Lillard, 1972). Montessori wrote that teachers should allow students freedom in their social interactions to foster cooperation and empathy among them (Montessori, 1967). Freedom was something that Montessori often spoke of. She believed that children could not be free without independence. Freedom in the classroom allows children to reveal their true selves, which in turn enables teachers to observe their needs (Lillard, 1972; Montessori, 1967).

Montessori and Vygotsky: Constructivists

Dr. Maria Montessori and Lev Vygotsky were constructivists who advocated active, student-centered approaches to learning (Leuwol et al., 2023). Vygotsky highlighted the importance of children's developmental processes and emphasized the critical role of social interaction in shaping cognitive growth. Vygotsky, a psychologist, developed the Zone of Proximal Development (ZPD) concept, which is the difference between what a student can do independently and what they can achieve with the guidance of an MKO, such as a teacher or peer (Vygotsky & Cole, 1978). In constructivist learning, students become the center and are free to develop their potential, with the teacher acting as a facilitator (Wibowo et al., 2025). Montessori and Vygotsky were constructivists who believed that children construct their knowledge and do not simply mimic behavior (Bodrova, 2003).

Understanding Attention-Deficit Hyperactivity Disorder (ADHD)

The Diagnostic and Statistical Manual for Mental Disorders (DSM-5) is used to assess and identify symptoms of ADHD (Shaw, 2022). The DSM-5 defines ADHD as a neurodevelopmental disorder characterized by persistent patterns of inattention and/or hyperactivity-impulsivity that interfere with functioning or development. Attention-Deficit Hyperactivity Disorder (ADHD) is one of the most common childhood disorders, affecting 11.4% of children between 3 and 17 years old in the United States (Centers for Disease Control and Prevention, n.d.). There are three types of ADHD:

inattentive, hyperactive-impulsive, and combined. Individuals with inattentive ADHD typically experience symptoms of (a) inattention, (b) difficulty focusing, (c) maintaining organization, and (d) following instructions. Individuals with hyperactivity-impulsive ADHD typically experience symptoms of hyperactive behavior, such as excessive restlessness and impulsive behaviors, such as controlling actions and words (American Psychiatric Association, 2013).

Challenges

Students with ADHD face challenges related to (a) attention, (b) focus, (c) hyperactivity, (d) impulsiveness, and (e) emotional regulation. These difficulties can hinder their academic success, particularly when they must concentrate on subjects that may not engage their interest (Basargekar & Lillard, 2023; Staff et al., 2023). The demands placed on students with ADHD in a school setting tend to exacerbate their inattentive, hyperactive, and impulsive behaviors (Staff et al., 2023). Children with ADHD often struggle to remain still in the classroom and exhibit a frequent need for movement, as they are unable to sit for extended periods. This behavior can lead to disruptions that negatively impact the learning environment (Kofler et al., 2020). Frequent individual seatwork and group lessons require self-regulation and motivation from students who struggle with executive functions (Staff et al., 2023).

Social-Emotional Development in Students with ADHD

Students with ADHD experience (a) low self-esteem, (b) loneliness, (c) suicidal ideation, (d) PTSD symptoms, (e) behavioral issues, (f) terminal behavior, (g) peer difficulties, and (h) substance abuse when their symptoms are left untreated (Christofferson, 2023). Elementary-aged students with ADHD struggle with behavioral problems and learning difficulties in the school environment that impact their social-emotional development (Christoffersen, 2023; Shaw, 2022). In the classroom, children with ADHD often struggle with social skills such as forming and keeping friendships, (b) coping with peer pressure, and (c) being more susceptible to peer rejection (Berchiatti et al., 2022; Kofler et al., 2020; Shaw, 2022).

Children with ADHD often struggle to form and maintain reciprocal friendships, a key aspect of peer relationships (Cordier et al., 2023). They may face peer rejection and struggle to read social cues. Their behavior can sometimes come across as controlling, disruptive, or aggressive, which is often viewed negatively by their peers (Bolinger et al., 2020). A study by McDougal et al. (2023) found that children had difficulty making friends and were often bullied. These children often face challenges such as psychosocial difficulties, feeling excluded from peer groups, and difficulty forming a stable sense of self, particularly during their teenage years (Berchiatti et al., 2022)

Relationships and Self-Regulation

Children with ADHD who struggle with relationships at school are at increased risk of developing mental health issues such as anxiety and depression (Christofferson, 2023; Shaw, 2022). A study by Harris-Lane et al. (2021) found that children diagnosed with ADHD scored significantly lower on posi-

tive mental health than children without ADHD. Social support, specifically in the form of social integration and reassurance of worth, may play an important role in the mental health of diagnosed youth (Harris-Lane et al., 2021). A strong, positive, and supportive relationship with a teacher has been shown to impact learning outcomes positively, (b) enhance peer relationships within the classroom, (c) boost self-esteem, and (d) influence students' emotions over time (Berchiatti et al., 2020; Goetz et al., 2021).

Demands such as individual seat work and group lessons require self-regulation that students with ADHD often struggle to fulfill (McDougal et al., 2023; Staff et al., 2023). Students who struggle with passive engagement often find it challenging to regulate their behaviors appropriately in the classroom, which can lead to distractions through off-task activities. This type of distraction can create conflict with teachers and impact on the emotional closeness and cooperation that are essential between teachers and students (Ewe, 2019). Minimizing conflict with teachers allows students with ADHD to develop a stronger emotional connection to their school environment, which subsequently enhances their academic success, social relationships, and long-term outcomes (Rushton et al., 2020).

Teacher Training

Two recent studies stated that teachers' knowledge, training, and professional development regarding ADHD were low (Joslof, 2024; Bolinger et al., 2020. Research has shown that teacher training on supporting students with ADHD can influence the attitudes and practices of teachers, enabling them to address the unique needs of these students better (Bolinger et al., 2020; Moss & Wheeler, 2024). A study by Long et al. (2022) reported that school administrators believed their Montessori teachers could support students with special needs; however, they believed that additional professional development training would help foster more equitable teaching practices. Research by Ward et al. (2020) found that training helped teachers' assumptions and attitudes towards students with ADHD, but did not affect student behavioral outcomes.

School-based Accommodations

All students are protected under the Individuals with Disabilities Education Act (IDEA), a federal law that guarantees Free and Appropriate Public Education (FAPE) to students with disabilities (United States Department of Education Office for Civil Rights, 2016). A recent study found that 69.3% of students with ADHD have one or more types of school services and interventions to support academic and behavioral needs (DuPaul et al., 2022). Most students with a medical diagnosis of ADHD are typically eligible for accommodations under Section 504 of the Americans with Disabilities Act (United States Department of Education Office for Civil Rights, 2016). These accommodations may include support such as (a) extended time on assessments, (b) preferential seating in the classroom, and (c) customized behavior intervention strategies. However, they do not include traditional special education services. Schools are required to assess whether a student has a disability that signifi-

cantly impacts a major life activity, such as learning. If eligibility is confirmed, a collaborative team consisting of parents, educators, and other professionals works together to develop an individualized 504 plan.

Research indicates that classroom accommodations can support students with ADHD (Classroom Accommodations, n.d.; Duce, 2023; McDougal et al., 2023). Establishing and practicing clear rules and procedures for classroom tasks with students can help support the development of appropriate behaviors. Furthermore, pharmacologic treatment is effective in reducing ADHD symptoms, although its effects are rarely sufficient in addressing the many academic and social difficulties experienced by children with ADHD (Mechler et al.,2022).

Physical Environment

Teachers should consider the physical environment of the classroom when minimizing distractions, such as classroom displays. Seating students in individual desks in places with fewer distractions, near the teacher or peer who is less likely to disturb them, will help inattentive students. Frequent movement breaks and fidgets help support hyperactive students. Positive feedback reinforces desired behaviors while providing opportunities for students with ADHD to be viewed in a positive light by their peers, which can help them feel connected to their classroom. Providing corrective feedback in a private, one-on-one setting will preserve the student's self-esteem and foster trust between the teacher and the student. These accommodations help support students with ADHD in accessing their education (Classroom Accommodations, n.d.; Duce, 2023; McDougal et al., 2023).

Positive Climate

A positive school climate and a fair but strict disciplinary structure are the most consistent predictors of adaptive outcomes, protecting against risk, fewer internalizing symptoms, and emotional dysregulation in students with ADHD (Chan et al., 2025). Interventions, such as social skills groups and play interactions between children with ADHD and their peers, can have positive impacts on social development and foster more meaningful friendships (Cordier et al., 2023). A school culture that prioritizes respect for students and fosters positive relationships between students and teachers was the most significant predictor of positive outcomes in students with ADHD (Chan et al., 2025).

Effects of Montessori and Traditional Education and Compatibility with ADHD

Montessori schools have a higher proportion of students with special needs than public schools (Swiss & Chandramouli, 2024). They found that many evidence-based practices (EBPs) in special education align with the training Montessori teachers receive, and the Montessori method already incorporates the needs of students with ADHD (Swiss & Chandramouli, 2024). For example, Dr. Montessori wrote about the importance of following the child (Montessori,1967). Josloff (2024) argues that this core concept of the

Montessori method is key in supporting the needs of students with ADHD.

Montessori classrooms, often referred to as prepared environments, are designed to provide children with the freedom to choose their activities and direct their learning (Montessori & Claremont, 1967). The child is at the center of the educational experience, and the teacher's role shifts significantly from that in traditional schools, shaping the way communication and collaboration occur between teacher and student (Bavli & Uslu Kocabas, 2022).

Neurosequential Model in Education

A study by Dr. Perry, known as the Neurosequential Model in Education (NME), aligns closely with Dr. Maria Montessori's educational method (Phillips, 2022). The study shows that both approaches share many similarities. Perry's six R's (a) relational, (b) rhythmic, (c) repetitive, (d) relevant, (e) rewarding, and (f) respectful are also reflected in Montessori's writings. Modern research in psychology suggests the Montessori method is more suited to how children learn and develop than the traditional system (Lillard, 2017, as cited in Phillips, 2022). Similarly, Basargekar & Lillard (2023) found that Montessori education is linked to (a) students' intrinsic motivation, (b) academic achievement, and (c) social-emotional well-being.

Montessori methodologies train and encourage teachers to observe students and reflect on those observations, thereby fostering a deeper understanding of their students' diverse needs and learning styles. Teachers' observations help inform teaching practices that (a) support learning, (b) create effective classroom routines, and (c) foster relationships that ultimately improve the quality of their teaching (Gerker, 2024). Moreover, behavioral interventions and educational accommodations can be effectively implemented in a Montessori environment because these practices are already embedded within it. (Esi, 2024).

Traditional Education Model

The traditional education system is often based on face-to-face teaching, rigid structure, and standardized assessments (Rao et al., 2015, as cited in Esi, 2024). For children with ADHD, this environment can be problematic because it does not offer them enough flexibility, and it does not respond to their individual needs for learning and behavior regulation. At the turn of the 20th century, two core ideas took hold in American education: viewing schools as factories and children as blank slates. While modern child development research has shown these concepts to be outdated, they still strongly influence current educational practices (Lillard, 2017).

Montessori vs Traditional Model

A comparison between the Montessori and traditional education model was measured in terms of (a) cognitive, (b) socio-emotional, and (c) academic achievement in elementary-aged students (Mutmainna et al., 2024). The results showed that students from Montessori schools outperformed those from traditionally educated schools. While Montessori students showed higher levels of (a) social competence, (b) empathy, and (c) behavioral self-control,

the results found that students from traditional school settings were better prepared for structured learning and standard assessments (Mutmainna et al., 2024). A study by Esi (2024) found that parents and students with ADHD who attended Montessori schools reported more positive social interactions and better classroom behavior and adaptation to the school environment than those in traditional school settings. When compared to students in traditional school settings, Montessori students outperformed in academics and creativity (Denervaud et al., 2019).

Autonomous learning

Research conducted by Moss and Wheeler (2024) found that both traditional and Montessori teachers believe that autonomous learning is beneficial to students and that controlling, although easier to implement, is less effective. Both groups reported practicing Ryan and Deci's (2000) Self-determination Theory in their classrooms. This theory believes that human motivation is driven by three fundamental psychological needs: autonomy, competence, and relatedness (Ryan & Deci, 2000). According to data, the traditional teachers were found to be more controlling of their students' learning.

Similarly, a study by Denervaud et al. (2019) found that Montessori students outperformed in academics and creativity. No differences were found in executive functioning skills except working memory. The results also showed that the success of students may be attributed to a self-directed creative environment. Students who attended Montessori schools were associated with positive outcomes in intrinsic motivation, academic engagement, and social cohesion (Basargekar & Lillard, 2023).

Motivational Factors

Theories of motivational factors were studied and compared to include (a) autonomy, (b) interest, (c) competence, and (d) relatedness (Murray, 2011). He compared the characteristics of these theories to Montessori practice. Montessori's method facilitates an environment that fosters a love of learning, where students can control their learning and have uninterrupted work time. The nature of the curriculum and materials, along with the multi-age-level classroom, supports students' interests, competence, and relatedness, which in turn supports students with ADHD (Murray, 2011).

Principles of Montessori

Many principles of the Montessori method align with the needs of students with ADHD. Lillard (2017) writes about the principles of Montessori education. A key principle is the interplay between movement and cognition. Learning by moving and doing is essential for all humans, and perhaps even more so for children with ADHD, who have a strong need for movement (Kofler et al., 2020). Choice and control are what drive independence. In Montessori classrooms, students have more independence and individualized learning than in traditional school settings (Basargekar & Lillard, 2023; Staff et al., 2023). Learning from peers in a multi-age classroom enables children to learn from a more knowledgeable other (MKO) (Bodrova, 2003). Students

with ADHD can receive support in their learning and development by receiving guidance, scaffolding, and encouragement from the MKO. Prepared Montessori classrooms are environments that are both physically and conceptually organized, providing predictability and reducing anxiety, which helps children manage their symptoms more effectively (Basargekar & Lillard, 2021).

Alternative Practices

A study by Guerrero et al. (2024) analyzed alternative educational practices, such as Montessori, and found that students attending these schools either outperform their peers in conventional schools or demonstrate comparable performance levels. Some studies indicate that students in alternative school settings tend to score lower in math and exhibit lower creativity compared to their counterparts. For example, Guerrero (2024) found that there is an assumption that alternative schools are beneficial for child development, but the research does not support this. Guerrero et. al. (2024) state that "Future research needs to focus on these aspects, making it possible to examine the assumption that school settings in which children's developmental needs are the epicenter of educational practice foster harmonious social cognitive, emotional, and personal development" (p. 12).

Summary

In Chapter 2, the researcher explored the history of Dr. Montessori and her child-centered education method. The foundational principles of the Montessori method included (a) Planes of Development, (b) importance of freedom of choice, (c) the multi-age classroom, (d) self-regulation, and (e) student-teacher relationships. Understanding the unique challenges that elementary-aged students with attention deficit hyperactivity disorder (ADHD) face and how those struggles affect their social-emotional development in the school setting was explored. Chapter 2 also reviewed school-based accommodations for students with ADHD and the critical role teacher training plays in understanding the needs of their students with ADHD, thereby helping to foster positive relationships between students and teachers. The importance of a prepared learning environment and a positive social climate for students was examined. The physical and positive environments were discussed.

The impact of Montessori education versus traditional education and their compatibility with the needs of students with ADHD was investigated. The Neurosequential Model in education was examined along with the Principles of Montessori and Alternative practices. Autonomous learning and motivational factors were also explored. The research found in Chapter 2 can be synthesized to support the idea that Montessori education is an effective learning method for elementary students with ADHD.

Students with ADHD struggle with social-emotional development in schools. The research in this chapter demonstrated that the Montessori method incorporates numerous accommodations for students with ADHD within its pedagogy. In Chapter 3, the author will examine the findings of this re-

search and present the practice and policy implications of implementing the Montessori method in districts across the state and country, with a focus on supporting all students, including those with ADHD. The author will all discuss why directions for future studies on Montessori education are necessary and address any existing gaps in the research.

Chapter 3: Implications
Introduction

The research in this project focused on the most common childhood disorder in the United States, Attention-Deficit Hyperactivity Disorder (Centers for Disease Control and Prevention, n.d.). The research showed that elementary-aged students with ADHD struggle with behavioral problems and learning difficulties in the school environment that impact their social-emotional development (Christoffersen, 2023; Shaw, 2022). Teacher knowledge and training, along with the school environment, impact the success of students with ADHD.

Montessori education, with its child-centered pedagogy, has become a popular alternative to traditional education among parents seeking different approaches to learning (Fleming & Culclasure, 2024; Esi, 2024; Hiles, 2018). The purpose of this project is to examine the effects of the Montessori teaching methods of the social-emotional development of students with ADHD. This project also aimed to answer the research question of whether the Montessori Method had a positive impact on the social-emotional development of elementary students diagnosed with ADHD.

Conclusions

The research showed the social-emotional challenges that students with ADHD often struggle with in school. The struggle to self-regulate and stay motivated in school can be challenging due to (a) inattention, (b) hyperactivity and (c) impulsive behaviors often resulting in difficulties forming and maintaining reciprocal friendships (DuPaul et al., 2022; Staff et al., 2023; Cordier et al., 2023). According to a study by Ewe (2019), students with ADHD often view school expectations as challenging such as (a) paying attention, (b) remaining focused, (c) completing tasks and (d) being organized. Children with ADHD often struggle to remain still in the classroom and exhibit a frequent need for movement, as they are unable to sit for extended periods. This behavior can lead to disruptions that negatively impact the learning environment (Kofler et al., 2020). Moreover, the traditional education system is often based on (a) face-to-face teaching, (b) rigid structure and (c) standardized assessments (Rao et al., 2015, as cited in Esi, 2024). For children with ADHD, this environment can be problematic because it does not offer them enough flexibility, and it does not respond to their individual needs for learning and behavior regulation.

Secondly, the literature suggests that the Montessori method aligns more closely with how children naturally learn and develop when compared

to traditional education (Lillard, 2017, as cited in Phillips, 2022). In Montessori classrooms, students have more independence and individualized learning than in traditional school settings (Basargekar & Lillard, 2023; Staff et al., 2023). The Montessori child-centered and self-directed curriculum focuses on student autonomy and individual exploration, which has made Montessori schools one of the main choices over traditional education among parents (Fleming & Culclasure, 2024; Esi, 2024; Hiles, 2018). Students who attended Montessori schools were associated with (a) positive outcomes in intrinsic motivation, (b) academic engagement and (c) social-emotional well-being (Basargekar & Lillard, 2023).

Furthermore, a study by Esi (2024) found that parents and students with ADHD who attended Montessori schools reported more positive social interactions and better classroom behavior and adaptation to the school environment than those in traditional school settings. A study by Mutmainna et al. (2024) found that Montessori students, compared to those from traditional school settings, exhibited higher levels of social competence, empathy, and behavioral self-control. Children learn valuable social skills by working together in a mixed-aged classroom with the same teacher for three years. The interaction with peers of varying ages promotes social skills, empathy, and a sense of community (Beagle, 2024; Montessori & Claremont, 1967). When compared to the traditional school model, the Montessori method already has accommodations embedded within to support the social-emotional needs of students with ADHD.

Thirdly, the project aimed to find if the Montessori Method had a positive impact on the social-emotional development of elementary students diagnosed with ADHD. The Montessori method supports the social-emotional needs of students with ADHD by incorporating core tenets such as multi-age classrooms, freedom of choice, self-regulation, and the importance of teacher-student relationships (Josloff, 2024). Swiss & Chandramouli (2024) found that many evidence-based practices (EBPs) in special education align with the training Montessori teachers receive, and the Montessori method already incorporates the needs of students with ADHD. Freedom of choice is central to the Montessori Method, enabling children to select work based on their interests and abilities. Choice encourages motivation, independence, and deep engagement with the learning process. Moreover, behavioral interventions and educational accommodations can be effectively implemented in a Montessori environment because these practices are already embedded within it. (Esi, 2024).

Fourth and final, the research found that the Montessori method creates an environment that fosters a love of learning, allowing students to control their learning and have uninterrupted work time. The nature of the curriculum and materials, along with the multi-age-level classroom, supports students' interests, competence, and relatedness, which in turn supports students with ADHD (Murray, 2011). Prepared Montessori classrooms are environments

that are both physically and conceptually organized, providing predictability and reducing anxiety, which helps children manage their symptoms more effectively (Basargekar & Lillard, 2021). Working with peers in a multi-age classroom allows students with ADHD to receive guidance, scaffolding, and encouragement from a more knowledgeable other (MKO) (Bodrova, 2003). The Montessori philosophy, which prioritizes respect for students and fosters positive relationships between students and teachers, was found to be one of the most significant predictors of positive outcomes in students with ADHD (Chan et al., 2025).

Practice Implications

The present research highlighted the significance of positive relationships between students and teachers in promoting the mental health of students with ADHD (Berchiatti et al., 2020; Goetz et al., 2021). The struggles that affect students with ADHD have a significant impact on the classroom environment, and teachers' knowledge and understanding of these specific challenges are essential for the success of these students. Students with ADHD are at risk for social-emotional and psychosocial difficulties (Berchiatti et al., 2022).

One practical implication would be to implement professional development for ADHD that can support educators with the challenges that come with educating students with ADHD. Knowledge of this disorder can help eliminate misconceptions and help teachers create an equitable and safe learning environment for students with ADHD. While understanding is important, it is equally necessary for training to address practical needs in the classroom.

With ADHD affecting one in every ten students, the importance of teacher knowledge and training on ADHD seems logical. However, the research revealed a lack of training and professional development related to ADHD among educators (Joslof, 2024; Bolinger et al., 2020). Teachers' assumptions and attitudes towards students with ADHD helped with relationships but did not affect student behavioral outcomes (Ward et al., 2020). Even teachers who understood the neurological condition felt that they could benefit from additional training (Long et al., 2022).

A second practical implication would be to implement training of Montessori teachers, including those offered by (a) the American Montessori Society (AMS), (b) the Association Montessori Internationale (AMI), (c) the International Montessori Council, and (d) the Montessori Educational Programs International (Moss & Wheeler, 2024). The training that a teacher receives can impact their attitude and classroom practices. The Montessori method does require children to be self-directed, which can be a challenge for students with ADHD. Although Montessori training is inclusive to neurodivergent children in theory, there are some biases among Montessori educators that they may not be aware of (Shaw & Baker, 2024). Furthermore, it is essential that all teachers, including Montessori teachers, critically examine their own beliefs and biases about how neurodivergent students can thrive in the

classroom with the right support.

Policy Implications

With such a significant portion of the student population affected by ADHD, it is essential to examine the policies and environment that are most conducive to these students' learning. All students with special needs, including those with ADHD, are protected under IDEA. All students have the right to a free and appropriate education (United States Department of Education Office for Civil Rights, 2016). However, while some students with ADHD qualify for an Individual Education Plan (IEP), many do not. Most students with a diagnosis of ADHD are eligible for accommodations under Section 504 of the Americans with Disabilities Act. Accommodations, such as preferential seating in the classroom and customized behavior intervention strategies, are crucial. The demands placed on students with ADHD in a school setting tend to exacerbate their inattentive, hyperactive, and impulsive behaviors (Staff et al., 2023). One policy implication would be to ensure all ADHD students qualify for an IEP, not just some. This can be done by collaborating with education policymakers to amend Section 504 of the U.S. Department of Education Office for Civil Rights (2016).

Parents are seeking alternatives to traditional schools, with Montessori schools becoming a popular choice (Fleming & Culclasure, 2024; Esi, 2024; Hiles, 2018). The literature shows that many evidence-based practices (EBPs) in special education align with the training Montessori teachers receive, and the Montessori method, with its child-centered approach, already incorporates the needs of students with ADHD (Swiss & Chandramouli, 2024). If the research shows that Montessori education helps support students with ADHD, then publicly funded schools should offer alternative pedagogies, such as Montessori, to support these students and their families. A second policy implication may be achieved by collaborating with parents, the community, and school board members at the district, state, and federal levels to develop a plan that would integrate Montessori schools into public-funded, qualified school districts. This may be achieved by working with the Public Charter Schools Grant Program, which provides technical assistance to both charter and non-charter schools (Public Charter Schools Grant Program, 2025).

Directions for Future Study

This study aimed to find the social-emotional effect of Montessori education on students with ADHD. What the research revealed is that more studies address the academic achievement of Montessori students than the social-emotional development of students with ADHD. When the research findings demonstrated the positive effects of the Montessori method on students in terms of (a) social competence, (b) empathy, and (c) self-control, they did not specifically address its effects on Montessori students with ADHD (Mutmainna et al., 2024). The limitations of this study suggest that future studies should focus on the Montessori method and its social-emotional impact on the development of elementary-aged students with ADHD, as the behavioral

aspects in the school environment significantly impact their social-emotional development. Many of the studies in this project were limited by their small sample size and the fidelity with which the Montessori method was implemented. Secondly, future studies would benefit from distinguishing between private Montessori schools and public sector Montessori schools (magnet schools) specifically, and how these programs support the strengths and needs of students with ADHD. There are differences in the implementation of the Montessori method between private Montessori schools and public schools that have adopted the Montessori curriculum. To further understand the effects of the Montessori method of education, future research would benefit from distinguishing between private and public.

Summary

Elementary-aged students with ADHD struggle with behavioral problems and learning difficulties in the school environment, which can significantly impact their social-emotional development. This literature review examined the effects of the Montessori teaching methods, their practices in supporting students with ADHD, and the effects of the Montessori method of learning on the social-emotional development of students with ADHD.

With ADHD impacting many children in the United States, it is important to understand the best practices and environments to support these learners. Self-regulation and motivation in school can be difficult for children with ADHD, due to inattention, hyperactivity, and impulsive behaviors. Parents of students with neurodevelopmental disorders, such as ADHD, often look for alternatives to the traditional learning environment. The literature revealed that Dr. Montessori's child-centered education method incorporates many accommodations for students with ADHD. The research revealed that the foundational principles of the Montessori method, including freedom of choice, the multi-age classroom, and the student-teacher relationship, make the Montessori education an effective learning method for elementary students with ADHD. School districts should offer schools that implement alternative pedagogies, such as Montessori, and support these schools within their districts to support students and their families who choose them.

Two policy implications that can support students with ADHD are to ensure that all students with ADHD qualify for an IEP and for community and school board members at the district, state, and federal levels to develop a plan that integrates Montessori schools into public-funded, qualified school districts. By policymakers modifying the qualifications for an IEP, students with ADHD will be guaranteed the supports needed, and by offering alternative schools, parents can find the appropriate learning environment for their children.

The literature shows that the Montessori method aligns more closely with how children naturally learn and develop compared to the traditional education model. This project found that the Montessori Method, with its child-centered focus, has a positive impact on the social-emotional develop-

ment of elementary students diagnosed with ADHD. The Montessori method empowers students to take control of their learning while creating an environment that fosters a love of learning.

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Graduation Rates: An Exploration of the Impact of Charter School Programs on the Acdemic Success of High School Students

Ardith Chavez

Abstract

This project examines the influence of charter high school attendance on student academic success, specifically whether charter schools genuinely support achievement or only divert critical funding from traditional public schools. The study focuses on comparing graduation rates between charter and traditional public schools by evaluating whether marginalized students experience greater success in charter schools and if charter school attendance increases motivation. Data from the 2023–2024 California school year reveals a significant disparity in five-year cohort graduation rates: charter schools at 73.3%, compared to 90.8% in traditional public schools. The graduation rate is based on a five-year cohort to account for the variance in transfers from other schools, a juvenile facility or emigration. Charter schools consistently show lower rates across all racial and ethnic groups. However, the literature review suggests that academic success for marginalized students is influenced more by positive teacher-student relationships and supportive learning experiences than by school type. Teachers supporting the development of self-efficacy in students play a crucial role in student motivation. Implications for practice recommend that teachers implement culturally responsive assignments to foster positive self-image and belonging. School administrators should prioritize community-building training that supports academic goals. Policy recommendations include increased state funding for professional development focusing on community building and culturally responsive curricula. These initiatives aim to create environments where students feel valued and capable of succeeding. Future research should include quantitative studies on socioeconomic factors like household income and parental education levels, explore non-urban populations, and incorporate qualitative methods, such as interviews with families, to better understand the motivations behind school choice.

Chapter 1: Introduction to the Project
Background

Students entering high school in the United States have multiple school choices. The most common choices are traditional K-12 public schools, which follow strict standardized curricula based on state guidelines to ensure a similar experience across the state. The other tuition-free public school option is charter schools. Charter schools began in 1988 when Albert Shanker, President of the American Federation of Teachers, proposed the idea of having teams of

teachers lead a school by developing innovative teaching solutions to support underserved students (National Charter School Resource Center, 2025). In California, charter schools are public schools established by parents, educators, or community members who submit a charter petition to their local school district. State law authorizes county boards of education to serve as chartering authorities, granting them the power to review and approve these petitions and granting the charter schools permission to operate under a legislative contract or charter (California Department of Education, 2024). Once approved, these schools must demonstrate academic success to renew their charter and stay in operation. Unlike traditional public schools, charter schools are not tied to standardized curricula but have the flexibility to choose their curricula through focusing on a central philosophy or educational framework instead of traditional public school guidelines in order to create a space for diverse student populations to thrive.

The establishment of charter schools has led to increased parental support, especially from families of ethnic minorities. Mullen (2024) explained how charter schools are being driven by parents who want more control over school curriculum, staffing, and boards. Furthermore, when these schools open in Black pro-school choice neighborhoods, they are met with large community support (Mullen 2024). This could be in part due to the continued history of segregation in schools, as Jang (2024) researched racial economic segregation based on geographic areas and the population of minority students in high-poverty schools. She found that between-district segregation has been the most prominent, and within-district segregation has increased the most in the past three decades (Jang, 2024). Charter schools offer students the opportunity to attend school outside of their home school district by creating greater diversity throughout districts. Monarrez et al. (2022) found that charter schools bring together students of color who may have been more widely dispersed in traditional public schools, thus leading to a greater concentration of students of color. For some students and families, the ability to find and engage with a school community that aligns with their family background can be a preferred option.

Although charter schools are in cities and suburbs, they tend to be in places with a higher concentration of students of color, such as urban cities like Los Angeles, California. Students of color residing in urban cities and attending charter schools do better academically than students residing in the same cities and attending traditional public schools. The Los Angeles communities were looking for ways to support their students, and charter schools became an ecosystem that benefits marginalized students. Reber et al. (2024) conducted a study on five Los Angeles charter high schools with a majority of high school students identified as low-income Black and Latino. They found that these students had higher standardized test scores and greater persistence at four-year universities than their traditional public school counterparts. These students were less likely to skip class, took more advanced classes, and

felt more supported to apply to university.

Students who feel supported in their educational environment are more likely to find the motivation to pursue academic success, and attending charter schools may be a factor (Reber et al., 2024). Motivation plays a vital role in determining academic achievement, as students must possess the drive to engage with the demanding nature of schoolwork. Learning is inherently an active and effortful process that requires sustained motivation to overcome challenges. Notably, extrinsic motivation is not an innate trait that some students possess while others do not; instead, it is shaped by external factors, such as the amount of support students receive from teachers and the degree to which students believe in their ability to succeed which can be defined as their level of self-efficacy (Bandura, 1978; Dighero et al., 2024). In essence, attending charter schools may benefit motivation because students have supportive educators around them, and their support boosts their self-efficacy (Noll, 2022; Reber et al., 2024).

Charter schools have experienced significant growth in the United States, with increasing numbers of students transferring from traditional public schools. According to the National Center for Education Statistics (2023), charter school enrollment grew from 1.8 million to 3.7 million students between 2010 and 2021, while enrollment in traditional public schools decreased from 47.4 million to 45.4 million students during the same period. This shift in enrollment suggests a growing preference for charter schools among parents and students (National Center for Education Statistics, 2023).

The growth of charter school enrollment has led to a decrease in enrollment for traditional public schools. As more students choose charter schools, public schools lose a portion of their state funding to charter schools. Since public schools rely on student attendance to secure state funding, the loss of students to charter schools can have a significant impact on the financial resources available to traditional schools. This reduction in funding often results in budget constraints, which can create challenges for administrators and educators (Knight & DeMatthews, 2024; Tobin, 2024).

Statement of the Problem

The increasing popularity of charter schools has sparked concerns among traditional public school educators and administrators who argue about whether these schools are genuinely supporting student success. They worry that these schools divert funding away from public schools and negatively affect enrolled traditional public school students (Knight & DeMatthews, 2024). This concern is often the argument against allowing more charter schools. While this concern is valid, the funding that supports charter schools to design curricula beyond state guidelines often results in higher academic achievement. In a longitudinal study, Raymond et al. (2023) found that students enrolled in charter schools, as opposed to their assigned traditional public schools, outperformed their peers and had the equivalent of six additional days in mathematics and 16 additional days in reading. This suggests that charter schools can

provide an educational experience that accelerates student achievement.

When traditional public schools advocate for the restriction or closure of new charter schools, they may hinder the potential for students to reach higher academic levels. Charter schools offer flexible curricula and alternative educational models that may better suit the diverse needs of students. Furthermore, they offer institutional cultures that may better support marginalized students (Dighero et al., 2024; Noll, 2022). In contrast to charter schools' curricular flexibility, traditional public schools often offer a broader range of core subjects. As David et al. (2020) found, public schools can offer a wider variety of subjects, such as both introductory and advanced college-level biology courses, allowing students to select classes that align with their academic preferences and interests.

While charter schools may provide a more rigorous academic structure, this does not always translate to better academic outcomes. For instance, graduation rates in California for the 2023–2024 school year show that non-charter high schools had a five-year cohort graduation rate of 90.8%, while charter high school students graduated at a rate of 73.3% (California Department of Education, 2024). This discrepancy raises important questions about the academic success of charter schools and whether their structural advantages consistently lead to superior student outcomes.

Purpose of the Project

The purpose of this study is to analyze the impact of charter high school attendance on the academic success of students. More than before, students and families have a greater selection of school choices (Tobin, 2024). Traditional public schools are only one of many options, and students and their families are realizing that traditional schools might not be the best choice for meeting their educational pursuits. Charter schools offer historically marginalized students one-on-one opportunities with more academic support, resulting in higher academic success rates (Reber et al., 2024).

Advocates of traditional public schools seek to limit the expansion of charter schools and argue that charter schools divert funding away from traditional schools (Mullen, 2024). Tobin (2024) explained that the financial pressures caused by charter schools force traditional public schools to expand their non-academic offerings, often at the expense of academic quality, to attract families and students. Traditional public schools emphasize academic achievement through clearly defined learning objectives. Academic success in these schools is defined by clear learning targets set by teachers, making it evident what students need to know and understand. Furthermore, students are encouraged to recognize the relevance of the material and its connection to their broader educational goals (Eagan, 2023). Whereas charter schools may accomplish these objectives, the mission of charter schools is to provide expanded learning opportunities and innovative teaching styles to students who have not found success in traditional public schools (California Department of Education, 2024; Raymond et al., 2023).

Although researchers have extensively examined the negative financial impact of charter school expansion on traditional public schools, there remains a notable gap in the literature concerning the original needs and purposes that charter schools were intended to address. Attending charter schools increases the likelihood of graduation and allows high school students to achieve greater academic success; therefore, limiting school expansion would be a detriment to the success of students. Three research questions will guide this proposed study:

1. What is the difference between charter high school graduation rates compared to traditional public schools?
2. Do marginalized high school students have greater academic success in charter schools versus traditional public schools?
3. Does attending a charter school lead to greater motivation in high school students?

Theoretical Framework of the Project

Self-Efficacy Theory is a framework for understanding the role of self-belief in academic success. This theory centers on the idea that individuals' belief in their ability to succeed in specific tasks is crucial to their achievement (Bandura, 1978). A person's self-efficacy is not stagnant but can improve through strategies such as therapy, mentorship, and positive self-talk. Self-efficacy refers to a person's perception of their abilities. When a person is encouraged and their self-belief is strengthened, they become more motivated, fueled by newfound confidence to pursue their goals. For example, a student may begin the school year with low self-efficacy, but with consistent support from their teacher, their belief in their ability to succeed can grow over time (Dighero et al., 2024). Once a student's self-perception improves, they have more extrinsic motivation to focus on academics and thus the ability to achieve greater academic success.

Bandura's research, particularly his famous study involving Bobo the Clown, serves as a cornerstone for understanding self-efficacy as part of his broader social learning theory (Bandura, 2008). In this experiment, participants were randomly placed in one of the two treatment groups or the control group. Participants in the first treatment group observed adults aggressively attacking Bobo the Clown, while participants in the second group watched adults manage their anger without aggression. The results revealed that the participants who observed aggressive behavior displayed significantly higher levels of aggression themselves, and participants who observed non-aggressive behavior showed less aggression. Participants in the control group did not observe either model and exhibited less aggression, similar to the participants in the second treatment group. This study led Bandura to further explore the impact of observational learning, self-development, and self-regulation, and how people learn behavior through observation. These insights ultimately contributed to the development of his broader social learning theory from which self-efficacy stems (Bandura, 2008).

Before Bandura's work, psychologists believed that humans were largely influenced by their environments and lacked control over their outcomes. Bandura's theory revolutionized this thinking and showed that individuals could achieve their goals by maintaining optimism even in the face of adversity. Self-Efficacy Theory, a subset of Bandura's social cognitive theory, focuses specifically on an individual's belief in their ability to accomplish a given task. It suggests that psychological techniques like therapy or motivational strategies such as positive self-talk can enhance this belief, thereby increasing one's self-efficacy (Bandura, 1978).

In the context of education, students frequently face challenges as they navigate new material and undergo significant personal development. School communities, including counselors and teachers, can play a vital role in supporting students' self-empowerment and fostering a positive self-identity (Brooms, 2021). A student's investment in their growth reflects their self-worth and resilience. Teachers, in particular, are instrumental in ensuring that students feel valued, supporting their educational aspirations, and helping them find purpose (Brooms, 2021). This aligns with Bandura's (1978) Self-Efficacy Theory, which reasons that overcoming the psychological barrier of self-doubt is critical for success. Thus, once a student has overcome their self-doubt, they are more motivated to pursue their goals and achieve success.

Furthermore, students' agentic engagement, or their desire to participate, is tied to the ability to receive and give support to their teachers while learning, as demonstrated in a study of charter high school students (Zambrano et al., 2022). The high school students in the charter physical science and engineering classes were more likely to engage actively in learning when teachers encouraged their ideas and supported their efforts. One student recalled how a teacher's openness to a project idea, which focused on the impact of urban development in their own community, boosted their enthusiasm and involvement (Zambrano et al., 2022). This example further emphasizes the relevance of Bandura's theory through demonstrating that educators can have a positive impact on the ambitions and engagement of students (Brooms, 2021; Zambrano et al., 2022).

There are charter schools that propose a new experimental way of teaching that often does not focus solely on test scores but rather on the whole student. Students from marginalized groups who already feel less valued and misunderstood by society benefit from these school communities. The role of a teacher is not only to educate students but also to enhance their self-efficacy and nurture their self-esteem, thereby contributing to greater life success beyond school (Ankrum, 2025; Dighero et al., 2024; Zambrano et al., 2022).

Definition of Key Terms

The exploration of the impact of charter school programs on the academic success of high school students concerns a few important key terms.

Academic Success: Academic success has six components: academic

achievement, satisfaction, acquisition of skills and competencies, persistence, attainment of learning objectives, and career success (York et al., 2015).

Extrinsic motivation: A person's drive to accomplish or perform a task impacted by external factors such as praise, rewards, or negative consequences (American Psychological Association, 2018).

Charter school: Charter public schools receive approval from a state entity and receive annual evaluation by their academic performance for renewal (National Charter School Resource Center, 2025).

Historically marginalized students: Historically marginalized students have historically been pushed to the edges of society and the economy due to factors such as their race, gender, or where they live, such as rural areas, townships, or low-income neighborhoods (Cross & Atinde, 2015).

Low income: The federal government determines whether or not an individual is low income by their family's taxable income for the previous year was not more than 150% of the set poverty level amount (U.S. Department of Education 2025).

Self-Efficacy Theory: A theory developed by Albert Bandura on a person's belief that they can accomplish a given task (Bandura,1978).

Summary

The number of students choosing charter schools has grown across the nation. Charter schools offer educational pathways that prepare high school students for postsecondary opportunities and future careers. These schools are an alternative route to earning a high school diploma, a credential that significantly impacts a student's financial and educational mobility (Schmidt, 2021). Many students report experiencing stronger support systems in charter schools, particularly from their teachers, which contributes to their increased likelihood of pursuing higher education (Reber et al., 2024).

However, the expansion of charter schools is not without controversy. Some district administrators express concern over the financial implications of charter growth, particularly the reallocation of public funds, as these schools become more prevalent in their communities (Knight & DeMatthews, 2024). Despite this, charter schools often arise in response to community advocacy, highlighting the need to assess their actual effectiveness (Mullen, 2024). Through the lens of Bandura's Self-Efficacy Theory, this study examines whether student success in charter schools is linked to increased self-belief (Bandura, 1978).

Chapter Two provides a comprehensive review of the literature related to the impact of charter schools on the academic success of high school students. The first section delves into a comparison between students attending charter schools and students in traditional public schools, with a focus on how each school setting influences academic outcomes. The second section examines the experiences of marginalized high school students within charter schools by highlighting how these environments support or hinder their academic progress. The final section explores the role of student motivation in

achieving academic success. Together, these sections frame the central themes of the study and offer critical insights into how charter schools shape the educational landscape in the United States.

Chapter 2: Review of Related Literature
Introduction

Public charter schools have grown exponentially in the United States since their inception in 1988 and have become a popular form of school choice, especially for students from historically marginalized communities. Charter school is a popular choice for historically marginalized communities as they are spaces where students receive support from adults in their respective communities. For instance, Ankrum (2025) found Black principals leading charter schools took the time to connect with their community and address institutional racism, historical injustices, and trauma experienced by Black communities. Charter schools are established as a result of parents and guardians advocating for high-quality education for their children (Tobin, 2024). Critics of charter schools, however, argue that they divert essential funding from traditional public schools and weaken the financial stability of public school districts (Knight & DeMatthews, 2024). Despite such criticisms, charter schools can offer students a significant degree of guidance and support, particularly during high school. Many students attending charter schools seek the kind of academic and emotional support they may not receive at home, especially when navigating the complexities of applying to postsecondary institutions. Noll (2022) studied a charter high school that developed individualized college plans for students, including financial strategies, to make higher education a realistic goal. Nonetheless, educators and school administrators remain divided on whether charter schools consistently produce the educational outcomes that proponents claim.

The purpose of this study is to explore the impact of charter schools on the academic success of high school students. This literature review has three sections. The first section provides an overview of charter versus traditional schools and the academic outcomes of their students. The second section focuses specifically on marginalized high school students and their experience attending charter schools. The third and last section introduces Bandura's self-efficacy theory and connects his theory to the motivation of high school students and academic success. Together, these three sections deepen the understanding of the research problem and provide insight into the connection between self-efficacy, academic outcome, and school choice, all of which pertain to the continued success of education in the United States.

Charter Schools versus Traditional Public Schools

Charter schools and traditional public schools are both publicly funded educational institutions, but they differ in governance, operational autonomy, and educational approaches. Charter schools are independent entities that operate under a legislative contract or charter approved by a state-authorized

body, such as a school district. They are governed by a group of individuals, including administrators, teachers, and parents, who ensure compliance with the terms of the charter (National Center for Education Statistics, 2023). In contrast, traditional public schools, while also publicly funded, are subject to stricter state regulations that vary across jurisdictions and lack the same level of operational autonomy.

One fundamental requirement for establishing either a charter or a traditional public school is securing a physical location. In California, both types of schools must first obtain approval from the California Department of Education before beginning construction. Additionally, all school facilities are subject to inspection by the Division of the State Architect to ensure compliance with safety standards, including protections against natural disasters such as earthquakes and fires (Division of the State Architect, 2016).

In California, the graduation requirements set forth by the California Department of Education apply to both charter and public schools. The state mandates that students complete the following coursework: 3 years of English, 2 years of mathematics (including Algebra I), 3 years of social science (covering U.S. and world history, geography, government, and economics), 2 years of science (including both biological and physical sciences), 2 years of physical education, and 1 year of either a foreign language, visual or performing arts, or career technical education. Notably, American Sign Language is recognized as a foreign language (California Department of Education, 2024).

While these are the basic requirements, many charter and public schools opt to impose additional academic expectations to better prepare students for university admission. In particular, schools often seek to align their curricula with the entrance prerequisites of the University of California and California State University systems. Despite these similarities, disparities in graduation rates between charter and traditional public schools persist. In the 2023–2024 school year, the five-year cohort graduation rate for California charter school students was 73.3%, significantly lower than the 90.8% graduation rate for non-charter public schools (California Department of Education, 2024). The graduation rate is calculated using a five-year cohort to account for variations resulting from student transfers between schools, placement in juvenile facilities, or relocation out of the state or country.

While both charter and traditional public schools provide a broad range of courses, the specific offerings can vary significantly. Charter schools, in particular, have the flexibility to tailor their curricula to meet the needs of their target student populations. For example, charter schools with a college preparatory focus tend to offer more advanced courses, particularly in fields like science, technology, engineering, and mathematics (STEM), while those serving at-risk youth may prioritize foundational STEM coursework. This flexibility gives charter schools the ability to innovate and offer specialized programs that cater to the interests and needs of their student body (David et al., 2020).

In contrast, traditional public schools, while also offering STEM courses, must adhere to state and district regulations, which can limit their ability to tailor curricula in the same way. This lack of flexibility is one of the key distinctions between charter schools and their traditional counterparts. For example, in 1991, Minnesota passed the United States' first charter school law, allowing teachers to design innovative curricula without the constraints of state regulations or district rules (Peterson and Shakeel, 2024). Over the next 2 decades, 45 states and Washington D.C. enacted similar charter school laws by broadening educational choices for students and families (Peterson & Shakeel, 2024).

Ultimately, both charter and traditional public schools share the common goal of educating and supporting students. However, they differ in their approaches to achieving this goal. Charter schools offer greater flexibility in curriculum design and governance, while traditional public schools are more restricted by state and district regulations. The decision to attend one over the other depends largely on individual preferences, needs, and educational goals.

Charter Schools and Academic Success

Charter schools are a force in the education sector with nationwide enrollment increasing by more than 370,000 students between 2018 to 2021 when traditional public schools were experiencing a significant decline (Wallace, 2024). The increasing enrollment in charter schools may be credited to the academic success of enrolled students. The Center for Research on Education Outcomes at Stanford University conducted a longitudinal study using enrollment and student success data from the academic years 2014 to 2019 and released its third National Charter School Study in June 2023. In this comprehensive study, Raymond et al. (2023) evaluated the academic progress of 1.8 million charter school students and compared them to their counterparts in traditional public schools across the United States. They found that students who attended charter schools in Tennessee outperformed their traditional public school peers by achieving gains in reading comparable to having an additional 33 days of learning and in math nearly 39 days (Raymond et al., 2023). Furthermore, Indianapolis charter schools reported significant academic growth for minority and low-income students. Black students achieved gains equivalent to 65 additional days in English Language Arts (ELA) and 83 days in math when compared to their traditional public school counterparts (Raymond et al., 2023). These gains in effective learning days are not minimal and point to the educational strides some charter schools have been able to afford their students.

Another success case study showed that students who attended a Texas charter school for 1 year experienced an increase of 0.023 in their test scores on the State of Texas Assessments of Academic Readiness (Dobbie and Fryer, 2020). Additionally, the high school graduation rate of this school rose by 1.4 percentage points, while enrollment rates in two-year colleges increased by 0.8 percentage points, and in four-year colleges by 0.7 percentage points. These

statistics are indicative of the academic success some students have been able to achieve at charter schools.

However, students in Indiana charter schools performed similarly to or worse than their traditional public school peers in terms of college and career readiness (Austin and Pardo, 2021). This result was partially because students participating in this research study did not share similar economic and cultural backgrounds. Whereas students enrolled in charter schools were more likely to be historically marginalized, students enrolled in traditional public or school counterparts were not. The factors for assessing college and career readiness included whether high school students had ever failed a course, been suspended, or missed more than 15 days of school (Austin & Pardo, 2021). While Austin and Pardo (2021) acknowledged the presence of unobserved factors, such as the difference in economic and cultural backgrounds, they suggested that these indicators could highlight areas where charter schools might focus their improvement efforts.

The flexibility granted to charter schools plays a role in both their positive outcomes and their challenges. The variability in curriculum for students does not always benefit them. In Boston, Massachusetts, the inconsistency in curricula and teaching methods among charter schools has prompted administrators to implement standardized practices aimed at replicating the success of high-performing campuses (Cohodes et al., 2021). State policies have enabled proven charter school operators to expand by opening new campuses, which have demonstrated significant academic success. Even with relatively inexperienced teachers, the presence of clear instructional structures resulted in student achievement gains comparable to those of the original schools. The research showed a significant improvement in scores, which is determined by a likelihood of error of 1% and thus 99% confidence. Specifically, math scores and ELA scores increased by a significant amount (Cohodes et al., 2021). Moreover, these charter schools enrolled students who were demographically representative of the broader Boston student population. Using data from randomized admission lotteries to eliminate selection bias, researchers found that academic gains were consistent across student groups. Although variability is an inherent characteristic of the charter school model, the Boston case illustrated how effectively replicating successful practices can promote student achievement.

Charter schools have experienced significant enrollment growth and, in some cases, remarkable academic gains, particularly for historically marginalized students. However, these successes are not universal, as inconsistencies in curriculum and student outcomes persist across states. While efforts like those in Boston showed how replicating effective practices can improve student achievement, it is equally important to examine how traditional public schools foster academic success within their own, often more regulated, structures.

Traditional Public Schools and Academic Success

Traditional public schools in the United States originated in the 1830s,

largely due to the efforts of Mann, a Massachusetts legislator and secretary of the state's board of education, who advocated for tuition-free education accessible to all children regardless of socioeconomic status (Kober & Rentner, 2020). Prior to 1830, only students who could afford private schooling or who attended schools funded by charitable donations had educational opportunities (Kober & Rentner, 2020). Since the establishment of public education, individual states have held the responsibility of setting curriculum standards and guiding educators in supporting student learning. For example, while high school graduation requirements vary by school and district, all schools must adhere to state-mandated minimum standards for students to earn a diploma.

In the 2021–2022 school year, the average cohort graduation rate for U.S. public high school students was 87%, marking a 7 percentage point increase compared to a decade earlier. Among various student groups, American Indian/Alaska Native students graduated at a rate of 74%, Black students at 81%, Hispanic students at 83%, White students at 90%, and Asian/Pacific Islander students at 94% (National Center for Education Statistics, 2024). These statistics encompass all types of public high schools, as the data do not differentiate between charter and non-charter schools at the national level.

Although national data are not available, California reveals marked contrasts at the state level. In the 2023–2024 school year, the five-year cohort graduation rate for California charter high school students was 73.3%, whereas all other non-charter schools had a graduation rate of 90.8% (California Department of Education, 2024). The data reveal notable differences in outcomes between charter schools and non-charter schools across all racial and ethnic categories. In charter schools, American Indian or Alaska Native students had a 62.8% graduation rate, African American students 64.0%, Pacific Islander students 66.7%, Hispanic or Latino students 70.6%, students of Two or More Races 76.3%, White students 80.3%, Asian students 85.6%, and Filipino students 91.6%, with a statewide average of 73.3% (California Department of Education, 2024). In contrast, non-charter schools demonstrated consistently higher rates across all groups, with American Indian or Alaska Native students had an 84.5%, African American an 85.4% graduation rate, Pacific Islander students 89.0%, Hispanic or Latino students 89.2%, students of Two or More Races 92.6%, White students 92.8%, Asian students 95.9%, and Filipino students 95.7%. Additionally, students who did not report a race had a rate of 85.2%, and the overall statewide average for non-charter schools was 90.8%. These differences suggest substantial gaps in outcomes between charter and non-charter schools that merit further examination (California Department of Education, 2024).

In summary, while charter schools show promising academic outcomes in certain regions, particularly for historically marginalized populations, their performance remains inconsistent, often influenced by factors such as governance, curriculum design, and community demographics. The research conducted by Noll (2022) highlights a school model focused on college prepa-

ration. However, this approach represents a singular experience that is only accessible to students attending that specific institution. In contrast, Peña (2023) offered a science-based curriculum, which, while beneficial for some students, may not suit all learners, particularly those with interests in other subjects. Traditional public schools, while more standardized and widespread, also experience variability in student outcomes, especially across different states and demographic groups. This suggests that no universally effective approach exists, as both types of schools offer distinct benefits and challenges. Therefore, to truly understand the effectiveness of charter schools, it is crucial to move beyond general comparisons and examine how specific student populations, particularly marginalized groups, experience these educational environments.

Marginalized Students in Charter Schools

Marginalized students have faced systemic barriers to accessing quality education and achieving long-term academic success since the inception of formal education in the United States. Prior to the establishment of public schools, educational opportunities were largely for white children from affluent families who could afford private schooling or tutoring. The movement for universal publicly funded education emerged in response to these inequities. Advocates argued that educating the entire population was essential to reducing poverty, crime, and other social challenges. These arguments remain central to education policy debates in the 21st century (Kober & Rentner, 2020).

Education is not recognized as a fundamental right under the U.S. Constitution, leaving the responsibility for protecting and ensuring access to education for all students to individual states. This principle was affirmed by the U.S. Supreme Court in San Antonio Independent School District v. Rodriguez (1973), a landmark case that exposed deep disparities in school funding rooted in the reliance on local property taxes. In this case, parents from a low-income, predominantly Mexican American community in Texas, challenged the state's public school financing system and argued that their children received an inferior education when compared to students in wealthier districts. The plaintiffs highlighted significant gaps in per-pupil spending, teacher quality, facilities, and educational resources between affluent and economically disadvantaged school districts. Despite acknowledging these disparities, the Court ruled in a 5-4 decision that education is not a fundamental right under the Constitution, and that the funding system did not violate the Equal Protection Clause. As a result, states have significant discretion in allocating educational resources, which can contribute to structural inequities affecting low-income and marginalized communities.

Marginalized students often reside in neighborhoods characterized by lower property taxes, which is a direct consequence of their socioeconomic status. This inequity leads to disparities in the quality of education they are likely to receive, underscoring the importance of providing these students with viable educational options (San Antonio Independent School District v. Rodriguez, 1973). Furthermore, these students often belong to ethnic groups

that are historically underrepresented in higher education. For instance, during the 2021-2022 academic year in California, 55.1% of African American high school graduates and 55.2% of Hispanic or Latino graduates enrolled in college, compared to 67.8% of White graduates and 85.4% of Asian graduates (California Department of Education, 2022).

This emphasizes the critical need for marginalized students to have access to educational environments that not only facilitate learning but also foster personal growth and prepare them for future success. This becomes particularly pertinent for high school students as they transition out of the education system and begin to explore post-secondary opportunities. Without adequate support during this critical phase, students from marginalized communities may face additional barriers to accessing higher education and career opportunities.

Marginalized Students and Academic Success

The impact of charter schools on the academic success of marginalized students has been a key area of research, with scholars utilizing quantifiable data such as grades and standardized test scores to assess outcomes. Multiple research scholars examined the impact of charter schools on the academic success of marginalized students by using available quantifiable data like grades and standardized test scores (Bu & Mendenhall, 2022; Raymond et al., 2023; Shakeel & Peterson, 2021; Wallace, 2024). Raymond et al. (2023) published their third National Charter School Study, which examined data from the 2014–15 to 2018–19 school years. This nationwide study assessed the academic progress of 1.8 million charter school students by comparing their grades with those of students in traditional public schools across the U.S. The study revealed that more charter schools outperform their traditional district public school counterparts. Moreover, the study found that Black and Latino charter school students in poverty experience greater academic success than their traditional school counterparts, achieving the equivalent of an additional 30 days of learning in both math and reading (Wallace, 2024).

The National Assessment of Educational Progress also published a study that revealed success at the national level. Shakeel and Peterson (2021) analyzed student performance data from the National Assessment of Educational Progress spanning 2005 to 2017. Their study found that charter school students made significantly greater academic gains, equivalent to nearly an additional 1/2 year of learning, compared to their peers in traditional district public schools. These gains were particularly pronounced among African American and low-income students. Shakeel and Peterson (2021) suggested that these improvements may be attributed to either enhanced teaching effectiveness within charter schools or unobserved student selection factors, such as their socioeconomic background and family support.

Research on the academic performance of marginalized students in charter schools often incorporates multiple data sources to evaluate outcomes. In a Chicago-based study, Bu and Mendenhall (2022) used both grades and

standardized test scores, including the SAT and PARCC, to assess the academic success of Black and Latino students in charter schools. Their study, which analyzed Illinois Report Card data representing 119 public schools during the 2016–2017 academic year, aimed to understand which demographic group could more systematically benefit from charter schools. The analysis, based on data from a diverse sample of charter schools, found that Latino students tend to perform better academically in these institutions. Specifically, the analysis revealed that Latino students in charter schools consistently scored higher on standardized tests compared to their peers in traditional public schools. This suggests that charter schools may offer a more effective academic environment for Latino students, particularly in terms of test performance, and raises questions about the factors contributing to these outcomes, such as school resources, teaching methods, and curriculum focus.

While Black students in charter schools often have greater access to certain educational resources, their academic success remains comparatively limited. This highlights the need for more nuanced, equity-based approaches to education (Bu & Mendenhall, 2022). Although persistent inequities continue to exist within charter schools, these studies provide valuable insight into the academic strides that marginalized student populations have been able to achieve.

Marginalized Students and their Learning Experience

Enrollment in a charter school is often a consciously evaluated decision made by students and families. In metropolitan areas across the United States, Denice (2022) found evidence of significant spatial mismatch, meaning a geographic disconnect between where school-age children live and where high-performing schools are located. This spatial mismatch disproportionately affects Black and Hispanic students, contributing to higher enrollment rates of these groups in charter schools as families seek better educational opportunities (Denice, 2022).

Beyond access to higher-performing schools, charter schools can also offer greater cultural representation and leadership for marginalized students. Ankrum (2025) examined the engagement strategies of Black male principals in majority-Black charter schools in the northeastern United States. This qualitative study, based on the experiences and leadership practices of 15 Black male principals, found that these effective leaders prioritized building genuine relationships with parents grounded in trust and mutual respect. These principals maintained visibility and presence on campus and at school events by fostering connections with both students and families. They also acknowledged the trauma experienced by Black communities and openly addressed institutional racism and historical injustices. Through culturally responsive communication, empathy, and understanding, these leaders promoted environments where students felt seen, valued, and supported (Ankrum, 2025). Such affirming environments can help students express their authentic identities, leading to increased self-confidence, engagement, and academic success.

In sum, charter schools can offer meaningful benefits for marginalized students, particularly in terms of academic achievement and emotional well-being. Dighero et al. (2024) argued that these gains are driven not only by academic improvements but also by the culturally responsive leadership and community-centered values embedded in many charter schools. As such, charter schools represent a meaningful alternative for families seeking equitable, affirming, and accessible educational experiences for their children.

Academic Success of High School Students Through Motivation

Motivation plays a critical role in determining academic success during the high school years, a period marked by increasing academic pressure and social complexity. For many students, motivation is not solely internal but is shaped by their environments, relationships with educators, and institutional expectations (Dighero et al., 2024). Charter schools, particularly those designed with college readiness in mind, may influence student motivation differently than traditional public schools (Noll, 2022). This section explores how both self-esteem and school structures impact motivation, particularly for marginalized students, and how charter schools may either support or hinder the motivation drive of students to succeed academically and pursue higher education.

High School Students and Self-Esteem

Self-efficacy theory continues to shape academic discourse by emphasizing the significant role that self-belief plays in student motivation and achievement (Bandura, 1978). Self-efficacy refers to an individual's belief in their ability to accomplish specific tasks or activities. This belief can be strengthened through positive reinforcement and encouragement from others, which in turn fosters greater self-confidence and resilience. In educational settings, students' self-efficacy—particularly their belief in their capacity to succeed academically—can be nurtured by supportive educators. When teachers express belief in their students' abilities, this support can bolster students' self-belief and motivate them to strive for higher levels of success. Recent research by Dighero et al. (2024) underscored the power of self-esteem in academic resilience, revealing that Latino students facing systemic racism were able to overcome these challenges within positive school environments that affirmed their ethnic identities. These affirming climates were associated with improved academic outcomes, including higher grades and GPAs.

The role of supportive school environments in promoting academic success for marginalized students has been examined. Dighero et al. (2024) emphasized that positive school climates are fostered when schools allocate resources toward teacher training focused on belonging and community building. Moreover, the study underscored the importance of incorporating culturally responsive curricula, such as reading literature, writing essays, and offering classes that promote Latino identity and challenge negative stereotypes that can diminish students' self-esteem and academic motivation. Conversely, schools that fail to address systemic racism risk perpetuating environments where students internalize prejudice, often manifesting in more punitive dis-

ciplinary measures or discouragement from applying to four-year universities (Dighero et al., 2024). Creating learning environments where students believe in their ability to succeed is essential to fostering motivation and academic achievement.

Although affirming ethnic identity is crucial, self-efficacy extends beyond cultural identity because self-efficacy is fundamentally tied to the relationships students build with educators. Peña (2023) conducted a study of students attending Xinaxtli Charter School, an alternative pathway for students who, as Peña described, were "pushed out" of traditional classrooms (p.571). These students, many of whom were previously considered low-achieving, reported newfound motivation and success, earning grades of B or higher in science courses they had failed in the past. They attributed their success to teachers who built genuine and supportive relationships, honored the diverse perspectives students brought to the classroom, and incorporated culturally relevant science content that empowered informed decision-making. This case study exemplifies how self-efficacy, cultivated through strong student-teacher relationships and affirming curricula, can significantly improve academic outcomes, even among students with histories of academic struggle.

Charter High School Students and Motivation to Pursue Higher Education

Charter high schools that emphasize college readiness often increase the awareness students have of their academic progress, which can serve as a key source of motivation. Even the physical environment of these schools reinforces college-going expectations, with university pennants and other visual cues prominently displayed to create a culture focused on postsecondary success (Noll, 2022). Schools like Performance High exemplify this approach by embedding college preparation into their daily practices and school identity. Students are expected to complete essential college-preparatory activities such as submitting the Free Application for Federal Student Aid (FAFSA), requesting letters of recommendation, and registering for standardized tests. These tasks are not only encouraged but formally tracked and graded, with counselors working closely with students to ensure they apply to colleges that are realistic matches based on their academic records and financial situations. Counselors also assist students in developing financial plans to help them afford and complete their university education (Noll, 2022).

While these efforts support motivation for many students, some express feeling disconnected from the process, particularly when their aspirations differ from the school's guidance. For example, students interested in attending Historically Black Colleges and Universities sometimes feel discouraged if these options are perceived as financially out of reach, despite the personal and cultural significance such institutions hold for them (Noll, 2022). Nevertheless, the constant focus on academic progress and college access fosters a school culture where motivation remains a central priority throughout all 4 years of high school.

Overall, student motivation is strongly connected to the relationships they build with educators, the cultural responsiveness of their learning environments, and the expectations placed upon them by their schools. For marginalized students in particular, self-esteem and motivation are closely tied to feeling seen, supported, and affirmed. Charter schools that prioritize college readiness, build strong student-teacher connections, and implement inclusive and community-centered curricula are more likely to enhance motivation and academic outcomes. When educators recognize and invest in the unique identities and potential of students, those students, regardless of background or previous performance, can become more motivated to succeed in high school and beyond.

Motivating Charter and Public High School Students

One of the key advantages of charter schools is that teachers do not need to deal with many of the rigid and often cumbersome requirements typical of traditional public schools (California Charter Schools Association, 2020). Flexibility allows educators to focus on developing lesson plans that are tailored to the specific needs of the students in their classrooms. Charter schools provide teachers with greater flexibility that allows them to adjust their teaching and respond to the evolving needs of their students, which can vary significantly from year to year.

However, Teachers in California are taught to be responsive and adaptive to meet the unique needs of each class (California Educator Credentialing Examinations, 2025). The rigid structure of traditional public schools often makes flexibility difficult. The limited time available during the school day, combined with the extensive expectations placed on teachers, burdens teachers to fully implement personalized instruction. Teachers have limited time and space to engage with students individually, and thus those who would benefit most from additional support may be overlooked.

Research showed that self-efficacy plays a vital role in academic motivation; when students feel seen and supported, they are more likely to believe in their ability to succeed (Dighero et al., 2024). However, there is limited literature examining whether the autonomy of charter schools directly leads to increased academic success for students. While students in traditional public schools are equally capable of achieving academic success, the mechanisms and experiences that contribute to that success may differ. Whether charter schools consistently cultivate environments that promote intellectual engagement and more enjoyable educational experiences remains an area requiring further research and exploration.

Summary

Chapter 2 examined the distinctions between traditional public schools and charter schools by focusing on their governance, operational autonomy, and educational approaches. While traditional public schools adhere to stricter state regulations, charter schools operate with greater flexibility in curriculum design and governance that allow these schools to tailor offerings to specific

student needs (Peter & Shakeel, 2024). Academic outcomes, however, reveal inconsistencies; national studies indicated that charter school students, particularly Black and Latino students in poverty, achieve greater academic success, with gains equivalent to additional learning days in math and reading (Raymond et al., 2023). Conversely, California data for the 2023–2024 school year showed charter high schools present a significantly lower five-year cohort graduation rate (73.3%) compared to non-charter public schools (90.8%) across all racial and ethnic categories (California Department of Education, 2024). Critics also argued that charter schools divert essential funding from traditional public schools, impacting their financial stability.

The chapter also highlighted the experiences of marginalized students within charter schools. These students have historically faced systemic barriers to quality education due to factors like funding disparities rooted in local property taxes, as San Antonio Independent School District v. Rodriguez (1973) illustrated. Charter schools often address spatial mismatch by providing Black and Hispanic students with increased access to higher-quality schools closer to home, despite instances of "White flight" into charters in some areas. These schools frequently offer greater cultural representation and leadership. For example, Black male principals, who built genuine relationships, addressed community trauma and created affirming environments where students feel valued and supported (Ankrum 2025). In turn, they contributed to the increased self-confidence and academic success of their students.

Furthermore, this literature review underscored the critical role of motivation and self-efficacy in academic achievement. Drawing on Bandura's Self-Efficacy Theory, the discussion emphasized that a student's belief in their ability to succeed significantly influences their academic outcomes. Supportive educators, positive school climates, and culturally responsive curricula all strengthen self-efficacy and foster motivation, particularly for Latino students navigating systemic racism (Dighero et al., 2024). Ultimately, the support students receive from educators, regardless of school type, fundamentally determines their academic success and helps them recognize their unique talents. This implies that fostering student success is less about the educational model and more about the consistent, tailored nurturing that educators provide.

Chapter 3 will explore the practical and political implications of these focal points, with an emphasis on how educational policy and school structures shape student outcomes. Furthermore, recommendations for future research will address gaps identified in the current literature. Notably, there remains limited scholarly discussion regarding marginalized groups beyond ethnic background. Future studies should consider the unique experiences of students in rural charter and public schools, as well as pursue comprehensive, national, cross-regional analyses to gain a broader understanding of these issues.

Chapter 3: Implications
Introduction

This project explored the impact of charter schools on the academic success of high school students, specifically students from marginalized populations. As educational options expand beyond traditional public schools, charter schools are gaining attention for their ability to provide tailored academic support, especially for students who have not flourished in traditional public school settings. The significance of this investigation lies in the increasing debate over the role of charter schools within the broader education system. While charter schools have been credited with higher academic success rates among high school students (Reber et al., 2024), concerns persist about their potential to divert resources from traditional public schools (Mullen, 2024). This study sought to answer three key research questions:

    1. What is the difference in graduation rates between charter high school students and those in traditional public schools?

    2. Do marginalized high school students experience greater academic success in charter schools compared to traditional public schools?

    3. Does attending a charter school lead to increased motivation among high school students?

This Chapter includes findings for each research question in the Conclusion section. It also presents implications and recommendations for educators, lawmakers, and educational researchers.

Conclusions

Based on the 2023 to 2024 school year, the five-year cohort graduation rate for charter high school students was 73.3%, versus a significantly higher 90.8% graduation rate for students in non-charter schools (California Department of Education, 2024). When comparing racial and ethnic groups, charter schools showed notably lower graduation rates across all categories. American Indian or Alaska Native students in charter schools graduated at a rate of 62.8%, compared to 84.5% in non-charter schools. Similarly, African American students in charter schools had a graduation rate of 64.0%, while their peers in non-charter schools graduated at 85.4%. Pacific Islander students in charter schools had a graduation rate of 66.7%, which is lower than the 89.0% seen in non-charter schools. Hispanic or Latino students in charter schools graduated at 70.6%, compared to 89.2% in non-charter schools.

Students of Two or More Races in charter schools had a graduation rate of 76.3%, while those in non-charter schools graduated at 92.6%. White students in charter schools graduated at 80.3%, whereas White students in non-charter schools had a graduation rate of 92.8%. Asian students in charter schools had a graduation rate of 85.6%, which is lower than the 95.9% for Asian students in non-charter schools. Filipino students in charter schools graduated at a rate of 91.6%, whereas their peers in non-charter schools had a slightly higher graduation rate of 95.7%. For students who reported their race, the graduation rate in charter schools was 90.8%. In contrast, students who did

not report a race in non-charter schools had a graduation rate of 85.2%.

Overall, these disparities reflect significant achievement gaps between charter and non-charter schools, highlighting the need for further analysis of the factors contributing to these differences (California Department of Education, 2024). However, these graduation rates only reflect the state of California. More quantitative research is needed to define the difference between graduation rates in charter versus traditional public high schools at a national level.

The type of school and the programs that the schools offer to students do not guarantee the academic success of marginalized high school students. Instead, having positive teacher-to-student relationships and a supportive learning experience outweighs the school type and programs. Schools should recognize and celebrate the unique identities of all students, including the marginalized students, in order to foster confidence and reinforce a positive self-perception in academic success (Brooms, 2021). Furthermore, educators are at the forefront of change in the lives of students and can support students as role models and mentors, especially if they share a similar background as their students (Ankrum, 2025).

Educators significantly influence student motivation, and their amount of support can shape the success of students more so than the school type (Dighero et al., 2024). A positive teacher-to-student relationship correlates with high self-efficacy, which ultimately cultivates a stronger belief in their ability to succeed and a higher level of motivation to work harder academically (Bandura, 1978). This is especially true for marginalized students, who may not experience as much support outside of school and can benefit significantly from the encouragement and guidance their educators provide. In conclusion, the academic success of students is a matter of support rather than a specific model or practice in education. Students reach success when their teachers recognize their talents and actively encourage them to pursue their academics with vigor.

Practice Implications

First, teachers can integrate culturally responsive assignments and activities into their course curricula to highlight identity, build positive self-image, and encourage motivation. High school is a time when students are not only preparing for graduation and college entrance but also forming their own identity. In addition to academic support, students also need teachers to help them navigate the complexity of self-perception (Dighero et al., 2024). Integrating cultural aspects into the course curricula is important to forming the identity of marginalized students; therefore, culturally responsive curricula, such as reading literature, writing essays, and offering classes that can shape their identity and challenge negative stereotypes, can improve the self-esteem and academic motivation of high school students (Dighero et al., 2024).

Secondly, teachers can collaborate with local and national organizations to implement proven support frameworks beyond the classroom cur-

riculum. Teachers can partner with community-based organizations such as Big Brothers Big Sisters of America which offers school-based mentorship to students. Teachers can also distribute applicable information from the organizations to their students and families throughout the school year so they receive additional support outside of the school setting.

Lastly, to support teachers, school principals can advocate for community-building trainings that involve activities facilitated by the teacher or an outside community-based organization. Through district partnership with local and national organizations, school principals can invite these organizations to come to their schools and provide training with proven frameworks for their teachers (Dighero et al., 2024). Teachers may be the ones in charge of their classroom, but principals are responsible for ensuring all students are in an environment that supports their academic goals and meets the mission of the school (Noll, 2022).

While these practices are essential for fostering success in individual classrooms, systemic changes at the policy level are equally crucial. Policies that prioritize teacher well-being, promote culturally responsive teaching, and ensure equitable resources for students can amplify the impact of classroom strategies, creating an environment where both educators and students thrive. In order to achieve long-term, meaningful improvements, educational policies must address the root causes of disparities and support sustainable development in both teaching and learning.

Policy Implications

At the state level, policymakers should consider increasing funding for all high school homeroom teachers, both in charter and traditional public schools, to attend annual professional development training focused on building community within their classrooms and school sites. Training programs may vary based on the location of the school and the community-based organizations present in the area. This community-building training should occur before the start of the school year and involve teachers collaborating with their students through activities at the beginning of the school year to foster a sense of togetherness and connection in each homeroom classroom. Training also includes how to support the unique identities of their students. By partnering with consultants who specialize in the importance of celebrating diverse backgrounds, teachers learn new frameworks and strategies to authentically and respectfully support their students.

At the district level, the District should provide adequate resources and strategies for teachers on how to build a learning community and foster a sense of belonging among their students. The District should allow teachers opportunities to attend conferences and training sessions with diverse perspectives on supporting the whole being of students: emotionally, socially, and mentally (Dighero et al., 2024). In addition, the District should work with the State to ensure that curricula are culturally sensitive and inclusive of diversity. Curricula should be a work of collaboration of multiple stakeholders, includ-

ing consultants who are experts in cultural competence and inclusive teaching practices (Dighero et al., 2024).

At the union level, educators need to ensure the voices of all teachers and students are heard by policymakers. Teacher unions and certain lobbying groups can serve as a valuable tool and aid in governmental advocacy, as it is their responsibility to work on behalf of the teachers' interests (American Federation of Teachers, 2025; Fair Political Practices Commission, 2025). For example, unions and lobbying groups can argue and make recommendations for block grants. If funding can be allocated as a block grant, such that the government is giving money to local levels of authority that is specifically for teacher development or a cultural consultant as part of the training, then schools would not have to worry about needing to allocate their limited funds for such training and risking budget cut for all other areas also in financial need.

Directions for Future Study

The review of literature revealed limitations in research that warrant further investigation. First, due to a lack of available resources, this study did not account for possible variables that could also impact the academic success of students. These variables include household income, race and ethnicity, gender, and parental education levels, which may all significantly influence school choice, grades, and graduation rates (Shakeel & Peterson, 2021). Future studies on whether or how these variables influence school choice would provide a more holistic perspective on the impact of charter schools on the academic success of high school students.

Another limitation is that existing research disproportionately focuses on urban populations and neglects suburban and rural contexts. A more inclusive and cross-regional analysis would address this gap and offer a broader understanding of how charter and public schools function across diverse geographic settings. Such an approach could uncover additional factors affecting academic performance and school satisfaction in less-studied areas.

The last limitation is that existing research tends to be number-driven and lacks qualitative data. In the absence of personal insights, an important aspect of the school choice experience remains underexplored. Future studies would benefit from interviews with families whose children attended both charter and traditional public schools. An exploration of their motivation behind their school choice would provide a more nuanced understanding of how school selection influences not only academic outcomes but also emotional and social development.

Summary

This study underscores the critical role of educator support in determining student success, particularly for marginalized populations in both charter and public schools. Key findings suggest that the presence of tailored support, recognition of students' unique identities, and culturally responsive curricula are essential for fostering academic motivation and achievement. The implications for practice emphasize the importance of teachers building a sup-

portive community-oriented classroom environment and the need for policies that ensure educators receive training and have all the necessary resources. Further research studies on the impact of charter schools on academic success would benefit from the exploration of additional variables such as household income, student choice in school selection, and regional differences in educational experiences, to fully understand the broader implications of charter school attendance on student outcomes.

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The Impact of Digital Screen Time on the Social-Emotional Development of Elementary-Aged Students

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Abstract

This project examined the social-emotional impacts of excessive recreational screen time on elementary-aged students, with a focus on three key developmental areas: self-regulation, academic motivation, and peer relationships. Grounded in Bandura's Social Learning Theory, the project synthesized and thematically analyzed peer-reviewed studies from the past two decades to examine how digital engagement influences children's behaviors, learning habits, and interpersonal development. Excessive screen time was consistently associated with impaired emotional control, reduced attention span, and decreased behavioral inhibition. Screen exposure also displaced academic habits, weakened executive functioning, and diminished intrinsic motivation. Excessive screen time was also associated with poorer face-to-face communication, lower empathy, and weakened peer connection. Some benefits were noted when screen time was structured, educational, or adult-supported; however, overall, the evidence emphasized the negative developmental impacts. The project highlighted the multidimensional risks associated with unregulated screen exposure during critical developmental years. These findings underscore the importance of early intervention, media literacy education, and the role of parental modeling in shaping children's digital habits.

Chapter 1: Introduction to the Project
Background

The rapid expansion of digital media has transformed how children interact with the world. This increasing presence of screens in children's daily lives has raised concerns about its influence on their developing brains. The early years of development are critical for forming self-identity, emotional intelligence, and interpersonal relationships, making it essential to examine the role of digital media in these formative stages (Beatty & Egan, 2020; Gong & Tao, 2024). As digital platforms become more accessible, children engage with social media at younger ages, often without fully developed self-regulation skills or an understanding of digital literacy (Beatty & Egan, 2020). According to recent studies, spending too much time on screens can cause deficits in social, emotional, and behavioral development (Haplin et al., 2021; Radesky & Christakis, 2016). Therefore, excessive screen use can impair these developmental processes, leading to deficits in emotional regulation, attention, and social relationships (Haag et al., 2025; Jourdren et al., 2023).

Around the world, kids spend more time on screens each day than is advised by public health organizations (Madigan, Racine, & Tough, 2019). National data from 2020 reveal that approximately 65% of American children aged 2 to 17 exceed two hours of recreational screen time per day on weekdays, with elementary-aged children falling within this range (Ng & Black, 2022). Children aged 5 to 8 spend an average of over three hours per day using screen media, and by ages 8 to 12, this increases to more than five hours daily, excluding schoolwork (Rideout et al., 2025). The majority of this screen time is spent on entertainment media, including online videos, television, gaming, and social media. For example, by 2021, 38% of U.S. tweens reported using social media, despite age restrictions on most platforms (Rideout et al., 2025). Nearly half of children in this age group have watched short-form videos on platforms like TikTok or Reels, and the usage among elementary school students has reached 66%, surpassing that of high school students (Gong & Tao, 2024; Rideout et al., 2025). Forty percent of 2-year-olds own tablets, and nearly a quarter of 8-year-olds have their own phones (Rideout et al., 2025).

Health organizations, including the World Health Organization (WHO), the American Academy of Pediatrics (AAP), and the Centers for Disease Control and Prevention (CDC), have all issued guidelines to manage screen time. For children over 5, the WHO (2019) emphasizes limiting sedentary screen time and prioritizing physical activity and sleep, but does not set a specific hourly cap. According to their policy on screen use, the AAP (2016) suggests children aged 2 to 5 should be limited to one hour of high-quality programming per day, co-viewed with an adult. For children aged six and older, there is not a strict time limit but an encouragement to set consistent limits to ensure screen use does not interfere with sleep, exercise, or family time (AAP, 2016). The CDC aligns with the AAP, recommending that children engage in at least 60 minutes of physical activity daily and suggesting that recreational screen time should be limited to two hours per day (CDC, 2022). While exact recommendations may vary, there is international consensus that screen time for elementary-aged children should be limited, supervised, and balanced with active play, sleep, and in-person interactions.

Much of the existing research examining children's screen time habits was conducted before the rise of short-form digital media, including platforms like TikTok, Reels, and YouTube Shorts. Although guidelines from organizations such as the WHO (2019) caution against prolonged sedentary screen use, they do not fully account for the unique features of rapid-consumption media that dominate the attention of young users today. Consequently, there is a growing need for research that investigates how these evolving recreational screen behaviors affect critical areas of development (Rideout et al., 2025). Given these concerns, this study aims to examine the overarching impact of screen media on the social and emotional development of elementary-aged children, with a focus on social relationships, attention, and self-regulation. This research aims to add to a more comprehensive understanding of the im-

plications of early digital media exposure and inform strategies for supporting young learners in a digitally saturated world.

Statement of the Problem

The increasing integration of digital recreational screen use into children's daily lives has raised critical concerns about its effects on their social and emotional development. Children today are exposed to screens at earlier ages and for longer periods than ever before. According to Rideout et al. (2025), children aged 8 to 12 spend an average of five hours and 33 minutes per day on screen-based entertainment. While some recreational screen use can support learning and creativity, excessive and unstructured screen time may lead to negative outcomes such as increased anxiety, decreased emotional regulation, and weakened relationships (Orben et al., 2019; Twenge & Campbell, 2018).

Elementary-aged students are particularly vulnerable, as they are still developing essential skills in self-regulation, motivation, and attention. For instance, children who spend a significant amount of time on screens have been found to exhibit poorer attention spans and increased impulsivity (Santos et al., 2022). As children struggle to focus and manage emotions effectively, the negative effects of screen time are especially evident in young children, who may lack the ability to regulate their emotions and behavior in response to impulsive or reactive digital content (Thorell et al., 2024). Nesi and Prinstein (2018) noted that technology can expose children to persistent digital feedback loops, which may influence their self-esteem and emotional stability. Additionally, children who are consistently exposed to digital media may struggle with emotional regulation due to the constant stream of reactive content they encounter, which affects their ability to manage emotions and relate to others in healthy ways (Haag et al., 2025). In addition to cognitive and emotional development, excessive screen time also shapes children's social relationships. Social media use has been linked to social comparison, a behavior that can undermine self-esteem and distort relationships (Nesi & Prinstein, 2018). As children internalize these digital behaviors, their ability to form healthy, in-person friendships may suffer (Farrugia & Busuttil, 2021). As screen time continues to rise, there is a growing urgency to explore how excessive recreational screen time is shaping the developmental experiences of elementary students. Without further study, these unresolved issues may contribute to long-term academic disengagement and emotional difficulties during a critical stage of growth. Although prior studies have explored the effects of generalized screen time on children's development, the rapid emergence of short-form digital content, such as TikTok and Instagram Reels, presents a newer media environment that has been underrepresented in research focused on young learners (Gong & Tao, 2024; Rideout et al., 2025). Educators and caregivers often lack the data and guidance necessary to make informed decisions about technology use in school and home settings.

Purpose of the Project

The purpose of this study is to investigate the impact of excessive recreational screen use on the social and emotional development of elementa-

ry-aged students, with a particular focus on its effects on their social relationships, motivation, and self-regulation. While there is general recognition that screen time impacts child development, a significant gap remains in research specifically addressing how elementary-aged students internalize these effects in ways that shape their academic and personal growth.

Excessive and unstructured recreational screen time has been associated with disruptions in key developmental areas of elementary students (Haplin et al., 2021; Radesky & Christakis, 2016). The project aims to provide new insights into how early digital habits impact students' relationships with their peers, their ability to stay motivated in classroom settings, and their capacity to regulate emotions and behaviors (Bal et al., 2024; Burnell et al., 2022; Twenge & Campbell, 2018).

Studies have shown that excessive screen time disrupts attention and self-regulation, affecting children's ability to succeed academically and maintain healthy social relationships (Bal et al., 2024; Santos et al., 2022). Thorell et al. (2024) found that increased screen time is associated with attention difficulties, which makes it harder for children to focus on classroom tasks or engage in meaningful social exchanges. Research suggests that excessive recreational screen use is often accompanied by disrupted sleep patterns, which can further impair children's ability to concentrate and manage emotional responses during the school day (Cerniglia et al., 2021; Twenge & Campbell, 2018; Walsh et al., 2013). Similarly, Haag et al. (2025) suggest that screen-based engagement can lead to emotional instability, further hindering children's ability to form positive social connections. These findings highlight the importance of further research on how digital media use influences children's social-emotional development, particularly among elementary-aged students who are still in critical stages of learning to regulate their emotions and behaviors.

Screen-based environments often expose children to emotionally reactive, impulsive, or unrealistic portrayals of behavior that may undermine the development of stable self-concept and emotional regulation (Bandura, 2001; Nesi & Prinstein, 2018). Furthermore, as children spend increasing amounts of time engaging with screens rather than in-person interactions, real-world feedback and adult modeling may be diminished, which can impact their ability to internalize prosocial behaviors and build self-efficacy (Bal et al., 2024; Gioia et al., 2021).

Much of the existing literature predates the widespread adoption of short-form video platforms, leaving a gap in understanding how these evolving screen use patterns influence the motivation, self-regulation, and social relationships of elementary-aged students (Rideout et al., 2025; Santos et al., 2022). Early and excessive recreational screen use interferes with students' social and emotional development in ways that require timely intervention by educators, families, and policymakers. Beyond individual habits, children's screen use behaviors are significantly influenced by their home environments. Studies show that children whose parents frequently use digital devices for recreation

are more likely to mirror these behaviors, spending greater amounts of unsupervised time on screens themselves (Lauricella et al., 2015).

This study aims to inform those interventions with a deeper, developmentally informed understanding of the consequences of unregulated screen exposure.

The following research questions will guide the study:

1. How does excessive screen time affect the self-regulation of elementary-aged students?

2. How does excessive screen time affect the motivation of elementary-aged students?

3. How does excessive screen time affect the social relationships of elementary-aged students?

By using these questions to guide research, this project aims to provide meaningful insights that can inform instructional practices, parent education, and future research efforts focused on fostering healthier digital habits among young learners.

Theoretical Framework

This study draws on Albert Bandura's Social Learning Theory, first proposed in 1977, which offers a foundational lens for understanding how excessive recreational screen time may impact the social and emotional development of elementary-aged students. Bandura's (1961) theory posits that a significant portion of human learning takes place within a social context and is influenced by observation, imitation, and modeling. According to this framework, individuals acquire new behaviors by watching others and replicating their actions, mainly when those actions appear to be rewarded (Bandura, 1986). In this digital age, children's most influential models are not limited to parents, teachers, or peers but now include models encountered through screens.

Social Learning Theory emphasizes the interaction between personal factors, behavior, and the environment, which Bandura (1986) refers to as reciprocal determinism. This dynamic model is highly relevant to how children experience technology. When children repeatedly engage with digital content, they are not merely consuming information but are learning behaviors, emotional responses, and social norms through continuous observation and interaction with virtual models (Bandura, 2001). This process is especially concerning when digital content lacks educational or prosocial value. For example, video content that reinforces impulsivity, social comparison, or aggression may hinder children's ability to self-regulate and develop emotional resilience (Bandura, 2001; Nesi & Prinstein, 2018).

Social Learning Theory in media contexts has shown that children are highly impressionable when exposed to screen-based behaviors (Bandura, 2001). Bandura's Bobo doll experiment demonstrated that children who observed aggressive behavior were more likely to imitate it in similar settings (Bandura et al., 1961). Today, the Bobo doll is replaced by a constant stream

of online videos and short-form media that may reward shallow, impulsive, or emotionally reactive behavior. Such screen-based models often prioritize immediacy and emotional reactivity, which can affect children's real-world attention span and behavior (Gong & Tao, 2024; Twenge & Campbell, 2018).

Bandura used the term vicarious reinforcement, which refers to the idea that people are more likely to imitate behaviors they observe being rewarded. This term is a compelling explanation for why digital platforms are so engaging to young users. Likes, comments, and follower counts serve as social rewards, reinforcing behaviors that may not align with educational goals or emotional maturity (Bandura, 1986). These reinforcements may compete with or even replace traditional forms of academic motivation and attention, as evidenced in high screen time linked to decreased school engagement and academic performance (Walsh et al., 2020; Burnell et al., 2022).

Social Learning Theory also helps explain the decrease in self-regulation skills due to digital content exposure. Bandura (1986) asserted that self-regulation is developed through observed behaviors and environmental feedback. When children engage with media that promotes reactive or reward-seeking behavior, their ability to manage impulses, focus their attention, and persist through challenging tasks may be compromised. This finding is consistent with research that links excessive technology usage to decreased emotional control and increased behavioral issues in childhood (Bal et al., 2024; Gioia et al., 2021).

By having this study within the context of Social Learning Theory, a deeper understanding emerges of how excessive screen usage functions not only as a behavioral model but also as a cultural force that can shape social and emotional development. Bandura's framework offers a powerful explanation for the behavioral difficulties observed in children exposed to high levels of screen time. It provides a theoretical bridge between the educational and developmental challenges under investigation and the broader media environment that contributes to them.

Additionally, the theory provides a direct conceptual foundation for the dependent variables in this study. In terms of relationships, Bandura (1986) emphasized that social behavior is largely learned through interaction and observation. In digital environments, children are frequently exposed to idealized social interactions or hierarchies that may distort their understanding of real-life friendships and contribute to social comparison (Brunick et al., 2016; Nesi & Prinstein, 2018). Regarding motivation, Bandura (1986) argued that behavior is influenced by observed rewards, known as vicarious reinforcement. This mechanism is reflected in the digital space where likes, shares, and digital feedback can replace intrinsic motivation with reward-seeking behavior, potentially undermining persistence in school tasks (Twenge & Campbell, 2018). Finally, self-regulation, a key outcome of this study, is also a product of modeled behavior and environmental cues. When digital content emphasizes immediate gratification or emotional reactivity, it can hinder children's ability to delay grat-

ification or manage emotions effectively (Burnell et al., 2022; Bal et al., 2024). Finally, the dynamics of home environments on the digital habits of elementary-aged students reflect key principles of Bandura's Social Learning Theory, where children observe, imitate, and internalize modeled behaviors within their immediate environments (Bandura, 2001; Ghaisani & Salam, 2022). The normalization of recreational screen use in family contexts, such as during meals, outings, or daily routines, may contribute to difficulties in self-regulation, social development, and intrinsic motivation. These connections reinforce the relevance of Social Learning Theory to the study's core focus and outcomes.

Definition of Key Terms

The following terms are used throughout this study and are defined to provide clarity and consistency for the reader:

Digital Media: Any activity that involves the use of a digital device for leisure, such as playing games, utilizing social media platforms, or participating in information or entertainment consumption on the Internet. (Thorell et al., 2022).

Elementary-aged students: Children typically enrolled in kindergarten through fifth or sixth grade, generally ranging in age from 5 to 11 years.

Excessive screen time: Screen engagement that exceeds developmental guidelines and begins to interfere with healthy physical, cognitive, or emotional functioning. For elementary-aged children, excessive screen time typically refers to use beyond two hours of recreational screen exposure per day, as recommended by the Centers for Disease Control and Prevention (2022) and the World Health Organization (2019). Excessive use is further associated with adverse outcomes, including decreased attention span, disrupted sleep, impaired social relationships, and reduced academic motivation (Rideout et al., 2025; Santos et al., 2022).

Motivation: The internal drive or external incentives that influence a child's willingness to engage in and persist with tasks, particularly within educational contexts (Bandura, 1986).

Social relationships: The interactions, friendships, and social dynamics experienced between children of similar age groups and between adults. In this study, the term refers to both in-person and digitally influenced connections (Nesi & Prinstein, 2018).

Recreational screen time: Time spent using screen-based devices (e.g., tablets, smartphones, TVs, computers) for non-academic and entertainment purposes, such as gaming, social media, or video streaming (Rideout et al., 2025).

Self-efficacy: An individual's belief in their ability to succeed in specific situations or accomplish a task. In educational contexts, it refers to students' confidence in their learning capabilities (Bandura, 1986).

Self-regulation: The ability to monitor and manage one's emotions, thoughts, and behaviors to achieve long-term goals. It includes impulse control, emotional regulation, and attention management (Burnell et al., 2022).

Summary

There is growing concern about the impact of recreational screen time on the social and emotional development of elementary-aged children. Through an overview of current screen usage statistics, including national and international data, the chapter established that many children exceed public health recommendations for daily screen use (Ng & Black, 2022; Rideout et al., 2025). The background section synthesized a range of studies that highlight associations between high screen time and developmental risks such as attention problems, emotional instability, and weakened social relationships (Haag et al., 2025; Madigan et al., 2019; Santos et al., 2022). While screen-based environments offer entertainment and learning potential, they also introduce behavioral models that may conflict with children's social and cognitive growth.

This chapter explained that screen use is rising among children at a time when they are most vulnerable to its developmental effects. Although research on screen time has expanded in recent years, a lack of studies remains that specifically examine the impact of short-form content, such as TikTok, Instagram Reels, and YouTube Shorts. These platforms have become dominant forms of media for children, characterized by rapid pacing, algorithm-driven recommendations, and emotionally provocative content (Gong & Tao, 2024; Rideout et al., 2025). A lack of research on this newer type of screen time specificity limits understanding of how these fast-paced media environments influence key areas of child development, including attention, emotional regulation, and social competence (Haag et al., 2025; Santos et al., 2022). This literature review addresses the gap by synthesizing recent findings and highlighting the distinct developmental risks posed by excessive screen use, examining its effects on social relationships, motivation, and self-regulation in elementary-aged students.

Bandura's Social Learning Theory (1961, 1986, 2001) was introduced as the guiding theoretical framework, explaining how children internalize behaviors modeled through digital media. The theory provides a conceptual foundation for understanding how screen-based models in media, such as TV or short-form videos, can impact children's ability to relate to others, sustain intrinsic motivation, and regulate emotions (Bal et al., 2024; Nesi & Prinstein, 2018; Twenge & Campbell, 2018).

Chapter 2 presents a review of literature on recreational screen use, focusing on key themes including self-regulation, motivation, and social relationships. Chapter 3 will elaborate on the implications of this study for educational policy. Together, these chapters provide the foundation for investigating the impact of recreational screen use among elementary-aged children, while ultimately informing educators and families with practical strategies.

Chapter 2: Review of Related Literature
Introduction

The increasing presence of digital media in children's lives has raised significant concerns about its impact on the social-emotional development of

elementary-aged students. Children today are exposed to screens at an earlier age and for longer durations than previous generations, often exceeding established health guidelines. Excessive recreational screen time has been linked to reduced self-regulation, decreased academic motivation, and disruptions in social relationships (Cerniglia et al., 2021; Konok et al., 2024; McArthur et al., 2022). While some screen use may have educational value, the risks of unstructured and prolonged screen time have become increasingly evident, especially during crucial developmental periods when children are still developing healthy self-regulation, motivation, and social skills (Mallawaarachchi et al., 2024; Gioia et al., 2021).

This chapter provides a review of research that examines the effects of excessive recreational screen time on the social and emotional development of elementary-aged students. Its purpose is to examine how existing studies have investigated the impact of excessive recreational screen time on the social and emotional development of elementary-aged students. The review is organized into three key strands that reflect the study's focus: Self-Regulation, Motivation, and Social Relationships. The self-regulation strand explores how screen time affects children's ability to manage their emotions, attention, and behavior. The motivation strand analyzes the influence of digital media on children's academic drive, persistence, and self-efficacy. The social relationships strand examines how digital media influences children's interactions with their peers and adults, encompassing face-to-face socialization, problematic internet use, and the evolving dynamics of relationships in the digital age. Together, these strands lay a foundation for understanding how early and excessive recreational screen exposure may affect children's emotional, academic, and social development.

Self-Regulation

Excessive exposure to screens during childhood may have disrupted the development of self-regulation, particularly in areas such as attention, emotional reactivity, and impulsivity. The literature showed a connection between excessive screen use and weakened self-regulatory abilities. It also showed that the environment around children, especially parents, plays a significant moderating role in either mitigating or exacerbating these effects.

Self-regulation has been identified as a critical component of social-emotional development in elementary-aged children, encompassing a child's ability to monitor emotions, inhibit impulsive behavior, and sustain attention over time (Crowell, 2021; Gioia et al., 2021). CASEL (2023) defines self-management as the ability to regulate one's emotions, thoughts, and behaviors effectively. As digital media increasingly permeated early childhood environments, concerns grew regarding its potential influence on the development of self-regulatory capacities. The literature demonstrated that screen time disrupted self-regulation through its role in early behavioral development, its association with attention dysregulation, and its complex interaction with environmental and parenting factors (Konok et al., 2024; Mallawaarachchi et

al., 2024; Radesky et al., 2014).

Foundations of Self-Regulation in a Digitally Saturated Childhood

Self-regulation developed rapidly in early childhood as children acquired behavioral strategies to manage emotions and behavior. From infancy, children learned to inhibit or amplify emotional responses while developing control over emotional excitement (Crowell, 2021). However, as digital media became increasingly integrated into children's daily lives, new challenges to self-regulation emerged. The widespread accessibility of digital devices blurred the distinction between physical and virtual spaces in children's experiences (Farrugia & Busuttil, 2021). Early exposure to screen media appeared to interfere with normative developmental processes involved in emotional and behavioral self-regulation. Screen time during childhood was negatively associated with behavioral outcomes, including emotion dysregulation, poor executive functioning, and externalizing behavior problems (Kerai et al., 2022; Konok et al., 2024). Prolonged exposure during these sensitive developmental windows corresponded with lower developmental screening scores, reinforcing the long-term nature of these effects (Madigan et al., 2019; McArthur et al., 2022). Additionally, screen time during infancy displaced vital caregiver-child interactions that were traditionally necessary for fostering adaptive emotional coping, frustration tolerance, and inhibitory control (Konok et al., 2024; Kostyrka-Allchorne et al., 2017; Mallawaarachchi et al., 2024). Early reliance on digital devices as tools to calm or distract children appeared to limit opportunities to practice critical skills in emotion modulation and internal regulation (Konok et al., 2024; Tamana et al., 2019).

Screen exposure often began at very young ages. By two years old, 40% of children owned a tablet, with ownership increasing to more than half of children by age four (Rideout et al., 2025). This early introduction coincided with heightened neural plasticity, amplifying the potential risks associated with excessive screen time (Mallawaarachchi et al., 2024). Increased screen exposure predicted poorer cognitive, socioemotional, and physical development outcomes (McArthur et al., 2022). Infants exposed to television and videos before the age of three demonstrated deficits later in language, attention, executive functioning, and school readiness (Radesky et al., 2014). Longitudinal research further showed that greater screen use at 24 and 36 months predicted lower developmental screening scores at later ages (Madigan et al., 2019).

The nature, content, and structure of media exposure played an equally important role in shaping self-regulatory outcomes. Passive engagement with rapidly shifting and highly stimulating content predicted higher levels of attention problems, externalizing behaviors, and delayed cognitive skills (Kostyrka-Allchorne et al., 2017; Mallawaarachchi et al., 2024). In contrast, co-viewing educational programs with caregivers yielded more favorable developmental outcomes, including improved language acquisition and stronger executive functioning (Madigan et al., 2020; Mallawaarachchi et al., 2024; Streegan et al., 2022). Parental co-viewing provided opportunities for cognitive scaffold-

ing and emotional co-regulation during screen use, buffering children against potential risks associated with media exposure (Streegan et al., 2022; Mallawaarachchi et al., 2024). Serve-and-return interactions, in which caregivers responded to children's cues, supported healthy self-regulation development, while passive screen exposure lacked these beneficial interactions (Stienwandt et al., 2022). Parental co-use of screens during media routines was positively associated with children's cognitive outcomes (Mallawaarachchi et al., 2024). Conversely, unsupervised or passive screen use limited opportunities for caregiver responsiveness and joint attention (Farrugia & Busuttil, 2021).

The theoretical foundation for how screen time affects the self-regulation of elementary students aligns with Bandura's social cognitive theory, which explains how media exposure shapes self-regulation through observational learning. Digital media offered children external models of behavior that were often imitated, whether adaptive or maladaptive (Bandura et al., 1961). Screen media often portray characters demonstrating impulsive decision-making, aggression, or emotionally dysregulated behavior, providing behavioral scripts that children may have incorporated into their own coping repertoires (Bandura et al., 1961; Konok et al., 2024; Gioia et al., 2021). Emotional regulation that involved screen exposure often shifted regulation externally to devices rather than strengthening internal coping mechanisms (Crowell, 2021; Konok et al., 2024). Furthermore, habitual reliance on external devices for emotion management potentially reduced children's development of internal self-soothing capacities, weakening long-term self-regulation abilities (Konok et al., 2024; Madigan et al., 2019; Farrugia & Busuttil, 2021). Reliance on digital devices for emotional soothing potentially disrupted the development of frustration tolerance and inhibitory control (Konok et al., 2024; Kerai et al., 2022). Difficulties in emotional regulation also contributed to increased risk for problematic internet use, as children used media consumption to compensate for underlying emotional deficits (Gioia et al., 2021). Frequent device use as a calming strategy limited children's practice of self-regulation skills necessary for independent coping (Radesky et al., 2014; Konok et al., 2024). Researchers emphasized that future research must consider not only the quantity of screen time but also the content, context, and parental involvement that shape children's experiences with media (Mallawaarachchi et al., 2024).

Screen Time and Attention Dysregulation

Attention dysregulation represented one of the most consistently identified outcomes associated with early and excessive screen exposure. Higher levels of screen use in early childhood have been consistently linked to significant attention difficulties across numerous studies (Jourdren et al., 2023). Longitudinal research has shown that excessive screen time during the preschool years is associated with long-term impairments in attentional functioning (Madigan et al., 2019). These associations were particularly pronounced when screen use began early, with even brief periods of exposure predicting attention challenges later in development (Jourdren et al., 2023).

Some research has attributed these outcomes to the fast-paced, overstimulating nature of much of the content that young children consume, which offers limited opportunities for practicing sustained attention or delaying gratification (Gioia et al., 2021; Konok et al., 2024). Unlike face-to-face interactions that required real-time responsiveness, many screen-based activities promoted passive engagement and constant novelty, reinforcing patterns of cognitive fragmentation and impulsivity. When practiced repeatedly, these habits appeared to transfer into offline settings, such as classrooms, where children struggled to concentrate on tasks or follow multi-step directions (Haag et al., 2024; Mallawaarachchi et al., 2024). Together, the literature suggested that early screen exposure disrupted the gradual development of executive attention, with developmental costs that extended across academic and social contexts.

Exceeding recommended screen time thresholds increased the likelihood of attention-related clinical diagnoses. Tamana et al. (2029) asserted that children who engaged in more than two hours of daily screen time were nearly eight times more likely to meet diagnostic criteria for ADHD. Longitudinal studies further established that problematic digital media use and ADHD symptoms appeared to reinforce each other over time, creating reciprocal patterns of dysregulation (Thorell et al., 2021). These findings highlighted not only the heightened risk for formal diagnoses but also the cumulative nature of attentional and behavioral challenges that developed with frequent, unstructured screen exposure. In a meta-analysis review, small but significant connections were identified between screen use and both externalizing and internalizing behavioral problems, suggesting that attention deficits often co-occurred with emotional dysregulation (Caballero-Julia et al., 2024; Eirich et al., 2022). Together, these patterns suggested that early screen habits played a foundational role in shaping attentional and behavioral trajectories.

Environmental changes during the COVID-19 pandemic appeared to exacerbate these patterns. With physical schooling interrupted and structured routines diminished, children turned to digital content not only for leisure but also as a coping mechanism during periods of isolation and uncertainty. Increases in recreational screen use were associated with corresponding increases in psychological well-being concerns (Wu et al., 2024). Screen exposure during this period often expanded as children used devices for entertainment at home, reducing opportunities for alternative activities that support attention development (Ribner et al., 2021). Children reported engaging with screens for more than 50 additional minutes daily during the pandemic, with much of this time spent on entertainment-based media use (Ribner et al., 2021). These pandemic-driven shifts underscored how environmental factors interacted with screen use to amplify attention-related concerns, prompting further exploration into the mechanisms driving these outcomes.

Cognitive theories provided insight into the mechanisms by which screen use disrupted attention regulation. Rapidly changing media environments trained children to scan and shift attention quickly, weakening their ca-

pacity for sustained concentration (Thorell et al., 2021). Such overstimulation frequently led to difficulty transitioning from digital environments to settings that required sustained, goal-directed effort, such as reading or classroom tasks. Exposure to fast-paced, highly stimulating content has been shown to reinforce impulsivity, diminish frustration tolerance, and disrupt attentional control (Konok et al., 2024). These disruptions made it increasingly difficult for children to engage in extended, goal-directed tasks that require focus (Caballero-Julia et al., 2024; Thorell et al., 2021). Given these emerging patterns, it became essential to consider not just the amount of screen time but also the specific features of media content that affected children's attentional development.

In addition to directly influencing cognitive processing, excessive screen use displaced unstructured play, which naturally supported the development of executive functioning and sustained attention (Kerai et al., 2022). These screen-related displacements were especially concerning during early childhood, a period when unstructured play and interactive caregiving laid the foundation for neural pathways associated with executive control. As children spent more time with screens, opportunities for free play, family interaction, and peer engagement were diminished, further reducing attention-regulating experiences (McArthur et al., 2022). Even at very early stages of development, attentional skills functioned as a foundation for cognitive growth, executive control, and learning, making these losses particularly significant (Jourdren et al., 2023). When such foundational experiences were compromised, children's ability to manage attention in more complex academic and social settings was likely to suffer.

Beyond attentional functioning, screen overuse was associated with broader emotional and behavioral challenges. Children who engaged in problematic smartphone use demonstrated increased risks for depression, anxiety, and stress, which often co-occurred with attentional difficulties (Sohn et al., 2019). Sleep disruption represented another key pathway connecting screen use to attention problems. Screen exposure near bedtime impaired melatonin production, delayed sleep onset, and resulted in fragmented sleep patterns (American Academy of Pediatrics [AAP], 2016). Poor sleep quality, in turn, compromised children's capacity to concentrate and regulate behavior the following day (AAP, 2016). Over time, these compounding effects of emotional strain, sleep deficits, and inattentiveness could reinforce one another, creating a self-sustaining cycle of dysregulation that proved challenging to interrupt. The multidimensional nature of these impacts highlighted the importance of examining the specific content and context of media use, including emerging trends such as short-form video.

The rise of short-form video content introduced additional risks for attentional deconstruction. Children increasingly consumed brief, highly stimulating videos on platforms such as TikTok, YouTube Shorts, and Instagram Reels, with daily use of short-form content growing substantially in recent years (Rideout et al., 2025). This constant shift in stimuli left little room for

cognitive processing or memory consolidation, diminishing children's ability to follow through on longer or more complex tasks. Exposure to this rapid-fire media environment further conditioned children's attentional habits toward novelty seeking and brief focus (Rideout et al., 2025). High pace and unpredictable reinforcement inherent to short-form content interfered with executive functioning and sustained attention (Kostyrka-Allchorne et al., 2017). Beyond content duration and speed, the context in which children engaged with screens, such as in the presence of background media, also shaped their attention development.

Background television exposure also disrupted attentional processes. Studies linked greater background television exposure to weaker language skills and compromised play behaviors that typically supported attentional regulation (Madigan et al., 2020). Even when children were not actively watching, the presence of background television fragmented their attention and interfered with their ability to engage in sustained imaginative play or caregiver interaction. Background media interfered with children's focused learning, language acquisition, and executive functioning development (Karani et al., 2022; Mallawaarachchi et al., 2024). High levels of background television were further associated with deficits in behavioral control and cognitive flexibility (Kostyrka-Allchorne et al., 2017). Taken together, these findings underscore the importance of both active and passive screen exposure in understanding attention outcomes across childhood.

Excessive screen exposure contributed to attention dysregulation through multiple pathways, including cognitive conditioning, displacement of enriching experiences, disrupted sleep, and co-occurring emotional difficulties. These diverse pathways worked in tandem, contributing to attention profiles that influenced children's readiness to learn and interact meaningfully with their environment. Attention dysregulation functioned as a key mechanism by which screen time undermined broader self-regulatory capacities. The following section will explore how parenting behaviors, family media environments, and socioeconomic factors further shape these developmental outcomes.

Environmental Context in Shaping Screen-Based Self-Regulation

Parenting behaviors played a crucial role in moderating the relationship between screen exposure and self-regulation outcomes. Caregiver co-viewing, monitoring, and scaffolding during screen use consistently emerged as protective factors that supported children's cognitive, emotional, and language development (Madigan et al., 2020). When caregivers participated in co-viewing, children demonstrated stronger language skills and greater cognitive gains, suggesting that parental mediation could buffer against some of the adverse effects associated with screen use (Karani et al., 2022). The co-use of media by parents and children was positively related to cognitive outcomes, emphasizing the value of adult guidance during screen experiences (Mallawaarachchi et al., 2024). In addition to co-viewing and scaffolding, parents also played broader roles as facilitators, teachers, and gatekeepers in children's digital technology

use, guiding the nature of media content and establishing boundaries for access (Konca, 2021). Active co-viewing allowed parents to help children process content, model emotional responses, and engage in discussions that supported regulatory development (Streegan et al., 2022). Professional organizations emphasized the importance of developing individualized family media plans to promote intentional, balanced, and developmentally appropriate media use within households (AAP, 2016).

In less supportive home contexts, parenting stress and emotional strain often led caregivers to rely more heavily on screens to occupy or calm their children, inadvertently reinforcing external regulation strategies (Stienwandt et al., 2022; Konok et al., 2022). Parenting stress was associated with increased supervised screen time and reduced hands-on play, limiting opportunities for face-to-face emotional learning (Stienwandt et al., 2022). When parents experienced elevated psychological distress, they were more likely to offer screen-based soothing strategies that displaced meaningful co-regulation experiences (Rosendo-Rios et al., 2022; Konok et al., 2022). Caregivers also faced challenges balancing their own screen use with their children's needs, often modeling problematic media habits (AAP, 2016).

The broader home media environment further shaped children's screen behaviors and self-regulation outcomes. Children from lower-income households exhibited higher total daily screen use compared to their higher-income peers, reflecting both structural inequalities and limited access to alternative enrichment activities (Rideout et al., 2025). These disparities were not merely quantitative but also qualitative, as children from lower socioeconomic backgrounds were more likely to engage with less interactive and more entertainment-based content (McArthur et al., 2022). Additionally, socioeconomic conditions influenced the likelihood of adult supervision or co-use during media engagement, with lower-income families less often providing scaffolding or conversational support that could buffer the negative impacts of screen time (Konok et al., 2022; Ribner et al., 2021). Such disparities pointed to the ways in which broader ecological factors shaped the opportunities children had to develop attentional control

Parental digital habits also contributed significantly to children's screen behaviors. Parents who frequently used digital devices themselves were more likely to model heavy screen use, shaping children's habits through observational learning mechanisms consistent with social cognitive theory (Bandura et al., 1961; Konca, 2021). In homes where parents used screens to regulate their own stress or distraction, children were more likely to adopt similar coping mechanisms, reinforcing passive rather than reflective behavioral responses (Stienwandt et al., 2022). Even when screen time was not explicitly encouraged, parental distraction or emotional unavailability due to media multitasking often reduced meaningful parent-child interaction, a key factor in early self-regulatory development (Radesky & Christakis, 2016).

Moreover, family-level stressors compounded these risks. Parental de-

pression, economic hardship, and inadequate childcare access have all been linked to elevated screen exposure in children, particularly during unstructured times of day (McArthur et al., 2022). Under such circumstances, screens often became default caregivers, providing short-term behavioral regulation but undermining the development of intrinsic control over time. The use of screens in these contexts tended to correlate with greater emotional reactivity and impulsivity in children, as they missed out on experiences that build delay of gratification and emotional self-monitoring (Kerai et al., 2022; Mallawaarachchi, 2024). These findings emphasized how environmental risk factors interacted with screen use to shape long-term trajectories of self-regulation.

The home environment's digital culture further shaped children's emotional coping strategies and their capacity for self-regulation. When parents regularly turned to digital devices to soothe their children during moments of distress, this practice cut opportunities for children to develop essential emotional competencies such as self-soothing and frustration tolerance (Konok et al., 2024). Over time, children who relied on screen-based distraction to manage dysregulation became more vulnerable to problematic internet use and emotional dependency on external stimuli (Gioia et al., 2021). These behavioral patterns illustrated how screens often substituted internalized strategies with immediate gratification, thereby disrupting the maturation of regulation systems. Emotional flexibility that is typically developed through co-regulated experiences with caregivers was replaced by algorithmically driven content aimed at capturing attention instead of encouraging reflection, leaving children ill-equipped to manage discomfort independently (Radesky et al., 2014).

Structural inequalities embedded within socioeconomic status further amplified these risks, as families with limited resources often faced increased barriers to regulating screen use, accessing high-quality content, and supporting co-regulation through parent-child interactions (Radesky & Christakis, 2016; Rideout et al., 2025; McArthur et al., 2022). In lower-income households, screens often served practical functions such as occupying children while caregivers worked irregular hours or juggled multiple jobs, making the excessive use of screens both a result of economic hardship and a coping mechanism (Kerai et al., 2022). The digital divide extended beyond access to devices, including differences in the consistency of parental monitoring, emotional scaffolding, and quality of digital engagement. Furthermore, children from these households experienced disproportionate exposure to entertainment or recreational content, rather than educational or interactive media (Konok et al., 2022). These cumulative disadvantages reflected how systemic inequities in income, education, and caregiving support, combined with digital habits, created developmental vulnerabilities that extended beyond individual parenting choices.

Parenting practices, home environments, and broader socioeconomic conditions functioned not only as contextual factors but also as active moderators in the relationship between screen exposure and self-regulation. While some families were able to buffer children from the risks of excessive screen

time through consistent emotional co-regulation and strategic content use, others lacked the resources to do so consistently. The presence or absence of emotionally attuned parenting, structured routines, and responsive media boundaries ultimately determined whether digital media functioned as a tool for resilience or as a source of dysregulation. These findings highlighted that the effects of screen time could not be removed from the familial systems in which children were raised, emphasizing the need for policy-level interventions that support families in creating developmentally responsive media environments.

Motivation

Excessive screen use adversely affected children's academic motivation through multiple interconnected mechanisms. Passive screen engagement displaced essential academic behaviors such as studying, classroom participation, and homework completion, directly reducing academic achievement across language, mathematics, and school readiness domains (Madigan et al., 2019; Gong & Tao, 2024; Walsh et al., 2013). Exposure to fast-paced, highly stimulating content interfered with executive functioning, delayed gratification, and emotional stability, all of which are foundational to academic persistence (Lillard & Peterson, 2011; Kostyrka-Allchorne et al., 2017; Twenge & Campbell, 2018). Fast-paced editing, multitasking, and cognitive overload overwhelmed working memory capacity, resulting in reduced attention, diminished academic behaviors, and lower academic confidence (Gong & Tao, 2024; Walsh et al., 2013). These repeated failures to manage cognitive demands reinforced avoidance, eroded self-efficacy, and weakened children's internal motivation for sustained academic engagement (Xie et al., 2024; Cerniglia et al., 2021). Screen use not only displaced valuable academic behaviors but also weakened children's underlying motivational systems through disrupted self-regulation, impaired executive function, reduced confidence, and maladaptive parental modeling. Together, these mechanisms undermined students' academic persistence, motivation, and overall achievement. By cultivating self-awareness, educators can help students identify internal sources of motivation, such as personal goals and values, that counteract the extrinsic reinforcement systems of screen-based platforms (CASEL, 2023).

Digital Displacement of Academic Drive

Screen engagement had a significant impact on the academic motivation and performance of elementary-aged children. As children spent increasing amounts of time engaged with screens, academic behaviors such as studying, sustained attention, and class participation were often displaced (Caballero-Julia et al., 2024; Walsh et al., 2013). Higher levels of screen use were consistently associated with poorer academic outcomes, including reduced vocabulary, mathematical ability, and developmental readiness (Madigan et al., 2019). These effects appeared most pronounced when screen use replaced cognitively enriching activities such as reading, problem-solving, and interactive play. Screen exposure was found to negatively relate to homework completion

and academic engagement when the time spent watching television increased (Kostyrka-Allchorne et al., 2017). This displacement effect not only limited academic growth but also reduced children's intrinsic interest in learning tasks. The COVID-19 pandemic, which was declared a global health emergency by the Word Health Organization (WHO) in 2020, dramatically altered children's daily routines and social environments due to the widespread school closures, social distancing mandates, and increased reliance on digital technologies for education, entertainment, and communication (Lee, 2020). The pandemic exacerbated these trends, as children increased their daily screen use for entertainment and schooling, leading to further academic challenges (Trott et al., 2022). Higher daily screen time was strongly linked to declines in attention, task persistence, and classroom engagement (Caballero-Julia et al., 2024; Pagani et al., 2013). These declines extended across both language and math domains, indicating broad academic consequences related to excessive screen exposure (Cerniglia et al., 2021).

Social media usage introduced additional academic challenges, as it frequently fostered multitasking and fragmented attention. It further contributed to academic disengagement, as increased usage was associated with reduced cognition, increased distraction, and lower academic performance (Bhandarkar et al., 2021). Students with higher levels of social media engagement were more likely to report academic difficulties and performed worse than peers with lower usage (Bhandarkar et al., 2021). These associations reflected not only time displacement but also cognitive overload caused by constant notifications, social comparisons, and emotionally charged content. The cognitive demands of toggling between academic tasks and digital communication drained attentional resources needed for learning, reducing both retention and motivation. Digital engagement often operated on reinforcement schedules, training students to seek immediate feedback and novelty that contrasted sharply with the sustained effort required in academic contexts. The rise of short-form video platforms such as TikTok and YouTube Shorts further compounded academic disengagement. Children increasingly turned to highly stimulating content on apps such as TikTok, YouTube Shorts, and Instagram Reels, which prioritized novelty and brevity over sustained cognitive engagement (Gong & Tao, 2024). These platforms trained users to consume content in bursts of rapid clips, reinforcing habits of distraction and instant gratification. As a result, children who engaged heavily with short-form video content frequently reported difficulty concentrating, shortened attention spans, and increased procrastination in academic tasks (Gong & Tao, 2024). The shift toward these fast-paced digital environments disrupted goal-oriented behaviors, making it harder for students to sustain focus during extended assignments or structured learning activities.

Cognitive research supported these findings, showing that exposure to fast-paced media diminished children's executive functioning and reduced their capacity to regulate attention over time (Kostyrka-Allchorne et al., 2017). The fragmented attention habits reinforced by short-form content not only inter-

fered with academic engagement but also eroded critical study habits, including task persistence and time management. Broader usage data further confirmed that children's daily consumption of short-form video content had surged in recent years, particularly in the post-pandemic digital landscape (Rideout et al., 2025). These trends, when considered together, raised concerns that academic motivation in the digital age was being compromised not only by screen quantity but also by the cognitive and behavioral patterns shaped by specific types of media consumption (Twenge & Campbell, 2018; Rideout et al., 2025).

The nature of screen content also influenced academic motivation. Highly engaging, fast-paced visual media encouraged addictive patterns of consumption, which further pulled attention away from learning responsibilities (Gong & Tao, 2024). These platforms often rewarded novelty seeking and discouraged sustained cognitive engagement, leading to increased task-switching and reduced persistence on academic goals. Multitasking between academic work and digital entertainment weakened focus, delayed task completion, and increased susceptibility to distraction (Bhandarkar et al., 2021). Children who frequently alternated between entertainment media and academic tasks reported difficulty concentrating, especially when trying to complete homework or study for assessments (Gong & Tao, 2024). This form of digital multitasking contributed not only to lower academic productivity but also to long-term motivational decline, as students developed habits of fragmented attention and diminished persistence.

Gaming and multitasking behaviors also contributed to academic disengagement, though their impact varied by game type, frequency, and context. Excessive engagement with video games was commonly associated with reduced academic motivation, poor study habits, and behavioral avoidance of academic tasks (Islam et al., 2020; Karim et al., 2024). Competitive or violent gaming genres correlated with decreased verbal achievement and increased behavioral problems, especially when gameplay extended beyond recommended durations (Islam et al., 2020; Karim et al., 2024). Although some evidence indicated potential benefits for specific subgroups, such as problem-solving gains among certain demographics, these advantages were often offset by declines in language and reading performance when play became excessive or unstructured (Hofferth, 2010; Karim et al., 2024). Weekday video game use, particularly when exceeding two hours per day, was associated with significantly lower academic performance in both reading and numeracy. In contrast, limited weekend game play showed slight positive associations (Islam et al., 2020). These findings suggested that timing, structure, and content quality shaped whether gaming served as a motivational boost or a distraction from learning.

However, not all forms of digital engagement hindered academic motivation. Passive, unstructured consumption of screen content was most strongly linked to adverse academic outcomes, whereas interactive and cognitively stimulating media offered potential benefits when used appropriately (Kostyrka-Allchorne et al., 2017). High-quality educational games that included ele-

ments of challenge, feedback, and problem-solving fostered active learning and supported academic motivation under the right conditions (Santos et al., 2022; Karim et al., 2024). Educational programs and apps designed for developmental engagement were associated with gains in language development, school readiness, and executive functioning (Bal et al., 2024; Choe et al., 2025). Crucially, the presence of caregiver involvement and structured media environments further enhanced these benefits. When parents scaffolded media experiences and co-participated in digital learning, children demonstrated stronger motivation, cognitive growth, and engagement (Streegan et al., 2022). These findings emphasized that the design, supervision, and intent of media use were central to determining whether screen time served as a tool for academic enrichment or a source of distraction.

Self-Efficacy and Intrinsic Motivation

The relationship between screen use and academic motivation was not only dependent on academic engagement but also intricately connected to children's self-efficacy and intrinsic drive. Excessive screen use, particularly of fast-paced and visually stimulating media, hindered children's ability to practice delayed gratification and cultivate academic persistence. For example, brief exposure to fast-paced television cartoons immediately impaired executive functioning in preschool-aged children (Lillard & Peterson, 2011). Even nine minutes of such exposure led to reduced cognitive control, which hindered children's capacity to maintain focus and resist distractions during academic tasks (Lillard & Peterson, 2011).

These effects stemmed from cognitive overload, which disrupted children's limited processing capacity. When exposed to rapidly shifting digital content, children were required to split attention across multiple stimuli, undermining memory, learning transfer, and self-directed thinking (Gong & Tao, 2024). This exposure conditioned attentional patterns toward novelty-seeking and fragmented focus, weakening their tolerance for slower-paced, effortful learning environments (Kostyrka-Allchorne et al., 2017). Over time, the preference for immediate gratification eroded the capacity to sustain interest in tasks that required goal-oriented delay, a core component of academic motivation.

In addition to direct cognitive effects, the emotional context of learning was also disrupted by heavy screen use. Research consistently showed that high levels of recreational screen exposure were linked to lower self-control, reduced curiosity, and increased distractibility, which were factors essential to intrinsic academic drive (Twenge & Campbell, 2018). Children with heavy media use showed significantly poorer socioemotional regulation, which limited their ability to focus, persist, and emotionally engage in classroom activities (Burnell et al., 2023; Streegan et al., 2022). Emotional reactivity further compounded this effect, as children who experienced difficulty regulating their emotions were more likely to disengage from challenging learning tasks rather than persevere.

Foundational language skills also played a role in shaping children's motivation, as language development delays hindered children's confidence and

academic persistence. Early and excessive screen use was associated with diminished vocabulary growth, lower reading comprehension, and impaired language processing (Massaroni et al., 2024). These deficits led to reduced confidence in academic settings, as children struggled to participate in tasks that required expressive and receptive language (Radesky et al., 2014). Frustration stemming from language-based challenges contributed to a lowered academic self-concept, which undermined their motivation to persist through difficult academic content (Xie et al., 2024).

Parental digital practices further influenced the development of motivation and played a significant role in shaping children's internal drive toward learning. When parents frequently used digital devices, children were more likely to model disengagement and develop screen-based coping strategies, rather than goal-oriented perseverance (Gong & Tao, 2024; Bandura, 1986). Conversely, parental involvement, such as active co-viewing, guided content selection, and discussions around media, served as protective mechanisms that supported children's cognitive and motivational growth (Mallawaarachchi et al., 2024). Parents' ability to guide content selection, set limits, and encourage discussion around media consumption directly influenced children's motivation and self-regulatory capacity (Radesky & Christakis, 2016). These structured media practices encouraged children to approach digital tools as educational resources rather than distractions, fostering stronger motivation for learning.

The broader family environment also shaped these outcomes. Children exposed to both excessive screen time and harmful parenting practices showed significantly lower developmental functioning across domains related to motivation, including persistence, executive functioning, and cognitive flexibility (Caballero-Julia et al., 2024; Xie et al., 2024). In contrast, positive parenting environments characterized by warmth, structure, and engagement were associated with higher levels of self-efficacy and intrinsic motivation, both of which contributed to improved academic performance (Xie et al., 2024). These findings emphasized that while screen exposure alone presented risks, the family context in which it occurred either amplified or mitigated its effects.

Cognitive Load and Academic Focus

Excessive screen exposure indirectly undermined children's academic motivation by impairing cognitive load management and executive functioning, both of which are core components of sustained academic success. Many forms of digital media, particularly fast-paced and visually stimulating content, overwhelmed children's developing processing systems and placed excessive strain on their working memory. Research indicated that even brief exposure to this type of media could disrupt executive functioning almost immediately, interfering with behavioral regulation, attention control, and goal-directed activity (Lillard & Peterson, 2011; Kostyrka-Allchorne et al., 2017). Even brief exposure to fast-paced content produced immediate declines in young children's executive function, suggesting that digital media could disrupt cognitive processes necessary for learning (Lillard & Peterson, 2011). These cognitive processes

were foundational to academic performance, and their disruption made it more difficult for children to engage meaningfully with learning tasks.

When cognitive load exceeded children's developmental capacity, learning became increasingly inefficient. Cognitive Load Theory (CLT) explained how excessive media exposure impeded knowledge acquisition. CLT emphasized that processing multiple competing stimuli simultaneously impaired knowledge acquisition and long-term retention (Gong & Tao, 2024). When children were bombarded with multiple forms of stimulation, their capacity to encode, store, and apply information became compromised (Gong & Tao, 2024). The constant barrage of visual and auditory stimuli limited children's ability to transfer information to working memory and interfered with complex problem-solving skills essential to academic performance (Kostyrka-Allchorne et al., 2017). Over time, these deficits in executive function led to inefficiencies in learning and reduced cognitive flexibility, both of which contributed to frustration and motivational decline, particularly when tasks became more complex.

As executive function weakened, children became increasingly vulnerable to multitasking behaviors, further reducing focus and academic perseverance. Digital multitasking disrupted cognitive consistency and hindered the depth of academic engagement (Caballero-Julia et al., 2024; Walsh et al., 2013). Frequent multitasking between social networking, video consumption, and academic work led to declines in study habits, academic behaviors, and overall confidence (Walsh et al., 2013). These patterns were especially concerning as they often eroded children's confidence in their own academic capabilities. Children who often divided their attention across multiple platforms reported higher levels of distraction and lower confidence in their academic abilities (Xie et al., 2024). These reductions in confidence negatively influenced motivation, as children became less likely to persevere through academic difficulties (Xie et al., 2024). A weakened sense of self-efficacy increased the likelihood that children would disengage from challenging tasks, contributing to a cycle of avoidance and underperformance.

Social media engagement compounded these difficulties by creating indirect stressors that interfered with academic focus. Social media often produced indirect pathways toward reduced academic engagement by introducing additional academic stressors. Screen-based multitasking was associated with indirect declines in grade point average through diminished academic behaviors, reduced self-confidence, and growing academic problems (Walsh et al., 2013). Although individual differences influenced the degree of these effects (Orben et al., 2019), multitasking with social media consistently related to declines in GPA, reduced study behaviors, and increased feelings of academic strain (Walsh et al., 2013). These stressors not only detracted from time spent on academic work but also increased cognitive fatigue, making it harder for children to reengage with learning.

Language delays and attention issues were linked to excessive screen time, which undermined children's confidence and self-perception regarding

academic performance. Children with reduced literacy, numeracy, or memory skills, often associated with high screen use, reported lower academic confidence and weaker persistence (Xie et al., 2024). Extended screen use led to lower motivation to engage academically (Xie et al., 2024). Language development was susceptible to screen overuse. Children with delayed expressive and receptive language skills were more likely to experience comprehension difficulties, limited vocabulary growth, and reduced classroom participation (Massaroni et al., 2024). As children encountered repeated challenges in academic settings, their decreased confidence led to lower self-efficacy, reduced motivation, and ultimately, academic disengagement (Cerniglia et al., 2021). As children internalized their academic difficulties, motivation eroded further, creating long-term barriers to academic resilience and self-directed learning.

Social Relationships

As screen time increased, many children experienced fewer face-to-face interactions with both parents and peers, which slowed the development of skills such as language, self-regulation, and social-emotional functioning (Ghaisani & Salam, 2022; Radesky et al., 2014; Stienwandt et al., 2022). This decline in in-person interaction began early in development and appeared to have long-term effects on school readiness and overall social competence (Crowell, 2021; Jourdren, 2023; Santos et al., 2022).

Social media platforms have contributed to cycles of feedback-seeking, status competition, and social comparison, which are linked to increased emotional distress, risky behaviors, and dissatisfaction in social relationships (Nesi & Prinstein, 2018; Haag et al., 2024). While gaming and remote interaction allowed children to maintain social connections during periods of isolation, these patterns also heightened the likelihood of addictive behaviors, reduced face-to-face engagement, and raised broader developmental concerns (Rosendo-Rios et al., 2022; Wu et al., 2024; Pandya & Lodha, 2021). Although digital media created new avenues for connection, existing research suggested that excessive or emotionally driven digital social interaction carried significant trade-offs for children's development when not adequately managed. CASEL (2023) emphasized that building relationship skills and social awareness directly supports the restoration of peer interactions, perspective-taking, and communication affected by excessive digital consumption.

Childhood Screen Use and Social Skill Displacement

As digital media became more accessible to children at younger ages, concerns have grown about its impact on children's early in-person social development. One of the first areas researchers have examined is how increased screen time can disrupt face-to-face parent-child interaction, a key contributor to emotional regulation and social learning in early childhood. Ghaisani and Salam (2022) discussed how screen exposure reduces opportunities for parent-child play, word count exposure, and conversational exchange, which are key components of early social learning. When screens displaced shared activities like reading and talking, children were deprived of opportunities for

reciprocal engagement that fostered language development and emotional at-tunement (Ghaisani & Salam, 2022). Reduced exposure to adult speech, back-and-forth conversation, and joint attention likely hindered the development of foundational social skills. This reduction in meaningful interaction may have lasting effects on children's emotional and behavioral development.

   This decline in meaningful interaction was not without consequence. Infants and toddlers depend on caregiver responsiveness to develop basic be-havioral strategies for managing distress and navigating social contexts (Beatty & Egan, 2020; Kerai et al., 2022). Crowell (2021) explained that during infancy, children begin developing behavioral strategies to manage their emotions in response to their environment. Early emotional coping mechanisms are learned through repeated caregiver exchanges, many of which are interrupted or re-placed by screen exposure (Crowell, 2021; Bandura, 2001). In this way, exces-sive screen use undermined the real-world emotional practice children required for adaptive development. When screen time replaces caregiver interaction, in-fants may miss opportunities to build these emotional regulation strategies in real-world situations. Similarly, Halpin (2021) and Kerai et al. (2022) proposed that diminished parent-child engagement served as a key mechanism linking high screen use to later psychosocial difficulties, particularly when devices dis-placed face-to-face responsiveness and emotional co-regulation. This pattern may occur because screens often displace shared activities, diminishing parental engagement and the type of back-and-forth responsiveness that supports so-cioemotional development (Kerai et al., 2022).

   These patterns extended beyond the home and into early peer experi-ences. Beyond the family context, screen-based activities may hinder children's opportunities to interact with others during early developmental stages. As digital media time increased, children had fewer opportunities for in-person interaction with peers, especially during the early developmental stages when such experiences are crucial for socioemotional skill development. Independent screen use often replaced developmentally rich contexts like board games, out-door play, or shared storytime, which support empathy, conflict resolution, and emotional communication (Santos et al., 2022). Without these informal social exchanges, children may have entered school with limited experience in navi-gating complex peer dynamics. Stienwandt et al. (2022) found that this kind of screen-based displacement was associated with reduced family functioning and less engagement in prosocial learning environments. Beatty and Egan (2020) raised additional concerns about how screen immersion at a young age could alter the developmental trajectory of children's interpersonal skills over time.

   In addition to displacing real-world social experiences, early screen use has also been linked to delays in language and socioemotional development. Children who spent more time with screens demonstrated weaker vocabulary, slower language acquisition, and reduced communicative confidence (Jourdren, 2023). Jourdren (2023) also observed that excessive screen exposure slowed lan-guage skill development, which affected children's ability to engage socially with

peers. Radesky et al. (2014) found that early exposure to screen media, particularly before age three, was associated with long-term difficulties in language, executive functioning, and academic readiness. These deficits undermined school participation and hindered the ability to build relationships within classroom settings (Stienwandt et al., 2022). These challenges often limited their ability to engage successfully with peers, particularly in situations that required emotional expression or negotiation in the classroom.

Behavioral outcomes also played a critical role in social interactions. The relationship between screen exposure and externalizing or internalizing behaviors has also been identified in recent research. Higher levels of screen time were associated with increases in both internalizing behaviors, such as withdrawal, and externalizing behaviors, including impulsivity and aggression (Eitrich et al., 2022). These emotional and behavioral dysregulations interfered with children's ability to develop and maintain friendships. Children's relationships were influenced by difficulties in emotional regulation and impulse control, resulting in adverse effects on their interactions with classmates and friends. Additionally, Tamana et al. (2019) found that children who exceeded two hours of daily screen use were significantly more likely to meet diagnostic criteria for ADHD, a condition commonly associated with peer rejection and interpersonal challenges.

Much research suggested that excessive screen exposure during early childhood disrupted the very interactions necessary for healthy social development. Parent-child responsiveness, peer engagement, language growth, and behavioral regulation were all negatively impacted when screen time displaced real-world opportunities for connection. Increased screen exposure in childhood may displace key opportunities for social interaction with parents and peers, delay the development of language and emotional regulation skills, and contribute to behavioral issues that may impair children's ability to build and maintain relationships (Radesky et al., 2014). While additional longitudinal research is needed to fully understand the long-term implications, the current literature consistently pointed to a developmental tradeoff. Increased screen time often came at the expense of foundational interpersonal skills.

Digital Coping and Online Peer Challenges

While excessive screen use disrupted children's face-to-face social development, it also introduced distinct challenges within online interactions. These emerging challenges for children and adolescents, who increasingly turned to digital spaces for connection, experienced heightened vulnerability to problematic internet use (PIU), digital status seeking, and online social comparisons. A growing field of research examines how PIU may act as a coping mechanism for children who experience difficulties with emotional regulation. PIU functioned as a maladaptive coping strategy, especially for children with limited emotional support at home. Gioia et al. (2021) found that children who struggled with emotional regulation often gravitated toward excessive internet use to manage distress, particularly in contexts where caregiver involvement was

inconsistent or absent. In families where parental support is limited or inconsistent, children may be more susceptible to using online environments as a means to escape or regulate their emotions (Gioia et al., 2021). These digital behaviors offered momentary distraction but rarely addressed the underlying emotional needs, instead reinforcing cycles of withdrawal and internalizing symptoms.

When protective relational buffers, such as engaged parenting or stable friendships, were lacking, children were more likely to use digital media as a compensatory space. Gioia et al. (2021) described how individuals who have difficulty managing their emotions may be drawn to online activities because these activities provide an alternative space for coping with emotional distress. However, these virtual environments often intensified rather than alleviated emotional challenges. This type of coping did not lead to improved well-being. Instead, it reinforced a cycle of problematic use that contributed to further emotional and social difficulties. Haag et al. (2024) found that higher social media use was associated with poorer peer relationships, increased risk-taking behaviors, and greater vulnerability to mental health issues like depression and anxiety. The reduced presence of protective factors, such as strong family or friend support, seemed to leave children more susceptible to excessive social media engagement (Haag et al., 2024). In these contexts, children's online habits became both a symptom and a driver of emotional dysregulation, with minimal external supports to disrupt the cycle.

Beyond problematic use, many children found themselves entangled in online dynamics centered on comparison and validation. Many children and adolescents faced pressures related to digital social comparison and feedback-seeking behaviors. Social media introduced constant visibility into social interactions, creating opportunities for comparison-based distress. Nesi and Prinstein (2015) described how adolescents frequently monitored likes, comments, and follower counts as a form of technology-based feedback-seeking, which often contributed to depressive symptoms and lowered self-esteem. The constant monitoring of how many likes, comments, or followers they received led to an increasingly dependent sense of self-worth on these digital affirmations (Nesi & Prinstein, 2015). This cycle of comparison can be emotionally taxing, especially when children feel less socially successful than their peers. The foundational nature of social media platforms encouraged external validation, fostering environments in which children's self-worth became increasingly tied to digital metrics.

Nesi and Prinstein (2018) introduced the concept of digital status-seeking, which refers to the efforts to collect visible signs of popularity and approval online. These behaviors often amplified existing social anxieties, as youth compared their digital popularity to that of others and engaged in escalating efforts to preserve or enhance their online presence. As children invested more effort in cultivating these online identities, they experienced heightened social anxiety and became more vulnerable to engaging in risky behaviors to maintain status (Nesi & Prinstein, 2018). This constant striving for digital validation may

distort children's understanding of peer acceptance and friendship, making of-fline relationships feel less satisfying or meaningful by comparison. This pursuit of social capital online came at the expense of authentic connection, distorting adolescents' understanding of peer acceptance and making real-life interactions feel less rewarding or secure.

The cumulative effects of these online pressures impacted not only emotional well-being but also the depth and quality of friendships. The impact of social media on friendship quality has also been highlighted in recent studies. Haag et al. (2024) found that addictive smartphone use was associated with low-er friendship quality, suggesting that digital engagement may not fully replace or replicate the benefits of in-person bonding. The virtual relationships failed to replace the emotional intimacy of in-person friendships. In some cases, online relationships may even expose children to new forms of conflict. O'Keeffe et al. (2011) noted that online platforms often replicated and intensified offline social stressors, such as bullying and exclusion, leading to increased exposure to peer conflict and reputational harm. These findings underscored the dual nature of digital spaces. While offering new avenues for interaction, they also introduced unique relational risks that shaped how children understood and engaged in social relationships (Radesky et al., 2014; Nesi & Prinstein, 2018).

Contemporary Shifts in Modern Online Social Engagement

As children's social worlds increasingly migrated online, broader shifts emerged in how they interacted socially, through gaming platforms, pandem-ic-driven screen reliance, and ongoing digital engagement. Beyond general social comparison and problematic use, the changes in how children social-ly engage through digital media have continued to evolve. The role of online gaming is one area of growing concern in shaping children's social experienc-es. While gaming environments offered opportunities for connection through shared play, they also introduced new risks for social withdrawal and screen overdependence. Rosendo-Rios et al. (2022) defined online gaming addiction as a persistent, recurrent pattern of gaming behavior that leads to distress or impairment in daily functioning. While some children used gaming to socialize with friends, others became more isolated as their gaming behaviors escalated (Rosendo-Rios et al., 2022). Although some children used gaming platforms to connect with friends, others became more socially isolated as their screen-based interactions replaced in-person social experiences.

The inherently immersive and socially reinforcing features of online games further blurred the line between healthy engagement and problematic use. While online games enabled players to interact through shared virtual en-vironments, this form of engagement did not entirely replace or replicate the benefits of in-person interaction. Rosendo-Rios et al. (2022) noted that online gaming's built-in social features may promote excessive screen time, blurring the lines between healthy socialization and problematic use. The built-in chat systems, multiplayer modes, and competitive ranking structures may increase the time spent gaming, potentially contributing to excessive screen exposure

(Rosendo-Rios et al., 2022). Over time, children who relied heavily on digital gaming as their primary means of interaction may miss opportunities to practice essential in-person social skills. They were less likely to practice essential face-to-face social skills such as reading emotional cues, resolving conflicts, or navigating group dynamics (Rosendo-Rios et al., 2022). Even when social interaction occurred virtually, it often lacked the richness and developmental benefits of real-world interpersonal engagement.

The COVID-19 pandemic accelerated many of these digital shifts when children's access to in-person interactions became severely restricted. Widespread school closures, reduced extracurricular activities, and prolonged periods of remote learning forced many children to turn to screens for social connection. Wu et al. (2024) documented increases in recreational screen overuse and parallel declines in psychological well-being. Similarly, gaming addiction saw a significant rise during the pandemic, as remote schooling and limited outdoor activities left children with fewer options for peer interaction (Rosendo-Rios et al., 2022). These findings suggested that, while technology served as a necessary substitute to maintain social contact, its long-term effects on children's social functioning remained troubling. Pandya and Lodha (2021) highlighted the paradox that while they offered emotional relief and continuity of social interaction during lockdowns, they also risked fostering dependency, emotional dysregulation, and weakened peer competence. This concern extended beyond temporary overuse, as some children emerged from the pandemic with entrenched digital habits that prioritized screen-mediated relationships over face-to-face interactions.

Especially after the pandemic, children's social lives increasingly intersected with digital platforms. Many began to form emotionally meaningful connections with media figures, a phenomenon known as parasocial relationships (PSRs). These online, one-sided relationships with celebrities, influencers, or fictional characters offered children the illusion of companionship and social intimacy (Bond et al., 2025). While not inherently problematic, PSRs served as substitutes for social relationships, particularly for children with limited access to interpersonal socialization. For children navigating social isolation due to personal, familial, or societal conditions, such as the COVID-19 pandemic, PSRs may fulfill social needs that are otherwise unmet (Bond et al., 2025; Mendelson & Smith, 2024).

PSRs often begin in early childhood and can evolve into emotionally complex attachments. Young children are especially susceptible to forming strong bonds with relatable or nurturing characters, such as those found in educational media or family vlogs (Brunick et al., 2016; Smith & Mendelson, 2024). These relationships, while developmentally typical, may influence children's expectations for real-life friendships. For example, children who regularly consume influencer parenting content may begin to equate performative, idealized interactions with their personal caregiving relationships. The rise of "internet parents," who stage family-oriented content, introduces a new kind

of digital attachment in which children emotionally invest in families they do not know personally (Mendelson & Smith, 2024). This type of attachment may skew children's perceptions of healthy relationships and foster unrealistic ideals about family dynamics or social acceptance.

While PSRs can support learning and social-emotional growth—especially when children identify with positive, prosocial figures—these relationships can also reinforce unhealthy ideals. For instance, children who idolize influencers promoting unattainable lifestyles or appearance standards may internalize values rooted in materialism, physical perfection, or social status (Bond et al., 2025). While PSRs offer low-risk simulations of social interaction, they lack the reciprocal complexity of real-life relationships (Brunick et al., 2016). Children who rely heavily on media figures for emotional reassurance may struggle to interpret social cues, resolve conflicts, or tolerate ambiguity in social settings. Although PSRs can offer temporary solace, especially for children who feel misunderstood or excluded, they may unintentionally inhibit the development of authentic social intimacy and collaborative problem-solving.

Summary

This chapter reviewed the current literature surrounding the impact of recreational screen time on the social-emotional development of elementary-aged children, focusing on three key areas: self-regulation, motivation, and social relationships. Research indicates that excessive screen use may interfere with children's ability to manage emotions, maintain attention, and control their behavior, while also contributing to diminished academic motivation, weakened self-efficacy, and reduced persistence in learning. Additionally, the literature demonstrated how digital media may disrupt children's relationships by reducing face-to-face interactions, promoting problematic internet use, and altering patterns of social engagement in the digital era.

In self-regulation, early and excessive screen exposure undermined the development of self-regulation. Cumulative evidence suggested that frequent, passive, and unsupervised screen use during early childhood interfered with self-regulatory skill acquisition by displacing caregiver interaction, reducing emotional learning opportunities, and reinforcing external regulation strategies. The literature demonstrated that excessive and early screen exposure disrupted the development of self-regulation in elementary-aged children. This disruption emerged across multiple domains, including attention control, emotional regulation, and behavioral inhibition. Early screen exposure interfered with foundational caregiver-child interactions, reduced opportunities for emotional learning, and shifted regulation externally to devices rather than supporting the development of intrinsic coping mechanisms. The nature of screen engagement played a critical role, as passive and fast-paced content was strongly associated with adverse outcomes, while caregiver-mediated, interactive, and educational content offered some protective benefits. Attention dysregulation emerged as a primary mechanism linking screen exposure to broader self-regulatory difficulties, with rapid cognitive shifting, displaced playtime, sleep disruption, and emo-

tional reactivity compounding these effects. Parenting practices, family media environments, and socioeconomic conditions also influenced these outcomes, with parental scaffolding and co-viewing serving as protective factors, while parenting stress, inconsistent media boundaries, and structural inequalities exacerbated risks. Together, the research highlighted the complex and multidimensional ways that screen time influenced self-regulation, emphasizing that both the quantity and context of media exposure shaped developmental trajectories.

In academic motivation, the literature suggests that screen exposure negatively impacts motivation, not only through direct effects on academic engagement but also through disruptions to cognitive load management, executive function, and self-efficacy. These cognitive processes are foundational for children's ability to sustain attention, resist distractions, and persevere through complex learning tasks, all of which are essential to academic motivation. Screen engagement had a direct influence on academic motivation and achievement, with passive and unregulated screen use contributing to academic disengagement. Conversely, interactive and educational media offered opportunities to support learning when properly designed and supervised.

In social relationships, screen time offered new opportunities for social interaction, but they may also foster problematic patterns of comparison, emotional sensitivity, and dependence on external validation. As children increasingly manage their digital identities, their offline social relationships may decline in both quality and stability. The literature explored how gaming, pandemic-era changes, and broader shifts in technology use have continued to transform children's social dynamics and development. More broadly, the overall nature of interaction has shifted with the rise of digital technology. Radesky et al. (2014) emphasized that the ubiquity of digital devices has altered how children and adolescents interact with one another, often reducing the time spent in unstructured, face-to-face interactions that historically served as the foundation for developing empathy, cooperation, and conflict resolution. As technology increasingly transforms children's interactions with others, research consistently showed that while digital platforms create new connection opportunities, they also presented significant risks such as social withdrawal, developmental delays, and emotional issues that could undermine children's social competence over time.

These findings provided a comprehensive understanding of the potential social-emotional risks associated with early and extended screen exposure. In Chapter 3, the implications of these findings will be discussed, including conclusions drawn from the literature, practical applications for educators and families, policy recommendations, and suggestions for future research to further explore this growing area of concern.

Chapter 3: Implications
Introduction

The growing ubiquity of recreational screen time in the lives of elemen-

tary-aged children has prompted widespread concern among educators, parents, and researchers regarding its long-term effects on child development. A growing body of evidence suggests that screen time is a significant factor influencing children's emotional regulation, academic motivation, and social relationships during their formative developmental years (Burnell et al., 2022; Gioia et al., 2021; Santos et al., 2022). These concerns are particularly relevant when screen use becomes excessive and unstructured, displacing face-to-face interactions and reinforcing reactive, reward-driven behavioral patterns. Drawing from Bandura's (1986) Social Learning Theory, this study considers the developmental consequences of frequent exposure to screen-based models and environments, where children may internalize digitally mediated norms of behavior, emotion, and interaction.

This chapter discusses the implications of these findings for educational practice, family engagement, and future research. Specifically, the investigation examined how excessive recreational screen use affects three major social-emotional developmental areas: students' ability to self-regulate, their motivation in academic contexts, and the quality of their social relationships. Three focal points guided the research questions. How does excessive screen time affect the self-regulation of elementary-aged students? How does it influence their motivation and persistence in academic environments? How does it shape the development and maintenance of social relationships?

These questions emerge from the urgent need to understand how the digital landscape is altering children's day-to-day learning experiences and emotional well-being. The literature reviewed in Chapter 2 suggests that high levels of screen engagement may hinder children's ability to delay gratification, focus attention, and respond appropriately in social contexts (Haag et al., 2024; Thorell et al., 2024). Similarly, screen-based interactions often reinforce external validation and immediate reward systems that conflict with the development of intrinsic motivation and task persistence in the classroom (Twenge & Campbell, 2018). Furthermore, children's social development appears to be increasingly shaped by digital communication, connections, and interactions that potentially distort their understanding and experience of real-world relationships (Brunick et al., 2016; Nesi & Prinstein, 2018).

The elementary years represent a critical window for the development of self-regulation, social competence, and academic engagement. As such, the findings of this study hold implications not only for individual learning outcomes but for the broader systems of families, schools, and communities that support child development. The remainder of this chapter can inform instructional strategies, guide parental decision-making, and influence policy efforts aimed at promoting healthy digital habits and protecting children's developmental trajectories in an unavoidably screen-saturated world.

Conclusions

These findings from the literature review reveal a consistent pattern. Excessive recreational screen time is strongly associated with developmental dis-

ruptions across multiple social-emotional domains in elementary-aged children (Kerai et al., 2022; McArthur et al., 2022; Streegan et al., 2022). One of the concerning aspects is its impact on self-regulation, a foundational skill for emotional and behavioral control. High levels of screen use are correlated with diminished self-monitoring abilities, increased emotional reactivity, and reduced impulse control (Konok et al., 2024; Mallawaarachchi et al., 2024). These impairments are especially consequential during early childhood, a period when children are susceptible to environmental inputs that shape emotional regulation systems (Madigan et al., 2019). Through the framework of Social Learning Theory, children often observe and internalize rapid, emotionally charged behaviors modeled in screen content, especially when those behaviors are reinforced (Bandura et al., 1961; Konok et al., 2024). Such observational learning may contribute to the erosion of self-regulatory capacity, as children are repeatedly exposed to impulsive and reactive digital models.

In the academic domain, motivation is similarly compromised by overexposure to screen-based media. Recreational screen time displaces developmentally beneficial behaviors, such as reading, problem-solving, or sustained academic engagement, thereby diminishing children's confidence in their own learning abilities (Gong & Tao, 2024; Kerai et al., 2024). Additionally, cognitively demanding and fast-paced screen content has been shown to overload attention systems and reduce the ability to persist through effortful or delayed-reward tasks (Lillard & Peterson, 2011; Walsh et al., 2013). Bandura's (1986) concept of vicarious reinforcement further contextualizes these trends. When children repeatedly observe digital behaviors that are immediately rewarded, they may adopt a performance orientation driven by external rewards, rather than cultivating intrinsic motivation or resilience in academic contexts.

Social relationships are also significantly affected. Excessive screen use reduces opportunities for in-person interaction, undermines peer engagement, and contributes to increased reliance on digital forms of social comparison and feedback (Gioia et al., 2021; Nesi & Prinstein, 2018). Children immersed in online environments often engage in problematic internet use, feedback-seeking behaviors, and parasocial attachments that distort their understanding of healthy social relationships (Gioia et al., 2021; Mendelson & Smith, 2024). These patterns are consistent with Bandura's (1986) assertion that much of children's social knowledge is acquired through modeled behavior. In the digital context, peers and parasocial figures may serve as these social models that promote unrealistic expectations of acceptance and validation. As children imitate these behaviors and seek digital markers of popularity, their capacity for authentic, reciprocal friendships may weaken. The effects are compounded when children are not provided with compensatory in-person social experiences or guidance from adults to mitigate these distortions (Haag et al., 2024).

The literature strongly suggests that screen time functions as a modeling system, as an environment in which young learners observe, imitate, and internalize behaviors, motivations, and relational patterns. Bandura's (1986) Social

Learning Theory offers a valuable explanatory framework for understanding how screen time influences children's social-emotional development through the processes of observational learning and vicarious reinforcement. The cumulative findings of the study suggest that excessive recreational screen time has measurable consequences for the development of self-regulation, motivation, and social relationships, all of which are foundational for healthy academic and emotional functioning in childhood and in the classroom.

Practice Implications

The findings of this study indicate significant social-emotional challenges for elementary-aged students who are exposed to excessive recreational screen time. In the classroom, these challenges often manifest as difficulties with self-regulation, diminished academic motivation, and impaired social relationships. Educators are uniquely positioned to address these effects by implementing structured, evidence-based strategies that respond directly to the needs highlighted in this review.

To support self-regulation, one critical approach is the integration of social-emotional learning (SEL) programs in individual classrooms. These programs provide explicit instruction in emotional awareness, behavioral control, and interpersonal problem-solving. SEL competencies such as self-awareness and self-management are foundational for helping students understand and regulate their emotions, set and achieve personal goals, and demonstrate self-discipline (Collaborative for Academic, Social, and Emotional Learning [CASEL], 2023). Programs that systematically teach emotional regulation skills have been shown to improve children's ability to manage impulses and recover from emotional dysregulation (Burnell et al., 2022). Embedding these lessons into the daily routine reinforces the real-world application of SEL principles and provides consistent opportunities for students to observe and practice regulated behaviors. Given that screen content often models impulsivity and reactivity, the classroom must serve as a corrective space where students encounter and internalize models of emotional restraint, empathy, and reflective thinking (Bandura, 1986). In addition to SEL, educators can integrate digital literacy education into their instruction. Lessons that teach students how to critically evaluate digital content, set boundaries around screen use, and understand the implications of media exposure can empower children to make more informed choices about their screen habits (Streegan et al., 2022). Teaching digital literacy alongside SEL reinforces a holistic view of self-regulation that includes both online and offline behaviors.

Another practical implication involves addressing the motivational challenges linked to excessive screen use. According to CASEL (2023), self-management is an essential skill for sustained academic engagement, cultivating self-motivation and working towards personal and collective goals. Digital platforms tend to reward instant gratification, constant novelty, and external validation, which can undermine intrinsic motivation and persistence in academic tasks (Bandura, 1986; Gong & Tao, 2024). To counteract the demotivating

effects of screen use, educators can foster classroom cultures that emphasize effort, resilience, and self-efficacy. Instructional strategies such as goal-setting, process-focused feedback, and explicit modeling of a growth mindset can reinforce this self-efficacy and encourage internal satisfaction from meaningful progress (CASEL, 2023). When educators support students in recognizing the personal rewards of perseverance and problem-solving, they contribute to the development of self-directed learners who are less reliant on the external reinforcements embedded in digital media.

To mitigate the social effects of screen-based displacement, classrooms should intentionally structure opportunities for peer interactions through cooperative learning, partner discussions, and conflict-resolution frameworks. Excessive screen time can reduce children's practice with emotional reciprocity, conflict resolution, and verbal communication, which are skills that are essential for forming and sustaining relationships (Santos et al., 2022). CASEL (2023) emphasizes the importance of relationship skills and social awareness, including the ability to communicate effectively, empathize with others, and resolve conflicts constructively. Educators can address these gaps through cooperative learning structures, partner discussions, and classroom frameworks that normalize respectful disagreement and emotional expression. Explicit instruction in perspective-taking, respectful disagreement, and emotional expression can help rebuild these foundational peer skills. Morning meetings, restorative circles, and peer mentoring can also create consistent and supportive opportunities for social engagement and the practice of prosocial behaviors. These practices not only restore essential peer interactions but also empower students to navigate diverse social settings with confidence and compassion, critical outcomes in both academic and personal domains.

Ultimately, educators can increase their impact by engaging families in initiatives aimed at reducing excessive screen time. Teachers can build parent partnerships by aligning classroom SEL instruction with take-home digital habits and involving families in co-creating screen-free routines. Providing parents with education on healthy screen habits, co-viewing strategies, and structured home routines aligned with pediatric recommendations reinforces a cohesive and consistent message across school and home settings (American Academy of Pediatrics [AAP], 2016; Caballero-Julia et al., 2024; Konca, 2021). CASEL (2023) underscores the importance of engaging families and caregivers as essential partners in cultivating supportive environments for students' social and emotional learning. When families are informed and supported, students benefit from aligned expectations that promote emotional development, responsible decision-making, and positive peer relationships (Karani et al., 2022; Madigan et al., 2020; Streegan et al., 2022). Educators play a pivotal role in guiding and supporting families as they navigate the challenges of screen use. Research consistently showed that children's digital habits are heavily influenced by parental modeling and the broader media environment in which they are raised (Konca, 2021; Konok et al., 2022; Mallawaarachchi et al., 2024; Stienwandt et al., 2022).

When caregivers frequently use screens or provide devices to manage child behavior, they unintentionally reinforce avoidant coping strategies and diminish opportunities for emotional learning (Halpin, 2021; Lauricella et al., 2015; Stienwandt et al., 2022). Moreover, increased screen exposure is often linked to reductions in parent-child interaction, shared play, and verbal engagement, which are essential for building empathy, language skills, and emotional regulation (Ghaisani & Salam, 2022; Kerai et al., 2022; Radesky & Christakis, 2016). These relational contexts cannot be replicated through passive media consumption, and their absence may increase the risk of emotional dysregulation and social difficulties in children.

Individual educators can encourage parent education initiatives that emphasize the importance of intentional screen time routines and active co-viewing practices. Educators are well-positioned to offer families developmentally appropriate guidelines and resources that address not only screen time limits but also the quality of content and the importance of relational engagement. Studies show that when parents set consistent boundaries and engage in discussions about media content, children demonstrate better emotional and behavioral outcomes (AAP, 2016; Mallawaarachchi et al., 2024; Stienwandt et al., 2022). This is particularly important in the context of children's increasing attachment to digital influencers and parasocial figures, which can blur the lines between entertainment and social modeling (Brunick et al., 2016; Smith & Mendelson, 2024). By equipping families with practical strategies and a deeper understanding of screen influence, educators can help foster healthier digital habits that align with children's social-emotional development.

Policy Implications

The findings from this study highlight an urgent need for school districts and policymakers to address the widespread impact of excessive recreational screen use on children's social-emotional development. Schools should begin by establishing clear, developmentally appropriate guidelines for recreational screen use, particularly during unstructured periods such as recess, indoor breaks, before school, and after school. Research indicates that unregulated screen exposure during these times often replaces valuable peer interaction, play-based learning, and prosocial engagement (Cerniglia et al., 2021; Konok et al., 2024; McArthur et al., 2022; Stienwandt et al., 2022). To prevent this displacement, policies should focus on promoting active, collaborative alternatives and establishing screen-free zones or routines that prioritize interpersonal development. These efforts should be supported by teacher training on managing digital transitions and designing classroom routines that balance technology use with opportunities for interpersonal growth and development.

Family involvement is equally critical. The AAP (2016) advocates for family media plans and caregiver engagement to mitigate risks. Schools can help bridge the gap by offering parent workshops, sending home screen time contracts, or integrating digital literaMcy into parent communication platforms. Policies should support school-wide digital wellness education initiatives for care-

givers that address media modeling, co-viewing strategies, and age-appropriate boundaries (Caballero-Julia et al., 2024). Parental modeling has been shown to significantly influence children's own digital habits and emotional development (Lauricella et al., 2015; Konok et al., 2024).

Beyond the school environment, this study supports the integration of district-wide SEL curricula that explicitly address self-regulation, emotional wellness, and attention management. Mandating SEL programs at a high level ensures that all students, regardless of community or access, develop the skills to navigate digital and real-world emotional challenges. As CASEL (2023) emphasizes, evidence-based SEL curriculum can strengthen self-awareness, build empathy, and reduce externalizing behaviors often exacerbated by screen immersion. State and federal education agencies should allocate funding toward comprehensive SEL programs. These initiatives have demonstrated effectiveness in supporting emotional regulation, self-efficacy, and relationship-building skills, which are often undermined by excessive screen time (Beatty & Egan, 2020; Burnell et al., 2022; Gioia et al., 2021). Integrating SEL with digital wellness efforts will help schools create protective structures that foster emotional resilience and positive peer interactions in an increasingly digital world. Additionally, districts and education boards should consider adopting media literacy curricula at the elementary level. These curricula can cultivate healthy digital habits and emotional awareness before children develop problematic patterns of media engagement.

Effective policy also requires collaboration between schools, families, and public health agencies. Policymakers should support partnerships between school districts and health organizations to deliver targeted education to families on healthy media practices, co-viewing strategies, and screen boundaries (Caballero-Julia et al., 2024). Parent workshops, media contracts, and family toolkits can empower caregivers to create developmentally appropriate screen routines that reinforce in-school efforts. By aligning policy, curriculum, and home supports, schools and districts can create a comprehensive environment that promotes digital wellness and socioemotional resilience in a media-saturated era.

Directions for Future Study

While the current review highlights clear patterns of the impact of excessive screen time on the social-emotional development of elementary-aged children, it also has limitations. Despite the growing body of research on screen time and child development, several methodological limitations continue to constrain the field. One of the most persistent challenges is the lack of conceptual clarity surrounding what constitutes "screen time." Many studies fail to distinguish between different types of screen engagement, such as passive viewing, interactive gaming, educational use, or social media consumption, which may yield varied developmental outcomes (Haag et al., 2024; Madigan et al., 2019; Rideout et al., 2025). Additionally, much of the existing literature relies heavily on self-reported data from parents or children, which is often subject to recall bias and social desirability effects, reducing the reliability of reported screen use

(Lauricella et al., 2015; Gioia et al., 2021). These limitations hinder the field's ability to draw precise conclusions about the nuanced impacts of screen use across different developmental domains. To achieve more rigorous and nuanced insights, future research should adopt objective, context-sensitive methods for measuring screen time. Emerging approaches, such as digital usage tracking and time-stamped behavioral logs, may provide a more accurate and detailed picture of how children engage with screen-based media in real-world settings (Konok et al., 2024; Haag et al., 2024). Such tools would enable researchers to more accurately differentiate between screen contexts and durations, examine usage patterns over time, and investigate the interplay between screen use and environmental factors. Addressing these methodological limitations is essential for advancing the field and developing tailored, evidence-based recommendations for families, educators, and policymakers.

There is a lack of research that addresses the rise of short-form, fast-paced content, such as TikTok, Instagram Reels, and YouTube Shorts. These platforms, now central to many children's digital lives, prioritize algorithm-driven entertainment, rapid consumption, and emotionally charged content (Gong & Tao, 2024; Rideout et al., 2025). Their emphasis on brief, high-stimulation content may train young users to expect constant novelty, potentially diminishing their capacity for delayed gratification, deep focus, or emotional regulation (Gong & Tao; 2024). However, their specific effects on social-emotional development have been lightly studied due to the relatively recent emergence of these platforms. Future research must measure the developmental implications of distinct screen contexts and content types. As digital environments continue to evolve, now with the integration and accessibility of artificial intelligence and personalized algorithms, future research must attend to the modern media landscape as it exists.

Another important gap lies in the cultural representation within screen time research. There is a pressing need to examine screen use across diverse cultural, linguistic, and socioeconomic groups, especially given the varying norms around parenting, media exposure, and educational access. Instead of solely broadening sample diversity for generalizability, future research should prioritize culturally specific studies that examine the unique experiences of ethnic or cultural groups. This approach would treat culture or ethnicity as a contextual lens over a demographic variable, illuminating how cultural values, language practices, and access to resources influence screen use and its developmental impacts. Children from diverse backgrounds may engage with screen media in different ways, sometimes using it to maintain cultural ties or language learning, while also facing unique barriers to regulated use. These differences may shape how screen time affects development and inform the design of interventions. Culturally responsive research would offer a more nuanced understanding of how digital habits and their impacts differ across communities.

Summary

Excessive recreational screen time presents significant challenges to the

healthy social-emotional development of elementary-aged students. Across the literature, consistent evidence links screen use with impaired self-regulation, diminished intrinsic motivation, and weakened social relationships (Gioia et al., 2021; Haag et al., 2024; Konok et al., 2024). These effects are especially concerning given the rapid emergence of short-form digital media that dominates children's screen use today (Rideout et al., 2025). The developmental risks are compounded when screens displace opportunities for emotional learning, active play, and interpersonal connection during formative years (Burnell et al., 2022; Madigan et al., 2019).

Educators play a pivotal role in mitigating these effects by implementing evidence-based strategies that promote self-regulation, emotional resilience, and digital literacy. Structured SEL programs, classroom routines that reduce reward-seeking behavior, and explicit instruction on healthy media habits offer promising pathways for supporting students in navigating their digital worlds (CASEL, 2023; Streegan et al., 2022). Equally important are policy reforms that promote screen use guidelines in schools, fund SEL initiatives, and integrate media literacy education at the district and national levels (AAP, 2016). These systemic supports can help align school environments with developmental best practices in this digital age.

As screen use and technology continue to evolve, there is an urgent need for research that keeps pace with the lived experiences of children. Future investigations should focus on specific media, examine screen use across diverse cultural and socioeconomic backgrounds, and address how evolving screen habits affect long-term developmental trajectories. Future generations should be educated while considering today's technological revolution and reformulating digital literacy mechanisms. With the findings from this literature review and future studies, educators, families, and policymakers can work together to safeguard children's social-emotional development and foster more balanced, connected, and healthy learning environments.

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The Impact of Study Skills on Adolescents' Academic Achievement

Micah Hernandez

Abstract

In this dissertation, I share the results of a study in which I examined how one's writing achievement changes when self-regulated learning (SRL) methods (self-assessment, goal setting, and reflective writing) are taught to adolescents. While the demands of writing increase with each academic year in grades 6–12, most adolescent students do not have the study skills required to achieve success in their writing classes. However, research has pointed to the value of metacognitive practices to promote student independence, confidence, and performance, and there is less knowledge on how these practices work in the long term or across diverse students. This study explored whether SRL methods might be used to not only support students' performance, but also as developmental assets in writing instruction.

The study was grounded in Bandura's self-efficacy theory and Zimmerman's SRL model. The intervention examined the impact of goal-focused writing instruction within an autonomy-supportive and responsive feedback classroom environment. The study found that students who set goals and subsequently self-assessed and reflected on revisions had significantly improved writing performance, motivation, and self-belief compared to their classroom-mates. SRL interventions, like those demonstrated in this study, proved to be even more impactful on student achievement when SRL strategies were applied as long-term instruction practices.

The study's contribution includes recommendations for classroom practice and school policy as well as suggestions for future research. Future work should explore how digital tools and tools in diverse learning contexts might help support the long-term development of SRL writing.

Chapter 1: Introduction to the Project
Background

Study skills consist of diverse strategies and habits that enable students to gain knowledge while retaining and applying academic concepts. Time management, organizational abilities, goal-setting practices, and motivation each serve as essential elements that contribute significantly to student success. According to Schweder et al. (2022), self-efficacy, goal setting, and learning context serve as key motivational factors that determine student success in completing tasks. The presence of self-efficacy, goal setting, and

learning context influences students to either adopt mastery-focused methods or performance-centered behaviors, which could block their long-term development. Understanding how these motivational elements interact to support achievement, particularly among adolescent learners ages 10 to 19, is crucial as educational settings increasingly integrate self-directed and self-regulated learning (Elhusseini et al., 2022; Philippakos & MacArthur, 2020).

Research shows that self-regulation serves as a critical factor in achieving academic achievement, with particular importance in writing ability. Zumbrunn et al. (2020) and Tadlock (2020) emphasized that students' confidence in their writing abilities affected their writing performance. When adolescents are confident in their capabilities, they tend to adopt self-regulation strategies that enhance their writing and academic achievement. Research demonstrates that goal setting plays an essential role in the development of self-regulation strategies (Wilson et al., 2023). Aitken and Halkowski's (2024) study, which included adolescent participants, showed that writing outcomes improved when students set their own writing goals because these goals enhanced functional writing elements within persuasive writing tasks.

The learning environment proves essential in influencing students' motivation. According to Schweder et al. (2022), self-directed learning environments better support mastery goals and self-efficacy development and promote positive emotions than teacher-directed environments. Student motivation improves when students gain more learning autonomy, and this effect is particularly pronounced among female students who show a preference for mastery goals (Schweder et al. 2022). Wilson et al. (2023) and Blackmon (2023) demonstrated that including goal-setting strategies in writing instruction improves adolescents' self-regulation skills and writing proficiency, regardless of instructional format. Although much of the existing research spans broad student populations, these findings remain relevant to adolescents in middle and high school settings.

A consistent relationship between motivation and writing performance has been documented across multiple studies. Wilson et al. (2023) showed that writing self-regulation and self-efficacy improved through combined goal-setting exercises and automated feedback and produced better writing achievements. Fien De Smedt et al. (2023) highlighted how writing motivation affects adolescents' ability to create persuasive and argumentative texts. According to research findings, motivation functions as both a success predictor and a facilitator throughout the writing process enabling students to manage writing task complexity (MacArthur, Philippakos, & Graham, 2016). Building on the significance of learning environments, specific learning strategies like goal setting and self-regulated learning have proven to be critical for writing success. Adolescents who set clear, specific writing goals and employ self-regulation techniques such as planning, monitoring, and revising consistently demonstrate improved writing quality and academic outcomes (Philippakos & MacArthur, 2020; Wilson et al., 2023). Students gain increased writing confidence through

these practices. While the measurable benefits of goal setting are widely recognized, research has not yet fully explored how these strategies function in environments that combine traditional teaching, automated feedback systems, and formative assessment tools (Philippakos & MacArthur, 2020; Wilson et al., 2023). While goal setting improves writing performance, the combined impact of automated feedback and formative assessment within traditional instruction remains under-investigated (Aitken & Halkowski, 2024).

Statement of the Problem

U.S. education faces a major challenge in developing adolescents' writing abilities, particularly among students aged 10 to 19, because many high school students graduate without the necessary skills to succeed academically or communicate professionally. Students, especially from underserved communities continue to experience difficulties with writing assignments because they lack essential self-regulation skills and motivation while struggling to set effective academic goals (Li, Johnsen, & Canelas, 2021). Students who have not developed foundational writing and planning skills typically struggle with complex writing tasks because they cannot establish essential planning and revision habits required for academic achievement (Zumbrunn et al., 2020). When motivation is absent, adolescents struggle with persistence, produce weaker writing, and lose opportunities for academic advancement. MacArthur, Philippakos, & Graham (2016) discovered that students with weak self-regulation skills tend to show minimal engagement in writing assignments while producing work that lacks organization and completeness. Adolescents from disadvantaged backgrounds encounter limited access to specialized teaching that focuses on goal setting and self-regulation skills which results in widening educational disparities through time (Cleary, 2018). Resolving these challenges is essential to enhancing writing results and ensuring long-lasting educational fairness for adolescent students. Students with writing problems face additional challenges when instructional approaches fail to consider their unique learning needs and preferences. Academic performance and preparation for higher education and employment both suffer from this problem. High school graduates continue to face writing proficiency challenges because educational systems fail to deliver individualized support and feedback that develops students' motivation and writing skills (Banat, 2022).

The study by MacArthur, Philippakos, and Graham (2016) demonstrates the essential need to design writing interventions that account for adolescents' unique motivational characteristics and cognitive processes. Banat (2022) supports Exploratory Practice as a method to develop student independence and self-awareness in their learning processes. Exploratory Practice represents a classroom-based research methodology which enables teachers and students to examine learning environment issues to enhance understanding and improvement of the learning process (Allwright, 2003). To create successful educational strategies that meet diverse student needs, instructors must understand and address gender differences along with learning preferences and

motivational traits (Schweder et al., 2022). To improve student achievement educators must deeply understand how motivation and self-efficacy intersect with goal setting and writing performance. When educators include motivational strategies like self-regulation and personalized goal setting within their writing courses, they create a learning environment that both engages students and enhances effectiveness. The growing body of research makes it clear that student motivation goes beyond performance enhancement because it establishes conditions that enable every student from different diverse backgrounds and learning contexts to achieve success.

Purpose of the Project

The purpose of this study is to investigate how goal setting, self-regulation, and motivation affect writing outcomes for students, with a specific focus on adolescents aged 10 to 19 and examines differences between teacher-directed instruction and self-directed learning approaches. The study aims to determine how goal-setting interventions alongside automated feedback and metacognitive practices can enhance writing ability and increase student involvement. The study will examine results from flipped learning contexts which reveal that instructional designs combining structured elements with flexibility help cultivate student independence and self-regulation skills essential for developing writing proficiency (Çakiroglu & Öztürk, 2021). The development of writing skills generates significant educational and societal advantages by enhancing academic achievement and preparing students for successful higher education and professional careers (Zumbrunn et al., 2020).

The focus on literacy within adolescent education has risen, but students still face difficulties achieving writing proficiency essential for academic and professional success. Studies show that self-regulated learning (SRL), structured goal setting and formative feedback are vital methods to enhance student writing performance (Tadlock 2020; Zumbrunn et al. 2020). Research demonstrated that student autonomy paired with learning process awareness creates stronger academic habits and student engagement (Banat, 2022). Research confirms the immediate benefits of self-assessment and goal setting while noting the absence of studies investigating their academic outcomes over long durations. Existing research examines short-term improvements in student writing but lacks studies that investigate the long-term effectiveness of these writing strategies and their lasting benefits for writing improvement. The secondary English classroom setting has notable research deficiencies that demand greater investigation especially since student writing development tends to stagnate in these environments. Considering these gaps, this project seeks to answer the following research questions:

Does self-assessment enhance the writing performance of adolescents?

Does the application of goal setting and planning processes enhance the writing abilities of adolescents?

Do adolescents show different writing outcomes when they practice reflection before and after the revision process?

Theoretical Framework of the Project

This study builds upon Albert Bandura's theory of self-efficacy which establishes that people's self-beliefs about their ability to succeed contexts critically influence their approach to goals and tasks (Bandura, 1997). Self-efficacy theory serves as a conceptual connector linking students' internal beliefs with their actual academic achievements. In this project, Bandura's framework will guide the exploration of metacognitive strategies like goal setting and self-assessment, which boost confidence and engagement over time. Bandura (1986) emphasized that individuals possessing strong self-efficacy tend to approach challenging tasks as opportunities for personal development instead of threats they need to avoid. Individuals with high self-efficacy demonstrate stronger motivational drive and resilience to overcome academic challenges. Applying this perspective to adolescent writing instruction, students who set clear objectives and engage in self-assessment practices develop a stronger internal sense of control over their learning process. A developed sense of control over learning helps students achieve sustained progress in skill development, particularly in writing, because progress in writing requires steady reflection and continuous improvement. Expanding Bandura's foundational theory, Zimmerman (2000) identified self-regulated learning as a critical factor in academic success. His research showed that successful students planned, monitored, and evaluated their learning, and that goal setting served as a key metacognitive strategy. Paris and Paris (2001) further showed that engaging in critical self-assessment encourages students to take ownership of their academic growth, resulting in higher motivation and achievement levels. Together, these perspectives emphasize the importance of metacognitive strategies in sustaining student progress. Although a strong body of research supports the connection between self-efficacy, goal setting, and academic achievement, notable gaps remain. Schunk and Swartz (1993) found better writing performance through short-term goal setting and self-assessment in students but did not investigate the sustainability of these improvements. Similarly, Andrade and Du (2007) determined that self-assessment practices produced immediate improvements in writing quality but did not assess long-term academic impacts. The limited examination of how these strategies affect writing development over extended periods highlights the need for further investigation.

This research investigates self-efficacy theory by going through an exploration of how continuous application of goal setting and self-assessment practices affects writing development over time. Through continuous reflection and goal-focused practice, students who build increased confidence in their writing skills will achieve better academic results and maintain these practices in their future educational and professional endeavors. Bandura's (1997) model identifies repeated mastery experiences as the prime method for increasing self-efficacy because they enable learners to see their own development. This study's theoretical basis suggests metacognitive strategies serve dual purposes by enhancing immediate writing performance and developing essential moti-

vation and belief systems for enduring educational success. Self-efficacy theory supports this project's evidence-based argument for schools to integrate self-assessment and goal setting in writing education as permanent developmental tools for students beyond temporary performance solutions.

Definition of Key Terms

To maintain clarity and consistency in this research study, it is essential to establish definitions for multiple central terms. The specialized vocabulary used in this study demands definition because they form the foundation for understanding both the project's focus and the examination of writing goals in relation to adolescent academic success. The research paper's definitions enable readers to interpret findings correctly because they highlight the specific application of these terms within this study. The terms are listed in alphabetical order for easy reference.

Academic Achievement: Student performance in reading, writing, and mathematics is measured through standardized tests and teacher evaluations or grades (Ladd, 2012).

Adolescents: The World Health Organization (2022) defines adolescents as individuals who are developing between childhood and adulthood between the ages of 10 to 19.

Cognitive Engagement: Students use mental effort and apply strategies to learning tasks based on their interest level alongside their motivation and how they value the activity (Fredricks, Blumenfeld, & Paris, 2004).

Exploratory Practice: Exploratory Practice is a form of practitioner research that focuses on integrating inquiry into everyday classroom practices to better understand and improve both teaching and learning. It emphasizes collaborative reflection between teachers and students to address puzzles, rather than problems, in the learning environment (Allwright, 2003).

Flipped Learning Context: A flipped learning context is an instructional approach where direct instruction is moved outside of class—typically through videos or online content—while in-class time is used for collaborative, interactive, and student-centered activities. This model fosters greater learner autonomy and supports the development of self-regulated learning skills (Çakiroglu & Öztürk, 2021)

Goal Setting: Goal setting involves creating specific measurable objectives within a set time to direct behavior and ensure concentrated effort toward reaching desired results (Locke & Latham, 2002).

Setting Theory: Locke & Latham (2002) proposed a psychological framework demonstrating how performance levels increase when specific challenging goals are combined with proper feedback.

Middle School: The United States educational system includes middle school which spans grades 6 to 8 for students who are usually between 11 and 14 years old (U.S. Department of Education, 2023).

Motivation: Goal-oriented behavior arises from internal motivation and external influences which guide and maintain educational actions according to

Ryan and Deci (2000).

Self-Efficacy: A person's self-belief in their capability to complete specific tasks or attain certain objectives impacts their motivation and academic outcomes according to Bandura (1997).

Self-Regulated Learning (SRL): Students actively manage their educational development by setting goals and monitoring their progress through self-assessment techniques as Zimmerman (2002) described.

Writing Goals: Students benefit from clearly defined writing objectives that direct their writing process through goals focused on structure, content development, revision efforts, and mechanical accuracy. Writing goals can originate from teachers or be created by students, according to Graham, Harris, and Chambers (2016).

Summary

Motivation is a fundamental component of academic achievement, particularly in writing tasks. Schweder et al. (2022) identified self-efficacy, along with goal setting and learning context, as key factors that influence student success in writing tasks. The application of SRL approaches, such as self-assessment and reflection, enhances student writing outcomes by fostering self-awareness and independent learning abilities (Chung et al., 2021). Research indicates that student academic progress is positively impacted by SRL practices, as metacognitive strategies are essential for sustained learning growth (Andrade & Du, 2007). According to Zimmerman (2000), when educators incorporate SRL methods into their teaching, students develop mastery-oriented behaviors that help them overcome performance-related challenges, thereby facilitating their academic advancement.

Strategy-based writing instruction improves student performance as cognitive techniques have been proven to enhance writing skills (Graham et al., 2023). Research findings show that motivation plays a crucial role in writing achievement through educational approaches that support self-driven and self-managed learning practices (Schunk & Swartz, 1993). Research shows that students improve their writing abilities through integrated skills instruction which specifically boosts vocabulary and grammar skills (Kitila et al., 2023). The research project examines how motivational and metacognitive factors can be incorporated into writing instruction to promote students' academic development.

This study examines how self-regulated learning and motivation affect student achievement through academic achievement and how motivational factors including self-efficacy and goal setting influence the adoption of self-regulated learning strategies within educational environments. The research investigates the role of motivational factors and self-regulated learning strategies in writing success and seeks to understand how these methods support student autonomy and development. In Chapter 2, there will be an extensive literature review examining motivation, self-efficacy, goal setting, and self-regulated learning strategies to understand their relationship with writing achievement

in adolescent students. Chapter 3 will outline the policy implications of the research, discussing how the findings can inform educational practice and decision-making.

Chapter 2: Review of Related Literature
Introduction

Today's adolescents must navigate through a more demanding academic world but frequently lack basic study skills that are essential for success. As schools demand higher levels of performance and productivity, many students do not possess essential skills in time management, goal-setting abilities, organizational methods, or self-regulation. The first chapter emphasized the importance of studying the effects of structured study skills on academic performance at adolescent schools. This study aims to explore how direct instruction in study skills enhances academic performance for young people while determining which approaches yield the best long-term educational results.

This chapter examines existing research and educational insights into study skills and their impact on the academic achievements of adolescents. The chapter integrates essential findings and theories with educational practices to demonstrate how study skills are essential in contemporary educational settings. Three principal areas form the structure of this review. The section titled Foundational Concepts of Study Skills examines the definition of study skills and tracks their developmental origins and evolution within adolescent education. Study Skills and Adolescent Development examine the special difficulties faced by teenagers alongside their developmental requirements while highlighting how these stages affect their study habit formation. Research presented in Analysis of Study Skills Impact on Academic Performance Results demonstrates that students with better study skills achieve significant academic progress. These sections form the basis to comprehend both the mechanisms and reasons behind the meaningful impact that study skills teaching has on adolescent students.

Foundational Concepts of Study Skills

Understanding the influence of study skills on adolescent academic success requires an initial exploration of study skills definitions and their educational evolution and importance. Study skills encompass specialized methods and approaches that enable students to achieve better learning results through time management and note-taking techniques alongside organization abilities and self-regulation skills along with test preparation methods. Targeted instruction can teach and enhance these study skills because they are not naturally developed abilities. Educational researchers now stress the need to directly teach these tools so students can achieve academic growth and meet demanding learning requirements.

This section contains three essential segments. The text begins by providing an established definition of study skills based on educational research

literature. The chapter investigates Cognitive Load Theory and Self-Regulated Learning Theory and other key academic and psychological principles that support formal study skills instruction. This section examines how K–12 education has either integrated or ignored the teaching of study skills throughout its history. The combined elements provide fundamental background information and conceptual clarity that prepare students for understanding adolescent development and how study skills affect academic performance.

Study Skills

Study skills include various methods and strategies which support students in achieving better learning outcomes and academic success. Students must master time management, note-taking, reading comprehension alongside test preparation and self-regulation techniques to succeed academically. Study skills are teachable methods that develop through instruction and practice instead of being natural talents. Explicit teaching of study skills leads to better academic results and higher motivation among students according to research findings (Centre for Teaching and Learning, 2024; Zepeda et al., 2015).

Recent years have shown growing recognition by schools about the importance of incorporating direct study skill instruction into academic programs. Middle and high schools today frequently incorporate specific interventions that combine goal setting with time management and self-assessment elements into their educational programs. Explicit instruction in self-assessment and planning strategies resulted in significant improvements in student self-efficacy and academic outcomes according to Chung, Chen, and Olson (2021). The integration of these methodologies into writing instructions revealed benefits that reached beyond literacy areas, which demonstrated the extensive effects of structured study skills instruction.

Research from both national and international sources demonstrates that study skills instruction proves successful for different student populations and across diverse educational settings. Graham et al. Through their 2023 meta-analysis of writing treatments for middle and high school students, determined that strategy-based instruction which incorporates goal setting and reflection yields the best academic results. The Pathway to Academic Success Project (2021) demonstrates that employing structured cognitive-based methods like activating prior knowledge and questioning techniques leads to better literacy outcomes for English learners. Schools implement study skills training while customizing this training to meet diverse student needs through classroom interventions and teacher professional development.

Theoretical Foundations Supporting Study Skills in Education

The principles behind study skills originate from cognitive and educational psychology research. According to Cognitive Load Theory, learners have limited processing ability which effective study methods overcome by structuring information into manageable parts (Centre for Teaching and Learning, 2024). Self-Regulated Learning Theory shows that metacognition and motivational behaviors together with active monitoring and evaluation of learning

processes help students achieve superior academic results (Opdenakker, 2022; Zepeda et al., 2015). Research theories provide evidence for incorporating study skill training within educational systems to improve student learning outcomes.

The Self-Efficacy Theory developed by Bandura in 1997 provides another vital framework for comprehending how study methods affect student academic performance. According to Bandura, students who believe they can succeed will approach their learning tasks differently and show greater persistence in overcoming academic challenges. Explicit instruction in study strategies combined with successful implementation leads to improved self-efficacy and consequently boosts motivation and resilience among students (Schunk & DiBenedetto, 2020). The approach described matches Zimmerman's model of self-regulated learning because it outlines a repetitive cycle that includes forethought, performance execution, and self-reflection to reach educational targets (Zimmerman, 2002). These theories collectively demonstrate the need to provide adolescents with cognitive skills and psychological assistance so they can take control of their educational journey and excel in school settings.

History of Study Skills in Adolescent Education

Over time, educational practices have shown an evolving emphasis on skills development. Curricular study skills during the early 20th century remained implicit while students were expected to develop these abilities on their own. Research conducted during the second half of the century demonstrated that explicit teaching of study strategies was necessary to support learners with diverse needs (ERIC, 1980). The change led to the creation of organized programs and interventions which focused on teaching students effective learning techniques. New research reinforces the vital role of study skills instruction for academic success through findings by Hedin and Kann (2016) and Cazan (2020). Understanding basic study skills requires familiarity with their definitions and theoretical foundations, and historical evolution. The foundational elements discussed establish the groundwork for examining the effects of study skills on students' academic success in later parts of this literature review.

Study Skills and Adolescent Development

During adolescence students undergo critical cognitive, emotional, and social development which impacts their academic engagement and study behavior patterns. Scientific studies demonstrate that brain development throughout adolescence improves executive functions like working memory and planning as well as self-control which play essential roles in achieving academic success (Crone & Dahl, 2012; Luna, Padmanabhan, & O'Hearn, 2010). Students face opportunities and challenges when they try to establish and sustain study routines in a period characterized by quick neurological and emotional development. When creating academic interventions for adolescents' educators need to integrate knowledge about developmental factors (Steinberg & Morris, 2001).

This section investigates how both neurological changes in the ado-

lescent brain and emotional development influence students' development of study habits. The section examines self-regulation along with goal setting and time management as fundamental approaches to achieving academic success. The article ends by examining typical obstacles young learners encounter when trying to build effective study routines including inadequate teaching assistance and the interference of digital technologies. These elements together lay the groundwork for understanding how adolescent development relates to the learning of effective study techniques.

Adolescent Development and Study Habits

The adolescent stage represents a crucial developmental window for cognitive, emotional, and social growth which impacts how study skills are learned and applied. The adolescent stage brings swift transformations in brain structure and function which affect executive function areas including planning abilities as well as attention and self-regulation control (Crone & Dahl, 2012; Luna, Padmanabhan, & O'Hearn, 2010). Adolescents' brain development improves their ability to tackle complex learning activities while simultaneously making it difficult to develop stable study routines. To create successful study skills interventions that meet adolescents' specific requirements, we must understand their developmental trajectories.

Adolescents' study habits develop significantly through social and emotional influences. The progress of students in establishing productive study routines depends on peer relationships and parental involvement along with their emotional health (Steinberg & Morris, 2001; Wentzel, 1998). Research shows that students with elevated levels of stress and poor self-esteem often struggle to stay focused and motivated which leads to negative impacts on their study routines and educational accomplishments (Compas et al., 2001; Hampson et al. 2016). Study programs that integrate social-emotional learning components tend to better address students' wide-ranging developmental challenges.

Self-Regulation, Time Management, and Goal setting in Study Skills

The progression of self-regulated learning becomes increasingly important during adolescence because students start to assume greater control over their educational activities. SRL incorporates the practices of goal setting and self-reflection along with self-monitoring, which represent skills that adolescents continue to develop (Zimmerman 2002; Panadero 2017). Studies show adolescents who have developed strong SRL competencies achieve higher academic success while displaying increased motivation and persistence according to Dent & Koenka (2016) and De la Fuente-Arias (2017). Differences in SRL development among adolescents highlight the importance of direct instruction and support structures that accommodate individual learning variations.

The educational context plays a critical role in shaping adolescents' study skill development. SRL development and improved study practices occur in educational settings that enhance student autonomy while motivating meta-cognitive thinking along with structured feedback (Järvelä & Hadwin, 2013;

Murray et al., 2015). Students struggle to acquire self-management skills in learning environments that are either too structured or lack enough structure, which prevents them from learning independently (Pintrich, 2000; Zimmerman, 2013). Study skills instruction reaches its highest effectiveness when integrated into learning environments that stimulate reflection and ownership while supporting student growth.

Barriers to Building Strong Study Habits in Adolescents

The development of strong study habits in adolescents is hindered by the various obstacles they encounter. Students face a significant challenge from the growing number of digital distractions throughout their daily lives. Digital distractions from smartphones, together with social media platforms as well as streaming services and video games via focus for students which frequently disrupt their ability to concentrate and complete academic tasks (Rosen, Carrier, & Cheever, 2013). Student study patterns become inconsistent because these distractions limit deep learning time. The practice of alternating between educational tasks and digital distractions damages students' ability to concentrate and hinders their academic success (Junco, 2012; Sana, Weston, & Cepeda, 2013). Many adolescents struggle to maintain effective study discipline because they lack direct instruction and guidance to manage their digital engagement.

Many school systems fail to provide students with formal lessons on how to study effectively. Students during adolescence frequently face the expectation to discover their own study methods, but research shows they need formal instruction and practice to develop effective study skills (Gettinger & Seibert, 2002). The absence of organized time management and organizational training among students causes them to adopt ineffective study methods which result in both academic failure and student frustration (Reed, Evely & Glass, 2021). Schools lacking personalized or differentiated support systems cannot effectively address the varying developmental needs of students who need help to acquire self-regulation and independent workload management skills. The lack of proper instruction creates larger achievement gaps between students, which shows the need to include study skills training in standard curricula.

The period of adolescence offers a critical chance to establish core academic habits while introducing unique challenges that must be navigated. When study skills instruction is developmentally appropriate and socially responsive while remaining instructionally embedded, it enables students to connect their developing cognitive abilities with academic requirements. This upcoming section examines the direct impact that study skills instruction has on academic achievements among adolescents.

Analysis of Study Skills Impact on Academic Performance Results

The importance of strong study skills has been well-documented by educators and researchers in relation to student academic success. The academic demands for middle and high school students increase as they must learn to manage their time, maintain organization, and assume control of their

education, which requires skills that students do not inherently possess. Students adopting strong study practices like time management and goal setting alongside test preparation have demonstrated higher academic performance while remaining actively engaged in their studies (Hattie & Donoghue, 2016; Robbins et al., 2004). These skills assist classroom learning while also developing student confidence and motivation, which aid in achieving sustained academic success.

This section examines the essential role study skills play in determining students' academic success. Students who develop good study habits perform better in middle school and high school. The section then reviews programs and teaching strategies which evidence shows help students develop better study habits. The text examines how these study skills provide ongoing advantages for students who are moving into college or beginning their professional careers. Evidence in this section demonstrates that study skills instruction goes beyond helpfulness to become crucial for students' academic development and self-assurance over time.

Study Skills and Academic Performance in Adolescent Education

Study skills interventions have demonstrated academic benefits according to multiple meta-analyses. Dent and Koenka's (2016) comprehensive review revealed that children through adolescents who used self-regulated learning strategies demonstrated significantly better academic outcomes. Panadero's (2017) analysis of six primary SRL models showed better academic performance among students who participated in goal setting, self-assessment practices and reflection compared to their peers who did not. This research supports earlier studies which demonstrated cognitive advantages through metacognitive learning techniques according to Zimmerman (2002). Analysis combining multiple studies supports the integration of SRL and study habits into regular teaching practices.

Large-scale meta-analyses and experimental studies centered on writing and goal-setting approaches provide additional support for the academic benefits of study skills. For instance, Graham et al. (2023) meta-analysis of more than 50,000 Grades 6–12 students showed that writing strategy instruction which included planning, revising, and goal-setting exercises led to substantial improvements in writing (effect size = 0.47) and reading performance (effect size = 0.22). The study by Chung et al. (2021) revealed that middle and high school students experienced better self-efficacy and writing revision results through self-assessment together with goal setting and reflection exercises. The research confirms that academic success results from general study methods as well as from teaching students' explicit techniques for planning and controlling their learning activities which highlights the importance of metacognitive activities for educational achievement.

Training Programs and Instructional Approaches for Study Skills

Teaching students how to set goals and reflect on their learning can make a real difference in how they approach schoolwork. Philippakos (2020)

highlights how using goal setting and reflection through the Self-Regulated Strategy Development (SRSD) model helps students become more confident and take charge of their own learning. When students aim to improve rather than just outperform others, they develop stronger habits and feel more capable. Aitken and Halkowski (2024) also showed that giving students the chance to create their own writing goals led to real growth in their writing performance. These kinds of programs show that when students are taught how to think about their learning and set goals, they build study habits that last.

Programs which combine teaching study strategies with substantial teacher support deliver excellent outcomes. The Pathway to Academic Success Project taught English learners writing strategies such as goal setting and questioning during regular class time to help them improve. The program gave teachers continuous training and coaching, enabling them to integrate these skills into their daily lessons. Students received benefits from this support because it enhanced their writing abilities and transformed their approach to learning. Such programs demonstrate the effectiveness of incorporating study skills into classroom activities that appear natural and supported when teachers receive necessary tools for student success.

Long-Term Impact of Study Skills Beyond High School

Learning effective study skills during high school provides students with more than academic success; these skills prepare them for college and future endeavors. Studies demonstrate that students who engage in self-reflection along with goal setting and planning develop increased confidence which results in improved academic performance. The study by Chung, Chen, and Olson (2021) showed that students who engaged in metacognitive strategies such as planning and self-assessment experienced improvements in their writing skills and confidence in their capabilities. A keen sense of self-efficacy serves as an essential asset in post-secondary education because students must navigate their learning with minimal support.

Study skills support students by enabling them to maintain their dedication to goals which benefits their motivation, especially when they learn independently. The study by Li, Johnsen, and Canelas (2021) found that students with defined educational objectives experienced better course attendance and superior outcomes on prominent online learning platforms. Entering college and job training programs, students improve their success by learning how to set goals and track their progress. According to Zumbrunn et al. (2020), students are confident about their writing abilities to perform better academically and execute complex tasks more efficiently, which provides advantages beyond high school. Study skills offer benefits that extend into students' self-perception as learners beyond academic achievements. According to Blackmon (2023), student success leads to motivation and identity factors. Understanding their personal motivations and learning preferences enables students to maintain engagement and control their educational progress. By connecting study skills with personal development programs, students acquire not only academ-

ic tools but also enduring life skills that benefit them throughout their lives.

Criticism of the Literature

The research on study skills instruction establishes its effectiveness, but it includes considerations that need attention. Self-reported data collection remains a recurring method used to measure construction such as motivation and self-efficacy along with strategy use across numerous studies. The insights into student perceptions provide valuable information but fail to show the full picture on academic behaviors or outcomes according to Zumbrunn et al. (2020) and Wilson et al. (2023). Future research studies should integrate self-report measures with performance-based assessments to achieve a more complete picture of how study skills produce tangible academic improvements. Research encounters difficulties due to the narrow range of student groups examined.

Research literature examines urban areas and high-performing secondary schools but does not include rural students and those with learning challenges or language barriers. The Pathway to Academic Success Project, which serves EL students, remains an uncommon focus area in extensive research literature (WWC, 2020). Numerous intervention studies last only a brief time or exist as pilot programs which complicate the assessment of study skill instruction impacts on future college achievement or job preparedness. The absence of longitudinal research represents a major gap in academic analysis.

Summary

The first strand created a basic understanding of study skills, starting with essential definitions and theoretical concepts. Educational studies show that Cognitive Load Theory along with Self-Regulated Learning and Bandura's Self-Efficacy Theory strongly support the need to teach study skills in schools. Historical analysis showed that structured learning strategies have gained priority in developing adolescent educational systems.

The second research strand examined how adolescents' development across cognitive, emotional, and social dimensions impacts their learning and the application of effective study practices. Mature students develop stronger self-regulation skills, time management, and goal-setting practices. Even though students develop better learning skills as they mature, these improvements also bring typical problems from digital distractions and insufficient formal study skill instruction. The results demonstrate that we need to teach study skills to adolescents using methods that match their developmental stage while addressing their current needs.

The third research strand examined how study skills affect academic performance. Academic performance improves students who receive explicit instruction in study techniques according to consistent research findings. According to this strand of instructional strategies based on goal setting, metacognition and self-assessment benefit students during secondary education while also improving their readiness for post-high school life. Long-term skill development programs create independent learners who achieve greater suc-

cess in both higher education and their future careers.

The strands show that study skills instruction has both theoretical and research support while essential for adolescent development and educational achievement. This chapter recognizes existing research deficiencies concerning the uniform application of study skills and longitudinal outcomes when applied to various student groups.

Chapter 3: Implications
Introduction

This chapter provides the implications for the research design, which was used to answer the three questions set out in the introduction:

Does self-assessment enhance the writing performance of adolescents?

Does the application of goal setting and planning processes enhance the writing abilities of adolescents?

Do adolescents show different writing outcomes when they practice reflection before and after the revision process?

Writing is an important academic skill; if students are to be equipped with metacognitive tools to enhance their academic performance and longer-term persistence in education, it is important to understand which strategies and interventions have a meaningful impact. It is a complicated task, but one that is of value to students, families, and educators. From an adolescent perspective, having confidence and motivation to participate in academic writing activities in meaningful ways can be connected to either low self-efficacy or a deficit of structure and support in one's environment. The outcomes from a focused intervention using multiple tools to promote study skill can offer insight into the perceived or actual value of specific practices. It may also provide a set of variables to consider and guide professional decision-making about instruction, professional learning and curriculum design related to student learning and ongoing learning capacity.

Conclusions

The results of this literature review demonstrate that self-assessment, goal setting, and reflections are all impactful strategies for student writing outcomes. Students who self-assess tend to perform better because they can more easily identify strengths and areas of improvement in their own writing, which allows them to make more targeted revisions, resulting in stronger final drafts (Chung, Chen, & Olson, 2021). Additionally, goal setting and planning can also positively impact adolescent writing performance, as these techniques give students a framework for approaching their work and a sense of autonomy over their learning. Goal setting and progress monitoring can be especially effective for improving writing quality, task persistence, and motivation when students set their own goals and track their progress over time (Aitken & Halkowski,

2024; Philippakos, 2020).

      Pre and post revision reflections have also been shown to have a positive influence on student writing performance, with students who practice these activities tending to approach their work with greater intentionality and subsequently demonstrating stronger metacognition and self-efficacy, resulting in clearer and more logical arguments as well as better organization (Chung et al., 2021). This evidence supports previous research and reinforces the idea that improved writing does not come about by accident. Instead, students must be explicitly taught how to learn and to become more metacognitive about their writing process, after which they are more likely to develop effective writing habits that they can build on for future success.

      In summary, the evidence from this review supports the claim that writing can be improved with specific, teachable strategies grounded in self-regulated learning theory. This study, consistent with other sources, found that adolescents, when given the appropriate tools and support, can develop confidence and competence to meet their present and future writing needs.

Practice Implications

      These results provide useful implications for classroom teachers looking to leverage Self-Regulated Learning (SRL) to enhance adolescent writing. The first policy recommendation at the classroom level is that writing teachers integrate guided self-assessment into writing instruction. Teachers can adopt a system of using checklists or rubrics and having students interact with them before and after a writing task or assignment. The checklist or rubric will detail the expectations or criteria for the task and help the students identify areas of the task that need improvement. This practice can be seamlessly built into regular writing instruction to help students reflect on their learning and take an active role in the process. As Chung et al. (2021) have shown in their research, self-assessment can enhance both writing outcomes and student self-efficacy.

      Formalizing self-assessment practices can help to make self-assessment a regular part of classroom practice. Another classroom-level policy worth implementing is the regular use of student-directed goal setting. Students should be coached in the creation of individualized, measurable goals for targeted elements of writing (organization, argument development, grammatical accuracy, etc.) that are tracked across more than one draft and can help drive persistent effort and reflection. Students who set their own writing goals were shown by Aitken & Halkowski (2024) to meaningfully improve functional elements of their writing. Goal setting when implemented as a regular required instructional practice can build student motivation, accountability, and long-term writing growth.

      Finally, classrooms should implement a policy of reflective writing before and after the revision process. Instructors may easily integrate one or

two reflection prompts or a revision journal into a writing assignment and ask students to explain the changes they made in the draft and the reasons those changes were made. The benefits of such a reflection would further aid in making the writing learning experience more meaningful and support the development of self-regulated writing behaviors. When students reflect on their writing, they can think of writing as a process rather than as a discrete activity. By providing a structured time for reflection in writing instruction, students can become more strategic, more goal-directed, and intentional in their writing, leading to better grades and a more confident writer. (Zimmerman, 2002)

Policy Implications

The paper also provides several directions for school and district policy. First, it is important for formal institutional policies to mandate and value the teaching of self-assessment, goal setting, and reflection as study skills that are taught as part of writing assignments and instruction in schools. There is a strong focus on the product of writing and final assessments but far less on process or evidence-based methods that could aid student writing in classrooms. Policymakers could look to include process-based, strategy-supported writing in state content standards and district pacing guides so that teachers can be held accountable to using instructional practices supported by research, and more likely to meet the needs of their students.

Teacher preparation and professional development policies can also support instructional practices that develop self-regulated learning skills and study habits. Most teachers are underprepared to implement strategies such as self-assessment or targeted goal setting within their classrooms. Mandating professional development in these practices, particularly for writing instruction, would help prepare teachers to develop these skills in their students. Examples of research-backed programs, such as the Pathway to Academic Success Project (2021), which coaches' teachers in strategy-based writing instruction, should be emulated and incentivized at scale by districts. Incentivizing and implementing policies that support teacher preparation in these areas would lead to sustainable long-term impacts for students, especially for students that have been historically underserved in schools.

School assessment and grading policies can also include formative assessments, reflection, and student input. While it is hard to make policy changes around high stakes testing, providing frequent opportunities for students to evaluate their learning and set their own goals on their path to a final summative assessment is also likely to be motivating for students and promote learning. Policies that support more flexible grading schemes and feedback systems, such as portfolios, multi-draft writing assignments, and revised feedback, have also been shown to improve academic skills and confidence in writing in adolescents.

Directions for Future Study

Although this review has shown some ways that self-assessment, goal setting, and reflection can positively affect adolescent performance, there are also some areas for further study. Most of the studies that were referenced were from one-off case studies, or small samples of a certain population of students. The efficacy of these strategies in more broadly representative classrooms with a wide range of students in various socioeconomic or cultural situations needs to be better understood. These studies should be conducted in various kinds of school settings, such as those with lower access to instructional supports and those with large populations of English learners. It would also be valuable to study the longitudinal growth of these skills to better understand the impact of intervention or absence of these skills on self-efficacy and performance as students advance into their postsecondary academic careers and careers in general.

Lastly, it is important to consider how technological interventions impact a learner's ability to self-regulate. In the increasing prevalence of instructional technologies in the classroom and with new technological tools being designed for educational purposes (apps, chatbots, LMS, etc.) it would be interesting to see if these tools are genuinely facilitating learners to be more reflective, set realistic goals, and make improvements to their writing or if they are simply creating more problems. It would also be interesting to collect data from learners to better understand how they feel about these strategies. This information can help both teachers and researchers to be more effective and develop a clearer understanding of how self-regulation factors impact academic outcomes. Qualitative data, along with quantitative information, would paint a clearer picture of how study skills influence academic achievement.

Summary

The primary focus of this chapter was to discuss and interpret the findings from the research, and how the data answers the three research questions. The three research questions addressed whether specific study skills, self-assessment, goal setting, and reflection improved adolescents' writing development. The data from this series of studies show that when these skills are intentionally taught and practiced by students, positive and observable effects can be seen in terms of performance, self-efficacy, and engagement with writing. In all the studies, the adolescents who implemented these strategies were able to make more substantial revisions, create more organization, and take more ownership in their learning.

In addition to the information covered in the chapter, other important applications of this information to the real world of practice and policy were considered. For example, classroom interventions that operationalize SRL, like student-led goal setting or revision reflection, could be used to enhance outcomes for a variety of student populations. Policy implications of this research

may include an increased investment from schools and districts in professional development or curriculum design that intentionally operationalizes these strategies into day-to-day instruction. There is also a strong need for more equitable implementation of these practices in public and private schools.

Overall, the chapter provides evidence that can help teachers support their students. The ways in which metacognitive skills and self-regulated learning can be fostered during secondary school writing instruction can have long-lasting effects on student success. Although there is a need for more research on certain student populations and more long-term tracking of students' use of their skills, there is a convincing argument for including study skills instruction in all writing programs.

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School Attendance on the Spectrum: An Exploration of the Impact of Autism Spectrum Disorder on Chronic Absenteeism in High School Students

Kayla Marie Purcell

Abstract

Students with Autism are at a higher risk of experiencing chronic absenteeism than their peers, yet the link between these two factors remains unexplored. With diagnoses of Autism Spectrum Disorder on the rise in the United States and chronic absenteeism remaining a nationwide problem, exploring the connection between Autism and chronic absenteeism to target groups that are the most at-risk for chronic absenteeism is crucial. Examining the impact of Autism Spectrum Disorder on chronic absenteeism will support school districts in their continued efforts to improve attendance rates at the high school level. This project concluded that chronic absenteeism impacts the academic achievement of all students, with chronic absenteeism contributing to lower graduation rates, grades, and GPA. Academic achievement could be measured in the same ways for both students with and without Autism; the difference being the level of support needed for students with Autism. To better support students with Autism, general education teachers can receive more classes on supporting students with disabilities, offer more engaging lessons in the classroom to support student interests, and create sensory-aware classrooms by reducing lighting. Overall, this project supported the idea that a more universal training program for educators or parents, and individualized reviews of the risk factors that influence students to be absent from school, are necessary to provide the proper academic support for all students and students with Autism experiencing chronic absenteeism.

Chapter 1: Introduction to the Project
Background

School attendance was once not monitored, regulated, or required in the same way it is in 2025. Prior to 1918, schools did not have compulsory school attendance laws (Goldstein, 2012). According to Burr et al. (2023), truancy dates back to the 19th century, when states began to implement compulsory attendance laws. Reporting school attendance later became mandatory under the 2001 No Child Left Behind (NCLB) Act due to declining test scores, which the legislation believed to be a result of truancy (Burr et al., 2023). Although truancy has a different definition for every state, "truancy typically refers to students who do not attend school for a specific number of days or a specific percentage of the academic year without providing documentation to account for their absence (unexcused absences)" (Burr et al.,

2023, p.2). Truancy and chronic absenteeism were largely used interchangeably until 2015 with the introduction of the Every Student Succeeds Act (ESSA), which replaced NCLB and was the first time that chronic absenteeism was represented in educational laws by the federal government (Burr et al., 2023). Additionally, federal governments ended the mandate that required schools to report truancy data, so their focus could shift to chronic absenteeism to meet the ESSA state accountability indicators (Burr et al., 2023). As of 2025, only 22 states and the District of Columbia require truancy data (Weathers & Loeb, 2022). This movement towards chronic absenteeism recognizes the idea that students miss school in different contexts than just unexcused absences, and allows community efforts to shift towards encouraging attendance rather than punishing students for nonattendance.

Much like the legislation surrounding school attendance has evolved and changed over time, Autism did not initially have the same definition or diagnostic criteria it does in 2025. German psychiatrist Eugene Bleuler first gave it the name Autism to describe a symptom of severe schizophrenia (Evans, 2013). This term comes from the Greek root word autos, meaning self, and ism, meaning a state of being. Therefore, Autism means a state of self. Bleuler (1911/1950) described Autism as a detachment from reality, a retreat into one's inner world, and a state of intense self-focus. This was the case until the 1940s, when Austrian-American physician Leo Kanner (1943) found in a study that eight boys and three girls displayed a preference for solitude from birth onward, had consistent interests, performed repetitive and restrictive behaviours, displayed a lack of imagination, and suffered from language difficulties. It was these characteristics that helped define Autism in the 2013 edition of the Diagnostic and Statistical Manual (DSM) of Mental Disorders.

Kanner (1943) provided the first known description of Autistic behaviors being differentiated from the behaviors of childhood schizophrenia, as Bleuler (1911/1950) had originally professed it to be. Around that same time, Hans Asperger noticed a genetic link between childhood Autism and the eccentric personality traits of their parents (Blake et al., 2013). He was the first to posit the idea of high-functioning Autism, and therefore, Asperger's Syndrome was named after him in the 1994 edition of the DSM of Mental Disorders, and it became diagnosable separately from Autism for the first time. Finally, with the release of the DSM–5 in 2013, Asperger's Syndrome was retired in favor of the broader Autism Spectrum Disorder (ASD), which is still used in 2025. At that time, the diagnosis of ASD was split into three different levels: Level 1, Level 2, and Level 3. Both Asperger's Syndrome and high-functioning Autism were reworked and are most closely associated with individuals diagnosed with Level 1 Autism. Level 2 Autism is defined as having moderate support needs, while Level 3 requires the highest amount of support (APA, 2013). Diagnostic criteria remain the same for each level, with the only variation being the amount of support needed. With the broadening of this diagnostic criteria, the rate of Autism diagnoses rose from 1:150 children in

2000 to 1:68 children in 2013, increasing to its current rate of 1:31 children in 2022 (CDC, 2025).

In the 2022-2023 school year of students from ages 3 to 21 served under the Individuals with Disabilities Education Act (IDEA), 13% of the 7.5 million students served under IDEA are made up of students with ASD (NCES, 2025). Students on the Autism spectrum are more likely to experience challenges such as sensory overload, bullying or isolation, executive dysfunction, mental health comorbidities such as anxiety or depression (Bougeard et al., 2021), or transition challenges, all of which are factors, when in combination, can contribute to Autistic burnout and the lack of desire to attend school because of the way it affects them (Miller et al., 2021 & Raymaker, 2022 & Price, 2022). Even with a strong support system in place, including Individualized Education Plans (IEPs) and 504 plans, there is still a need to investigate the impact of ASD on chronic absenteeism.

Statement of the Problem

Since the COVID-19 Pandemic, states have been working harder to address the growing nationwide attendance crisis (Burr et al., 2023). As such, chronic absenteeism is a prominent, nationwide problem that affects all aspects of education, including the rate of graduation. Chronic absenteeism is one of the many factors that contribute to lower graduation rates in the United States (Jensen & King, 2019). Students who experience chronic absenteeism are far more likely to fall behind their peers (Allensworth & Easton, 2007). Another student group that consistently falls behind their peers is students with disabilities. According to the National Center for Education Statistics (2024), 74% of students with disabilities, which includes students with (a) a designated specific learning disability, (b) speech or language impairment, (c) other health impairment, (d) Autism, (e) developmental delay, (f) intellectual disability, (g) emotional disturbance, (h) multiple disabilities, or (i) a hearing impairment, graduated with a high school diploma, compared to the general high school graduation rate of 87%. Additionally, Adams (2021) stated that students with Autism are more likely to miss school compared to their peers. It becomes evident that students with disabilities contribute a significant amount to the issue of chronic absenteeism in the United States, and very little research has been done linking chronic absenteeism and ASD (Totsika et al., 2020), despite the research stating that students with Autism are more likely to miss school compared to their peers.

Purpose of the Project

The purpose of this project is to examine the impact of ASD on chronic absenteeism in high school students. Currently, the research linking chronic absenteeism and ASD is weak (Totsika et al., 2020), and this project aims to create a stronger link between the two in order to discover a solution to better support the academic motivation for school attendance in Autistic high school students across all levels of the spectrum. By examining the impact of ASD on chronic absenteeism, this project will support school districts in their

continued efforts to improve attendance rates at the high school level. The research questions that will guide this project are the following:

1. What hinders high school students with Autism from being present at school regularly?

2. Does poor attendance rates of high school students with ASD impact student achievement?

3. What motivational strategies can improve the academic motivation for high school students with ASD?

Theoretical Framework of the Project

Martin V. Covington was a California native and Professor Emeritus at University of California, Berkeley, known for his research on student motivation, intrinsic learning, and achievement in the classroom until his death in 2018. Covington's Self-Worth Theory suggested that the search for self-acceptance is the utmost human priority (Weibell, 2011). In other words, "achievement is best understood in terms of maintaining a positive self-image of one's ability, particularly when risking competitive failure" (Covington, 1998, p. 78). According to Snowman et al. (2009), self-concept, self-esteem and appearance are of the utmost priority in the adolescent years of 14 to 18 (Snowman, 2009). Both sources affirm the idea that if a student's needs regarding self-worth are not met, they are not likely to perform well academically. According to Covington (1984), if students believe they will be perceived as a failure, they will do one of two self-serving things to avoid this. They will either make excuses or assure success. Excuses may include the following:

The setting of unrealistically high goals and procrastination—both of which allow the student to "fail with honor" … not studying; responding vaguely; not trying; avoiding work that is not absolutely required; doing as little as possible; remaining silent; outright refusal; false effort; giving the outward appearances of understanding, while not really understanding; a pensive, quizzical look to give the impression that one is too busy thinking to be interrupted; asking questions whose answers are already known; copying from a neighbors' paper, and perhaps adding a unique touch, and the public admission of some minor personal weakness or handicap to avoid disclosing intellectual inadequacy, also known as, "the academic wooden leg" (Covington, 1998, pp. 12, 16, 84, 85, 89) Overall, excuses are a way for a student to protect their self-worth, but reliance on these strategies in the long term are not sustainable.

On the other hand, a student who assures success may instead set their standards so low that the likelihood of failure is also low (Covington, 1984). Many bright students who use this strategy typically do succeed through hard work; however, as this strategy is still a defense mechanism, many students will remain doubtful of their abilities and accomplishments throughout their lifetime, creating insecure adults who Covington (1984) deems as overstrivers.

Covington (1984) also recognized that hard work is a key component of to success; however, he described it as "a double-edged sword" (Covington,

1984, p. 10). Covington was aware that effort in school is necessary to avoid punishment and guilt, but trying hard puts the student at risk due to the fear of failure, contributing to low self-esteem, which in turn can cause humiliation and shame (Covington, 1984). In other words, there is a gap created when a student tries to pass but is met with failure, leading to low-achieving students with a lack of motivation. Students who feel humiliation and shame over their performance in school may not feel motivated to attend school, which leads to bouts of chronic absenteeism by means of school refusal.

The development of anxiety in high-masking adolescent individuals with Autism is prominent regardless of level, and oftentimes that leads to a lack of self-esteem or performance in activities such as school (Bellini, 2006). Anxiety over performance and a perceived fear of failure are key factors in Covington's Self-Worth Theory, and the lack thereof may result in chronic absenteeism as a defense mechanism. Price (2022) stated that a diagnosis of mental illness or hidden disabilities such as Autism may lead to shame; furthermore, individuals with Autism may experience a higher amount of shame than their peers, resulting in a lack of self-confidence and self-acceptance, and therefore a lack of performance. Price (2022) also noted in an interview that school refusal is a common experience among Autistic adolescents:

> School bells stressed [me] out and everything was moving too quickly… [I] began to burn out, so [my] cognitive and social functioning declined even more. Now [I] couldn't even push [myself] through the school day… So, [I] started begging [my] mom to let [me] skip school… Eventually, I hit the limit of how many sick days I could have without getting in trouble. But for as long as I could, I got "stomachaches" and stayed home, which really kept me sane… Faking sickness was an essential part of [my] mask. It could get [me] out of the overstimulating classroom and provide [me] some much-needed rest (88).
>
> This interview about school refusal demonstrates that due to difficulties in school, some students with Autism would rather lie about an illness than attend school, which shows just how flawed the school system is in accommodating for students with Autism.

To summarize, students with Autism are more likely to experience burnout due to the stress of school, therefore feeling like they should not try due to the feeling of failure and hopelessness (McCauley et al., 2017). These factors culminate in the idea that chronic absenteeism in individuals with Autism is a direct reflection of Covington's Self-Worth Theory.

Definition of Key Terms

The key terms that will be used throughout this project are as follows:

Academic Achievement: According to the American Psychological Association (APA), academic achievement is defined as "any identifiable success in the areas of scholarship or disciplined study" (APA, 2018, Academic Achievement section).

ASD: The National Institute of Mental Health (NIMH) defines ASD

as "a neurological and developmental disorder that affects how people interact with others, communicate, learn, and behave." The term encompasses all three diagnosable levels of Autism. (NIMH, 2024, What is Autism Spectrum Disorder section)

Autistic Burnout: Autistic burnout, as defined by the National Autistic Society, is "a syndrome conceptualized as resulting from chronic life stress and a mismatch of expectations and abilities without adequate supports. It is characterized by pervasive, long-term (typically 3+ months) exhaustion, loss of function, and reduced tolerance to stimulus" (Raymaker, 2022, Definition of Autistic Burnout section).

Chronic Absenteeism: Chronic absenteeism measures the amount of all absences in a school year: excused, unexcused and suspensions (Attendance Works, 2018).

Comorbid Disorder(s): As defined by Valderas et al. (2009), comorbid disorders means "more than [one] distinct condition in an individual" (para. 5).

Extrinsic Motivation: The APA defines extrinsic motivation as "an external incentive to engage in a specific activity, especially motivation arising from the expectation of punishment or reward (e.g., completing a disliked chore in exchange for payment)" (APA, 2018, Extrinsic Motivation section).

Individualized Education Program (IEP): An IEP is a highly personalized legal document outlining the course of a child's special education program in public schools (United States Department of Education, 2000).

Intrinsic Motivation: Intrinsic motivation is the natural human curiosity and drive to explore, fostering playful engagement (Ryan and Desi, 2000).

Level 1 Autism: Mild symptoms of Autism and low support needs in one or more areas of diagnostic criteria, as defined by the American Psychological Association (2013).

Level 2 Autism: Moderate symptoms of Autism, with higher support needs than level 1 Autism in one or more areas of diagnostic criteria, as defined by the American Psychological Association (2013).

Level 3 Autism: Severe presentation of the symptoms of Autism, with extreme support needs in one or more areas of diagnostic criteria, as defined by the American Psychological Association (2013).

Masking: Masking is a term used by the Autistic community to describe hiding aspects of oneself to appear normal and fit in through conscious or unconscious means (Miller er al., 2021).

Truancy: Truancy refers to the number of unexcused absences a student has, often resulting in punitive consequences (Attendance Works, 2018).

504 Plan: A 504 Plan is a written document that helps schools provide support for students with disabilities to learn in a regular classroom (Schultz, 2022).

Summary

In summary, this project explores the relationship between ASD and chronic absenteeism in high-school-age students. Although school attendance

policies have evolved over time, the focus of cutting chronic absenteeism rates for all students remains a priority, while the link between ASD and chronic absenteeism has yet to be fully explored. Students on the Autism spectrum frequently experience challenges such as sensory sensitivities, anxiety, executive dysfunction, and social difficulties. These factors can lead to Autistic burnout and school refusal, resulting in chronic absenteeism despite support systems like IEPs and 504 plans. This absenteeism has significant implications for academic achievement and graduation outcomes. This project utilizes Covington's Self-Worth Theory (1976) to outline the importance of self-worth in high-school age students on the Autism spectrum and its effect on their motivation to attend school, aiming to link chronic absenteeism with school refusal in students with Autism. Covington (1984) posited that the fear of failure is central to this theory, especially when effort is tied to identity. Based on Covington's (1984) research, refusing to attend school is a defense mechanism to prevent the fear of failure. A student might ask the question, If trying leads to failure, then why try? and this becomes the default mentality for many students, especially for students on the spectrum who experience the fear of failure due to comorbid disorders, such as Anxiety and ADHD (Khan et al., 2024). This project will explore solutions for chronic absenteeism in this population and beyond.

In Chapters 2 and 3, the research will explore these questions: Does poor attendance rates of high school students with Autism Spectrum Disorder impact student achievement? What hinders high school students with Autism from being present at school regularly? What motivational strategies can improve the academic motivation for high school students with ASD? First, literature will be investigated to examine the current support options available for students with ASD. Next, the project will create a link between poor attendance and ASD and investigate underachievement in school. Finally, the literature will be synthesized to stress the importance of motivating Students with Autism to attend school.

Chapter 2: Review of Related Literature
Introduction

School attendance was not subject to regulations prior to the 20th century (Goldstein, 2012; Burr et al., 2023). When the No Child Left Behind (NCLB) Act was passed in 2001 and later replaced by the Every Student Succeeds Act (ESSA) in 2015, school attendance reporting became mandatory (Burr et al., 2023). Schools recognized that punishing students for their truancy and nonattendance was not an effective or comprehensive way of measuring absence. With the introduction of ESSA came the prevalence of the concept of chronic absenteeism, because students may miss school for a variety of reasons. By 2022, 22 states and the District of Columbia required the collection of data on truancy, with most states favoring data on chronic absenteeism (Weathers & Loeb, 2022). Despite preventative measures and improving rates

of absenteeism following peak rates in 2020 due to the COVID-19 Pandemic, chronic absenteeism remains a nationwide problem, with students who experience chronic absence consistently falling behind their peers (Allensworth & Easton, 2007).

Students with Autism are consistently understudied concerning regulating chronic absenteeism (Totsika et al., 2020). Adams et al. (2021) reported that students diagnosed with Autism miss more school on average than their peers. Overall, students with Autism face more challenges at school, including sensory overload, bullying or isolation, executive dysfunction, mental health comorbidities such as anxiety or depression, and transition challenges, all of which may lead to school refusal (Bougeard et al., 2021; Miller et al., 2021; Price, 2022; Raymaker, 2022). Using Covington's (1976) Self-Worth Theory of Motivation, this project examines the impact of Autism Spectrum Disorder (ASD) on the attendance patterns of high school students. Chapter 2 will begin with a general overview of chronic absenteeism in California. It will then explore reasons why students with Autism struggle with chronic absenteeism. Next, it will examine factors that determine the academic achievement of students with ASD and how Self-Worth Theory connects with learning motivation. Chapter 2 will end with a discussion on strategies for increasing the academic motivation of high school students with ASD.

Chronic Absenteeism in Students with Autism

Chronic absenteeism has been declining since the COVID-19 Pandemic. According to the California Department of Education (2025), 18.6% of students were chronically absent during the 2024-2025 school year, a 5.7% decline from data reported during the 2023-2024 school year. These percentages are higher when compared to the national statistics. The United States Department of Education (2023) reported that during the 2022-2023 school year, 28% of students nationwide experienced chronic absenteeism. Even with percentages of chronic absence on the decline after the COVID-19 Pandemic, chronic absenteeism is still higher than pre-pandemic levels, and schools should continue to keep watch on and develop strategies for improvement, particularly the absence rate of children with Autism (Malkus, 2024).

When compared to children without Autism, children with Autism are more likely to struggle with chronic absenteeism. Adams (2021) reported that 72.6% of autistic children had shown persistent absence. This is a significant figure compared to their non-Autistic peers. However, current research is often inclusive when discussing high school students with Autism and their chronic absenteeism. Mattson et al. (2022) found a weak negative correlation between age and school refusal in students with Autism, demonstrating that as students with Autism got older, there were fewer instances of school refusal. However, the age range of these students in their study was between 3 to 11, and none of the students were in high school. In essence, studies of high school students with Autism are less prevalent, but they still share similar struggles leading to chronic absenteeism.

Covington (1976) believed that students' perception of self can impact their school attendance. Baumeister and Tice (1985) attempted to test Covington's (1976) Self-Worth Theory of Motivation. They reported that individuals with high self-esteem had the highest amount of motivation after experiencing great success. Conversely, lower academic achievement can negatively affect self-esteem and motivation.

Self-esteem is shaped by experiences, and students with Autism are at a higher risk of experiencing bullying (McClemont et al., 2021). Students with Autism are more likely to experience physical and emotional abuse by their peers (Bitsika et al., 2022) and struggle to fit in at school. Evans et al. (2024) affirmed that students with Autism experience higher reports of past interpersonal trauma, greater symptoms of anxiety and depression, lower self-esteem, lower authenticity, and lower participation in the Autistic community. Suffering from mental health issues is likely to impact self-esteem and, therefore, contribute to low achievement and a lack of academic motivation.

Students with Autism also experience difficulties socializing (APA, 2013). Gottfried (2014) noted that chronic absenteeism plays a role in poor socio-emotional development, demonstrating that students who are chronically absent from as young as kindergarten onwards struggle in social settings. In combination with lower self-esteem levels and higher risk of bullying, students with Autism experiencing chronic absenteeism have very low chances of succeeding academically.

Chronic Absenteeism and High School Academic Achievement

Gottfried (2014), a prominent scholar in the field of absenteeism, reported a strong link between low academic achievement and students experiencing chronic absenteeism. This section will examine chronic absence and its impacts on the academic achievement of high school students with Autism. This section will focus on three indicators of achievement that are common measurements of academic success for students with Autism: grades and Grade Point Average (GPA), graduation rates, and successful transitioning to mainstream classes.

Grades and GPA

Grades and GPA are the primary methods for measuring academic success. They are one of the leading factors contributing to college admission (Sawyer, 2013). According to the United States Bureau of Labor Statistics (2024), of the 3.1 million people ages 16 to 24 who graduated from high school between January and October 2023, 1.9 million, or 61.4%, were enrolled in colleges or universities in October of that year. This indicates that GPA is one of the leading factors for student motivation to succeed academically. Sanchez (2012) reported that chronic absenteeism has a large negative impact on GPA, meaning there is an association between lower-achieving students and chronic absenteeism. For students who had achieved a GPA of 3.0 or higher the previous school year, chronic absenteeism was associated with a decline of 0.30 grade points on a 4.0 scale, and for students who had achieved a GPA between

2.0 and 2.99 the previous school year, chronic absenteeism was associated with a decline of 0.21 grade points (Sanchez, 2012). This indicates that chronic absenteeism contributes to lower grades on average.

Although chronic absence has a negative impact on GPA, the impact on GPA did not change between students diagnosed with a learning disorder, such as Autism, and the general education population (Parrish, 2015, as cited in Christani et al., 2015). In essence, grades and GPAs are just as valid of a measure of progress and academic achievement for individuals with Autism as they are for their non-Autistic peers. It is noted that grading systems may be modified for students with Autism who are in special day classes as a means for support, specifically if they do not receive a modified curriculum (Drucker & Hansen, 1982; Munk & Bursuck, 2001a, as cited in Munk & Bursuck, 2003). However, despite their accommodations, grades are still a valid indicator of success, and poor attendance can still affect grades and GPA, which in turn impacts graduation rates.

Graduation Rates

Graduation is the goal for every high school student, regardless of their next steps in life. Allensworth and Easton (2007) suggested that chronic absence has a high impact on graduation rates. In their survey of Chicago Public School students, they found that those who missed one month or more of school during the school year had a predicted graduation rate of only 10% (Allensworth & Easton, 2007). They also noted that mild absence is a cause for concern, which means that just two weeks of absence per semester was associated with lower graduation rates, with only 63% of students who missed at least one week graduated high school in four years compared to 87% who missed less than a week (Allensworth & Easton, 2007).

In the 2021-2022 school year, the overall national high school graduation rate, as reported by the National Center for Education Statistics (2024), was 87%. Compared to that average, 71% of students with disabilities graduated. Approximately 13% of those graduate students have ASD (National Center for Education Statistics, 2024). These statistics show that graduation rates are a reliable indicator to measure the academic success of students with Autism in the same way as they can for general education students. Chronic absenteeism can negatively affect the graduation rates of both students with Autism and without Autism.

Transitioning to Mainstream Classes

Successful transitioning to a mainstream class from a special day class can be a marker of academic achievement for students with Autism, as inclusion is the preferred method for Autistic student placement (Gindi, 2019). Keane et al. (2012) reported that if students are properly prepared for transition into mainstream classes, 89% of students succeed in an inclusive environment and continue to receive the same placement for the following school year. The successful placement of students with Autism into the mainstream may involve re-evaluation of an IEP plan.

As students get older, they have more control over their own education, including students with disabilities on an IEP plan. By 14, students are required to participate in their own IEP meetings (Individuals with Disabilities Education Improvement Act, 2004). Students have been shown improvement in their self-advocacy skills, academic achievement, and socio-emotional learning when they participate in their own IEP meetings (Barnard-Brak & Letchenberger, 2010). This is significant because students with Autism may struggle in these areas, but having agency over their education may result in greater success in these areas. These skills of self-advocacy and a greater socio-emotional awareness are crucial for students in mainstream classes, and therefore, an increase in those skills will make transitioning into mainstream classes easier for students with Autism.

Additionally, an increase in self-advocacy and greater socio-emotional awareness and a feeling of agency can lead to an increase in self-worth in academic settings (Liu & Huang, 2019). The search for self-worth is crucial in adolescents from ages 14 to 18 (Snowman et al., 2009), especially in students with Autism, who have lower self-esteem than their peers (Bitsika et al., 2021; Khan et al., 2024; McClemont et al., 2021). Students with Autism who experience a successful transition to mainstream classes will have an overall sense of higher self-worth, which will, in turn, improve academic motivation.

Self-Worth and Strategies to Improve Academic Motivation

Students who are diagnosed with Autism are at a greater risk of being bullied at school, and their negative encounters contribute heavily to school refusal behaviors (McClemont et al., 2021). These students experience a lack of self-worth and are less likely to be motivated to attend school. Bitsika et al. (2021) found that 68% of children with Autistm were more likely to refuse school due to bullying, which included 75.9% of the sample being called mean names or being sworn at; 67.2% being joked about or laughed at; 63.8% being hit, pushed, or kicked; 55.1% having had something taken from them; and 56.9% being ganged up on; compared to 18% of their peers without a diagnosis who experienced these things. Overall, the lack of self-worth poses a challenge to motivation, leading to the need to examine how improving self-worth and motivation could impact chronic absenteeism.

Covington's Self-Worth Theory of Motivation posited that a human's highest priority is the search for self-acceptance (Covington, 1976; Weibell, 2011). Snowman et al. (2009) noted that self-concept, self-esteem, and appearance are of the utmost priority in the adolescent years of 14 to 18. This constant search for self-acceptance during these key years often results in students tying their self-worth to high achievement in academics in a process called academic contingent self-worth (ACSW), which can become detrimental for students who are not high achievers (Covington, 1984). A student who assures success may set their standards so low that the likelihood of failure is also low, but this strategy is a defense mechanism, and many students will remain doubtful of their abilities and accomplishments throughout their lifetime, cre-

ating insecure adults (Covington, 1984). In essence, when students have a low sense of self-worth, they are less likely to be academically motivated and interested in school. Setting their bars low to avoid failure does not improve their self-worth.

Students with Autism experience a greater number of challenges to their self-worth compared to their peers without Autism, and therefore experience a higher likelihood of refusing to attend school (Khan et al., 2024). Students with Autism also face several other challenges that may contribute to the lack of motivation to attend school. These challenges are sensory overload, masking, and differing levels of support.

Challenges for Students with Autism

The first challenge is sensory overload. Sensory overload is the idea that everything is overwhelming for individuals with Autism between many visual, tactile, and auditory stimuli experienced at once (Kern et al., 2007). This is a challenge because schools are an environment providing many of these stimuli at once, and without coping mechanisms developed through therapy, sensory overload can result in a lack of desire to attend school (Escoffier et al., 2025). The second challenge is masking. Masking is a coping mechanism adopted by many Level 1 low-support-needs individuals with Autism to fit in or appear normal to their peers without Autism (Miller et al., 2021). This can result in a lack of general self-worth due to the hiding of one's true self, which overall contributes to lower academic achievement (Covington, 1976). The last challenge is differing levels of support. Every individual with Autism, regardless of the level of diagnosis, receives highly individualized support. This presents a challenge not specifically to students with Autism but to teachers. Using a one-size-fits-all, holistic approach to educating students with Autism will not work, and supporting each student with Autism can be difficult, especially with diagnoses on the rise (CDC, 2024). This creates a dissonance between the amount of support an individual needs to receive and the amount of support a teacher may be able to provide. A student with Autism may experience difficulties learning if their support needs are not being prioritized (Assouline et al., 2012).

Academic Support Needs of Students with Autism

Although individuals with Level 1 Autism require less support than individuals with Level 2 or Level 3 Autism, that does not mean that they do not need support at all. Every student on the Autism spectrum is subject to similar challenges of sensory overload, task switching, executive dysfunction, or burnout (Miller et al., 2021; Price, 2022; Raymaker, 2022). A study by Paisley et al. (2023) revealed that general education teachers took on average 1.5 courses on supporting students with disabilities compared to special education teachers, who took an average of 11 courses on supporting students with disabilities. This indicates that while general education teachers may be generally informed on how to support students on the Autism spectrum as a whole, they may not be properly equipped to handle issues in functioning that may arise due to a

higher level Autism diagnosis. Due to this idea, it is beneficial to address all three levels of ASD holistically. Based on the research conducted by Paisley et al. (2023), all levels of Autism who are participating in general education classes, regardless of mild, moderate, or severe support needs, have the same access to resources, and therefore, should be addressed as if every level has the same access to academic support. With the proper support, individuals with Level 2 and Level 3 Autism can thrive in mainstream environments with mainstream markers of academic achievement.

The California Department of Education (2024) offers three main avenues to students with special needs in order to help them succeed. These avenues are classroom placement, IEPs, and 504 Plans. The following section explains how each avenue can accommodate and support students with Autism.

Classroom Placement

Classroom placement can allow students with Autism to experience challenges in a way that is comfortable for their level. Gindi (2019) discussed placement options for children with Autism: inclusion, special day classes, or special education schools. These options may change over time as a student progresses from primary school through middle school and secondary school. By the time a student on the spectrum reaches high school, they may be well-adapted enough for mainstream classes, because adolescents with ASD tend to learn how to function as well as their peers through developing observation and masking skills (Hull et al., 2017).

It is important to note that inclusion has been the preferred method of placement for students with Autism since the 1980s (Gomez, 2013). This means regardless of ASD, the default classroom placement is to include students with ASD in mainstream classes as much as possible. This raises the question: under what circumstances might a student with Level 1 Autism be placed in a special day class or a special education school instead of including them in a mainstream classroom? Gindi (2019) found that the relationship between diagnosis and placement is statistically insignificant. Although there was a greater percentage of students with Level 2 or Level 3 Autism in special day classes or special schools compared to students with Level 1 Autism, Gindi (2019) reported that the difference in levels of independence was statistically insignificant. This evidence shows that support needs across all levels, including higher-functioning Autism such as individuals with Level 1 Autism, may not be met by placement alone, and may require further support such as an Individualized Education Program (IEP) or 504 Plan.

IEPs

An IEP is a way to help students served under the Individuals with Disabilities Education Act (IDEA) to measure their educational progress. It is essentially an educational map for children with disabilities (Ruble et al., 2010). An IEP plan, as the name suggests, is developed with the help of the individual, as well as a team of the child's parents, teachers, and administrators or

school psychologists, who sometimes take on the specialized role of case managers. IEPs are typically reviewed and reassessed annually. Jung et al. (2007) stated that an IEP should include a students' individual strengths and needs, a timeline for improvement, and objectives that are specific, measurable, and observable by being connected to classroom activities. In 2010, however, Ruble et al. (2010) decided to address concerns that current IEP plans were not an efficient way of addressing the complexities of Autism. They found that overall, students with ASD did not meet the requirements or recommendations of IDEA indicators. They recommended students with Autism be evaluated with a separate tool and scale from other students with disabilities, and that the IEP should not be the single universal tool for all students. A more recent study conducted by Müller et al. (2023) suggested the contrary. They argued directly in response to the prior research performed by Ruble et al. (2010), stating that IEPs have seen significant improvements and that more tools regarding socio-emotional learning (SEL) and meaningful SEL goals on an IEP plan are far more feasible, and helpful for students with ASD and with SEL challenges.

504 Plans

Another option for accommodating students with Autism is a 504 plan. Although similar to an IEP plan, there are a few key differences, which Schultz (2022) outlined in an article published by the National Education Association. The main difference between an IEP and a 504 is that 504s are developed as a protection for a student with disabilities to participate in the classroom and receive appropriate education in the least restrictive environment. Although IEPs and 504s both exist to address the needs of individuals with physical and mental disabilities that directly impact their education, a 504 is issued when a student does not require special education services (Schultz, 2022). In other words, a 504 plan is utilized when the student does not require the kind of specialized instruction that an IEP provides, and therefore may not be as useful for certain students with Autism. A 504 Plan, however, may be useful for students with Level 1 Autism who require accommodations in a mainstream class, but do not require assistance with their grades,behaviors, and additional needs that are outlined as goals in an IEP. It may be particularly useful to students with Autism who experience absenteeism for any number of reasons, as a 504 Plan would ensure they still receive protection for their education.

Strategies for Increasing Academic Motivation

Chronic absenteeism is a complex issue with many contributing factors. Using the Kids and Teens at School (KiTeS) Framework, Melvin et al. (2019) defined the factors contributing to chronic absenteeism with four categories: chronosystem, macrosystem, exosystem, and microsystem and mesosystem. The chronosystem is a system that explains the overall growth and development of a child. It is the broadest level of the four and consists of how the passage of time affects development, such as behavior and motivation. The second level is the macrosystem. Macrosystem is the next level

of influence and consists of socio-economic resources, neighborhood, local environment, and government policy, all of which have their own beliefs, characteristics, culture, and traditions that can influence social construct. These factors impact the exosystem. The exosystem refers to the environmental context, such as community support services, extended family, school climate, and school type, that can indirectly shape behavior and identity. The final level, microsystem and mesosystem, has the most direct and explicit impact on a child. Factors such as peers, teachers, coaches, mentors, and parents are all in the microsystem. Interactions and relationships between microsystem factors construct the mesosystem. Because each child has their own unique identity—such as age, gender, race, and disability status—personality, characteristics, background, and history, including mental and physical health history, which Melvin et al. (2019) referred to as factors in the mesosystem, the dynamics of all relationships may differ.

Child development is a complex process and requires a holistic perspective to address chronic absenteeism and academic motivation. Melvin et al. (2019) believed that strategies for increasing academic motivation involve a complete view of the four systems in their entirety before concentrating on each level of the system. Furthermore, because all the levels are interrelated, simply focusing on one strategy without a comprehensive understanding of how all factors directly or indirectly influence change will lead to academic motivation remaining stagnant (Melvin et al., 2019).

At the chronosystem level, students may exhibit a change in motivation over time. This is significant when considering that students with Autism experience more bullying than their peers without Autism. Their experiences contribute to feeling resentful towards their cohort and therefore, they are less motivated to attend school (Bitsika et al., 2021). The government, which is at the macrosystem level, sets attendance laws. The laws play a role in school climate due to the way certain restrictions impact the attitude of staff and students. Community support services and school type at the exosystem level are also heavily influenced by the availability of socio-economic resources, the neighborhood, and the local environment. For example, fewer services are available in rural locations, and public schools in these areas are at a higher economic disadvantage because they have fewer resources than schools in urban cities. Finally, at the microsystem level, Melvin et al. (2019) delved into the factors that influence three different individuals who have an interrelated impact: the child, the school, and the family and parent. The child interacts with their school environment and their family and parents differently based on their age, gender, ethnicity or race, disability status, and health, all of which are factors at the mesosystem level. The family and parents interact with their child and the school environment differently based on each child's unique factors in the mesosystem level.

In essence, Melvin et al. (2019) created a way to address chronic absenteeism comprehensively. Attempting to address the motivation to attend

school at the microsystem or mesosystem levels without addressing the issues that influence the systems that encompass them will not yield any results. The motivation to attend school needs to be addressed with a top-down approach, as the factors that influence the motivation to attend school are more complex than addressing the factors individually.

Figure 1 summarizes the model explained by Melvin et al. (2019). It can also be used to understand their models holistically and examine the factors influencing the motivation to learn. This model was created for students in general education, but it can also apply to students with Autism, because all students, with or without Autism, go through the same rite of passage through adulthood and are in constant search for self-acceptance (Snowman et al., 2009). There are different strategies to increase academic motivation at each level, particularly the exosystem, microsystem, and the mesosystem levels.

Figure 1

KiTeS framework for school attendance and absence
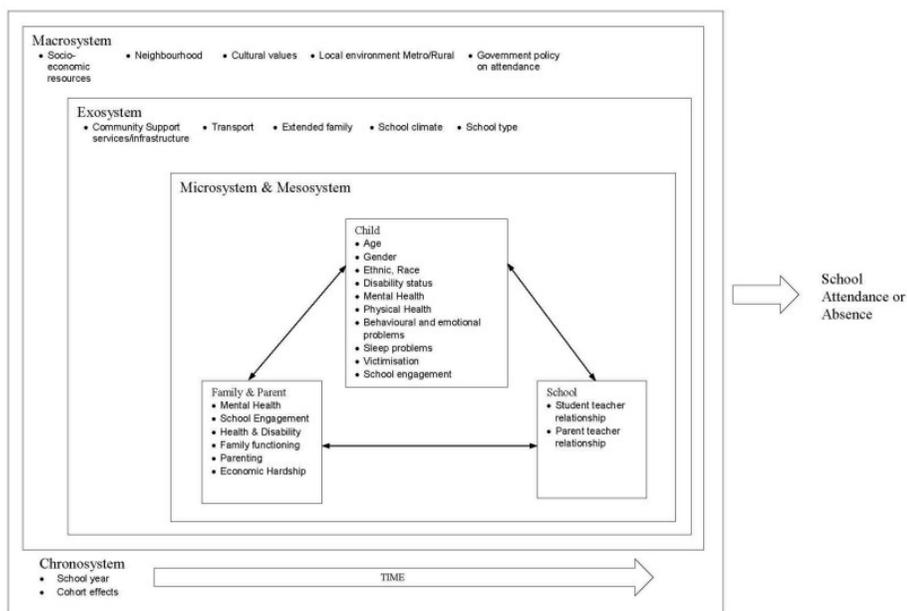
Note. This figure demonstrates how various factors influence school attendance or absence, organized into systems. From "The Kids and Teens at School (KiTeS) Framework: An Inclusive Bioecological Systems Approach to Understanding School Absenteeism and School Attendance Problems," by G. A. Melvin, D. Heyne, K. M. Gray, R. P. Hastings, V. Totsika, B. J. Tonge, and M. M. Freeman, 2019, *Frontiers in Education*, p. 4 (https://doi.org/10.3389/feduc.2019.00061). Copyright 2019.

Strategies at the Exosystem Level

The exosystem level consists of external elements that have an impact on students with or without special needs. These elements include community support services, extended family, school climate, and school type (Melvin et al., 2019). Although there has been an increased awareness of students with Autism and their educational needs (Liu et al., 2010), the education system at this exosystem level was initially built to support students in general education and ensure they receive access to education. Figure 1 shows that with this support system in place, general education students have a strong exosystem-based motivation to attend school. This model also shows that these elements at the exosystem level are just as important to motivate students with Autism even though the current education system may not have all the infrastructure to support them.

On average, general education teachers take 1.5 classes on special education compared to special education teachers, who take 11 classes (Paisley et al., 2023). This leads to the idea that teachers alone are ill-equipped to support students with Autism. Anderson (2020) argued that the lack of competence among school staff is the most common reason for school refusal behaviors in children with Autism, citing a survey that reported 24.3% of Autistic students refused school due to lack of adaptation in the school environment, 23.5% reported school refusal due to lack of support in learning, and finally, 23.8% reported school refusal due to lack of support in social situations. Overall, greater support at the exosystem level for students with Autism, particularly in the area of school climate, may result in an increase of school attendance and a decrease in school refusal behaviors.

One solution proposed by Brewe (2023) argued that adolescents with Autism need greater help transitioning from life at school into college and beyond, reinforcing the idea that support begins at the exosystem level. Brewe (2023) researched a method called the Stepped Transition to Employment and Postsecondary Success (STEPS) program for students with Autism transitioning into their lives beyond secondary school, and reported on the feasibility of implementing STEPS at the community level. They reported the success of the program by acceptability of the program, with a 91.67% retention rate across a sample size of 12 autistic individuals aged 16-35, a 96.27% session attendance rate, a high homework completion rate of 84.10%, and a high participant- and caregiver-reported satisfaction rate of at least 4 or better across all items on a scale of 1-5 (Brewe, 2023). If communities can integrate this program to support students with Autism in their transition to life beyond secondary education, there may be a reduction of stress and anxiety around attending and completing school, which was shown to be a reason for reduced attendance in students with Autism, and a greater motivation to attend school (Bougeard et al., 2021; Miller et al., 202; Price, 2022; Raymaker, 2022).

Increasing Motivation at the Microsystem and Mesosystem Level

Strategies from the microsystem and mesosystem levels can also im-

prove student motivation. Factors at the microsystem level form and shape human interactions and relationships. Family, teachers, and friends are all factors at the microsystem level that influence the socio-emotional well-being of students. Age, gender, ethnicity or race, disability status, and the mental health status of the people are factors at the mesosystem level that drive the proximity of relationships. For example, students who share the same age are more likely to foster a closer relationship, whereas a greater age difference without shared interests is likely to separate the human bond. Melvin et al. (2019) believed that the factors contributing at the mesosystem level interrelate and contribute to the microsystem level. They explained that factors in the mesosystem level, such as gender, race, and ethnicity, can influence the proximity of relationships students have at home, school, and community (Melvin et al, 2019), which in turn affect how they interact with the school environment and form their self-worth.

Parents also play a key role in increasing student motivation to attend school (Gottfried, 2019). Smythe-Leistico and Page (2018) found that when schools texted parents about ways to get their children to school, they saw improvement in attendance rates. This demonstrates that parental support is essential in determining academic motivation. Additionally, in a study performed by Schaffer et al. (2024) about the motivations for academic success in students with Autism, it is noted that among both students with and without Autism, parents play a key role in academic motivation, with students with and without Autism rating the need to make their parents proud as their number one motivation for academic success.

In addition to these factors, self-esteem plays a large role in the motivation to learn. Fairlamb (2022) noted that learning is hindered when self-worth hinges on being a successful student. Students need to build up their self-esteem without connecting it to academic milestones. This can be more challenging when students with Autism are known to suffer in areas such as social interaction (APA, 2013), but necessary in the process of forming self-worth. Mahoney (2023) suggested that an increase in peer-mediated intervention (PMI) may help increase the academic achievement of individuals with Autism. Particularly when students with Autism report higher rates of bullying than their non-autistic peers in general education (Bitsika et al., 2021), having peer support may lead to a positive impact on academic achievement, self-esteem, and motivation

To summarize, the KiTeS framework established by Melvin et al. (2019) is a holistic model that takes different factors into consideration when addressing self-worth and academic motivation of students. Increasing academic motivation requires effort from students, parents, the school, the community, and beyond, whether or not they have special needs or are ASD. Still, more research would be beneficial in developing support systems specifically to aid parents of children with Autism in motivating them to perform well academically.

Summary

In conclusion, Chapter 2 discussed the academic achievement of students with Autism and how self-worth and motivation are key factors to their chronic absenteeism. Chapter 2 concluded with support and strategies for increasing academic motivation. Chapter 3 will discuss the practice and policy implications of the impact of ASD on chronic absenteeism and provide recommendations for further study into this topic.

Chapter 3: Implications
Introduction

Regulations on school attendance have changed over the years to accommodate different types of absences (Burr et al., 2023; Goldstein, 2012; Weathers & Loeb, 2022). The most problematic type of absence is chronic absenteeism. In the United States, 28% of students were classified as chronically absent during the 2022-2023 school year (United States Department of Education, 2023). Although this rate decreased since the 2020 COVID-19 Pandemic, there is still a higher rate of chronic absenteeism than pre-pandemic levels (Malkus, 2024). The purpose of this project was to examine the impact of Autism Spectrum Disorder (ASD) on chronic absenteeism in high school students. It also explored possible reasons for their chronic absenteeism and the current systems regarding chronic absenteeism and their effectiveness for students with Autism. Despite many studies on chronic absence, there was little research that supported a link between chronic absenteeism and ASD (Totsika et al., 2020). However, the observed regular attendance rate for students with Autism in 2018 was 55.3% compared with 62.5% among students without Autism (Bowden et al., 2025); additionally, research supports the idea that students with Autism are more likely to experience chronic absence (Adams, 2021). The three research questions that guided this project were as follows:

What hinders high school students with Autism from being present at school
regularly?
Do poor attendance rates of high school students with ASD impact student achievement?
What motivational strategies can improve the academic motivation for high
school students with ASD?

Chapter 3 includes the conclusions of this project, the implications these conclusions have on school and state policies regarding students with Autism experiencing chronic absenteeism, and finally, recommendations for further study.

Conclusions

This project theorized that there is a link between chronic absenteeism and students with Autism and can result in an overall decrease in the rates of chronic absence. The literature review concluded that chronic absenteeism

does impact the academic achievement of all students, including students on the Autism Spectrum, with chronic absenteeism contributing to lower graduation rates, grades, and GPA (Allensworth & Easton, 2007; Christani et al., 2015; Sanchez, 2012). This implies that all students, not just students on the Autism Spectrum, are impacted by the problem of chronic absenteeism. In this project, academic achievement was measured in the same ways for both students with Autism and without Autism, which was significant because it demonstrated that all levels of Autism could be measured with the same benchmarks as students without Autism, and the only difference was the level of support. Despite limited research connecting ASD and chronic absenteeism for high school-aged students (Totsika et al., 2020), available data suggest chronic absence has a larger impact on students with than without Autism (Bowden et al., 2025).

Although chronic absenteeism is a problem for all students, students with Autism may need increasing amounts of support regarding chronic absenteeism based on their level of diagnosis and due to the challenges they experience that their peers do not. These challenges include masking, sensory overload, and different levels of support. High-masking individuals with Autism are more likely to experience higher rates of past interpersonal trauma, greater symptoms of anxiety and depression, lower self-esteem, lower authenticity, and lower participation in the Autistic community (Evans et al., 2024). Low self-esteem especially contributes to the lack of desire to attend school (Snowman et al., 2009), and this is reaffirmed by Melvin et al. (2019) through the KiTeS framework. Escoffier et al. (2025) noted that sensory overload makes attending school difficult for students on the Autism Spectrum. Preece and Howley (2018) saw an increase in the academic achievement and engagement of students with Autism when those students felt like their identity was validated. Thus, meeting students with Autism at their needed level of support is crucial. These challenges impact students with Autism on a greater level than their peers without Autism, making them less likely to attend school.

Finally, this project explored possible motivational strategies to inform about the current systems designed to support students with Autism in school. Increasing academic motivation requires effort from students, parents, educators, stakeholders in the community, and beyond, regardless of general education or an Autism diagnosis. Programs such as Stepped Transition to Employment and Postsecondary Success (STEPS) for students with Autism transitioning into their lives beyond secondary school would be a feasible strategy to implement at the community level. A universal support system designed specifically for educators or parents may be necessary to provide the proper academic support for all students, but especially students with Autism.

Practice Implications

Based on the conclusions about ASD and chronic absenteeism, a few issues arise with practices within the classroom. The first thing that needs to be addressed is the lack of education for general education teachers. General

education teachers take fewer classes on special education compared to general education teachers, implying that teachers alone are ill-equipped to support students with Autism (Paisley et al., 2023). Lack of competence among school staff is cited as the most common reason for school refusal behaviors in children with Autism, with 24.3% of students with Autism refusing school due to lack of adaptation in the school environment, 23.5% refusing school due to lack of support in learning, and finally, 23.8% refusing school due to lack of support in social situations (Anderson, 2020). Overall, these conclusions support the idea of a learning model that is adaptive and supportive of both educational and social needs. General education teachers can receive more classes on supporting students with disabilities, offer more engaging lessons in the classroom to support student interests, and create sensory-aware classrooms by reducing lighting and providing students with sensory tools without negative stigma.

Policy Implications

At the state and national level, the current practices regarding chronic absenteeism are not supportive of the needs of students with Autism, heavily catering towards students who do not have disabilities. To counteract this, states need to review their attendance policies and evaluate their current effectiveness for all students. They also need to review the KiTeS framework (Melvin et al., 2019) to ensure that all students are represented in their policies. States also need to integrate the Stepped Transition to Employment and Post-secondary Success (STEPS) program or similar means for helping students with Autism transition into adulthood—this may include educating communities on how to use the STEPS program and how it applies to students with Autism. Additionally, states can require sensory-friendly environments as a part of the Americans with Disabilities Act (ADA) to help accommodate for difficulties with sensory overload. Finally, an increase in funding for in-school mental health professionals and behavior specialists, as well as transportation and therapy for at-risk students would be useful.

Directions for Future Study

The first limitation of this literature review is the amount of information available on students with Autism at the high school level. Autism is a life-long disorder; however, most services such as therapy and social skills training are provided and used during early and middle childhood (Song et al., 2022), meaning fewer resources are provided during the crucial years of late adolescence. As this project progressed, it was clear that there was more literature investigating elementary-age children with Autism and very little literature on high-school-age children. Despite the above-average risk for absenteeism and a majority of chronic absenteeism occurring at the high school level, as students with Autism got older, there were fewer instances of school refusal (Mattson et al., 2022). While fewer instances of school refusal in high school students with Autism may be in part due to increased level of masking causing the characteristics of Autism to be surpressed (Hull et al., 2017), there is still

something to be said about participation in one's own schooling playing a factor in the choice to attend, or refuse to attend, school. The KiTeS framework suggested that a students' age, disability status, mental health, school engagement, and student-teacher relationship all play a role in the desire to attend school (Melvin et al., 2019), which implies that the less involvement or choice a student has in their own schooling, the less likely they will be to attend school. This is significant because if a student does not feel represented or supported, specifically students on the Autism spectrum, they may be less likely to attend school, as the Self-Worth Theory of Motivation suggested (Covington, 1984). More research on the link between high school age students and ASD would be helpful for future study because it can help open up the possibilities for students with Autism taking more agency over their education, therefore helping to close the attendance gap and understand why students with Autism are missing school.

The last limitation from this review of literature was that it did not examine boys and girls on the Autism spectrum separately. Girls are highly underrepresented in research on Autism, with boys being four times more likely to be diagnosed than girls (D'Mello et al., 2022). This is especially important when considering that girls learn much earlier in their development how to mask traits of Autism (Lai et al., 2015), and masking is a challenge that many students with Autism face daily in the classroom, which causes greater levels of anxiety surrounding school attendance (Evans et al., 2024). Because gender is a factor on the KiTeS chart that influences absences, this statistic would be important to investigate. A more in-depth study with designations on gender could lead to the next steps in this research.

Summary

This paper aimed to connect chronic absenteeism with ASD in high school students. Chapter 1 explained the problem and purpose of this project. Chapter 2 focused on literature connecting Autism and chronic absence. It explored factors that determine the academic achievement of students with ASD, and how Self-Worth Theory connects with learning motivation. Chapter 3 included the results of this study and implications for practice and policies both at the school and state level, and recommendations for further study.

Students with Autism face many challenges in learning in school (Evans et al., 2024). These challenges also present a number of issues to self-esteem, resulting in more anxiety about school. A universal support system designed for educators, parents, and their community is necessary to provide the proper academic support for all students, but especially students with Autism. Additionally, an individualized review plan of the risk factors that influence student absence may be necessary. For this to be implemented, changes to policies at the school and state level, such as mandatory sensory-friendly environments, the implementation of the STEPS program, or more purposeful training for general teachers on topics relating to students with ASD and similar disabilities, need to occur in order to improve the chronic absenteeism of high school

students with Autism.

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Smart Phones in the Classroom: An Investigation of the Impact on High School Student's Academic Performance

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Abstract

Due to widespread usage in high school classrooms, smartphones present both advantages and disadvantages for student motivation and learning outcomes. Distractions like social media and gaming are often brought on by the increasing popularity of cellphones, which hinders mental and academic performance by dividing attention and adding to mental stress. This research investigates ways to encourage responsible use of smartphones while examining the effects of frequent use on high school students' cognitive engagement, academic achievement, and learning opportunities. Establishing a baseline understanding of the effects of smartphones and suggesting digital literacy and classroom management techniques that encourage regular participation, self-direction, and in-depth learning are the objectives. The findings illustrate the usefulness of explicit guidelines, including areas that are off-limits to smartphones, in developing a collaborative learning environment in the classroom by reducing distractions and improving self-discipline. Including digital literacy in the curriculum offers students the tools they need to use smartphones responsibly, utilizing learning applications and group projects to improve education and build relationships. Incorporating organized digital literacy classes and interactive mobile games can help students stay focused and advance their academic goals. In order to maintain a balance between limitations and instructional use, policy guidelines favor cooperative, controlled smartphone policies.

Chapter 1: Introduction to the Project
Background

Smartphones are a typical part of high school life and are firmly embedded in the social and academic lives of youth. The Pew Research Center (2022) found that 95% of respondents aged 13 to 17 in the United States said they had a smartphone, and half of the respondents said they are online almost constantly. Smartphones have infiltrated classroom contexts as well, leading to what Selwyn and Aagaard (2021) refer to as the "educational technology paradox," whereby educational tools support learning but also impede learning. On the one hand, smartphones provide opportunities for personalized access to information, leverage digital collaboration, and promote engaging student-centered learning. On the other hand, smartphones are distracting and encourage fragmented attention. Since adolescence is a period of identity

construction, managing peer relationships, and increasing academic pressure, it is important to explore how smartphones impact adolescent motivation and academic performance.

Keeping students' motivation has always been a foundation of good education, but the near-constant presence of smartphones adds reality to that mission. Radesky et al., (2020) have expressed worries about the effect technology and the ever-available online content has, and will continue to have, on students. For many students, this digital access makes engaging with other students, self-regulation, and high-quality and depth of learning difficult. Hartley et al. (2020) states that students' cognitive ability relies on factors, and distraction is a negative to those factors, that could take away the ability to increase cognitive function Hartley et al., (2020). Without deliberate structure, smartphones have the potential to compromise the nature of learning, drawing students into shallow processing instead of deep engagement. With intentionality, these devices can also serve as cognitive tools that allow students to engage meaningfully and still have agency in how they want to engage with materials (Sharples et al., 2015).

Engaging in Cooperative Learning (CL) is one advantageous way to generate motivation and use smartphones (Low and Van Ryzin (2021). CL inherently involves (a) organized social interaction, (b) responsibility for group learning and, (c) cooperative problem-solving, all of which function to amplify academic and social outcomes. For example, Low and Van Ryzin (2021) used a randomized trial to show that CL using devices including smartphones, not only resulted in academic gains but also improved students' mental health and emotional regulation. Students in CL environments developed more pro-social behaviors and noted feeling better connected with each other, creating a safer and more focused learning atmosphere (Low and Van Ryzin (2021). These findings are especially relevant in today's classrooms, which, in many cases, may still face continuing obstacles in students' re-establishment of social-emotional and academic resilience.

Even with promising practices, there is still a significant implementation gap. Many teachers report feeling inadequately prepared to use smartphones. A national survey by Common Sense Media (2022) found that more than 80% of teachers were worried about smartphones being a distraction, yet less than a third indicated any formal training or support on how to use phones in their teaching. As Green and Batool (2021) stated, "In the absence of pedagogical support, educators are forced to learn by trial-and-error, often resulting in phone bans rather than balanced practices" (4). Feeling unprepared highlights the need for professional development that empowers teachers to navigate students' purposeful and regulated access to digital spaces.

Overall, the question of smartphones in the classroom is not if, it's how Smartphones can disturb learning with distractions, such as social media, notifications, which can impact the focus and engagement needed. However, when used intentionally, learning can be augmented with smartphones using

mindful practices such as collaborative group projects and mindfulness exercises, that would create academic success and self-regulation and motivation (Kuznekoff et al., 2020). Smartphones can both help and promote student success in general academics and digital contexts. Smartphones offer educational tools and collaborative platforms, and at the same time can be a distraction by allowing social media and notifications (Sunday et al., 2021). Working with the communities to co-create these contexts help to reinforce classroom practices that are evidence-based, culturally responsive, and holistic of students and how they come to their presence in secondary school in the context of their devices (Troll et al., 2024). The structured use of smartphones may be beneficial when boundaries are upheld, but pose major risk if students are left to use these devices as they please.

Statement of the Problem

The increased use of personal smartphone devices across high school classrooms presents a multitude of challenges. Ultimately, smartphones can be seen as convenient devices that can facilitate learning, if managed well, however they also come with challenges such as numerous distractions, increased exposure to cyberbullying, and negative implications on student's mental health and motivation (Common Sense Media, 2022; Pew Research Centers, 2022). Notably, adolescents, who are already prone to multitasking and digital over-stimulation, tend to struggle with cognitive processing and sustained attention following instruction (Hartley et al., 2020; Skowronek et al., 2023). Still, many educators want to utilize smartphones for teaching purposes, like educational games and collaborative apps, to engage students while maintaining instructional relevance (Low & Van Ryzin, 2021).

Nevertheless, these efforts introduce concern in their implementation. In many cases, it can be challenging for a teacher to make sure that students are using their smartphones properly - especially in larger classes where there is not enough time to keep track of all the students (Green & Batool, 2021). For example, while some school-based platforms enable screen-sharing or limit students' access to apps that have been approved using student email accounts, these platforms tend to work better with laptops than a phone due to compatibility limitations and screen sizes (Green & Batool, 2021). If students forget their laptops or simply do not have access to school-issued laptops, phones may be used as backup learning devices. However, the downside is most likely delaying school activities not only with potential texting but also from the temptation of engaging with social media, advertisements, or games that may distract them away from learning objectives.

Even though there has been a growing number of studies conducted on smartphone use in postsecondary contexts, a lot less is known about the broader developmental and social impacts of smartphone addiction, especially concerning high school age adolescents (Sunday et al., 2021). This gap is essential, because high school is a significant time for social and emotional development, and by engaging in excessive smartphone use, smartphone addiction

may affect self-regulation skills, peer connections, and academic performance (Troll et al., 2024). Moreover, it remains unclear what habitual smartphone use in the classroom and beyond may have on students' capacity to build and maintain respectful peer relationships, how they respond to authorities, or the development of self-regulation and life skills which are critical for success in high school education and for resilience in general. Twenge (2023) drew attention to the detrimental impact of excessive screen time on adolescent mental health and social development. Furthermore, Hinduja & Patchin (2022) pointed out that adolescent habitual smartphone use can lead to problems such as cyberbullying. Learning in a digital age requires both purposeful use of technology and an understanding of how the use of such tool's influences behavior and social affiliation.

The increasing tension between the possible incentives and evident disadvantages of smartphone use has highlighted a critical area of research: (a) how, if at all, does the habitual use of a smartphone in a high school classroom influence students' motivation and success? (b) More importantly, in what ways can educators and school systems facilitate students engaging with smartphones to ensure consistent engagement, self-directedness, and deep learning? Without more knowledge about how smartphones may engage with students' academic behaviors and motivational patterns, educators may overlook opportunities for providing their students with success in school and developing competencies that lead to academic persistence in the future.

Purpose of the Project

The purpose of this project is to explore the use of smartphones in high school classrooms by creating a baseline understanding of the possible impacts of smartphone use concerning high school students' cognitive engagement, academic performance and, learning opportunities. Many adolescents have smartphones with habitual use reported during the school day (Pew Research Center, 2022), and it's up to teachers to leverage the affordances and limitations of smartphones as technologies. The affordances of smartphones may include potential educational opportunities to provide new paths to accessing instructional materials and resources, support additional collaborative learning experiences, and allow for differentiated instruction (Gupta & Manches, 2022). Conversely, smartphones may provide new pathways to cognitive distractions, short attention spans, and diminished academic performance (Aagaard, 2023). In an educational environment where mobile technologies play a more prominent role in learning experiences, evaluating the use of smartphones and impacts on professed cognitive engagement and academic outcomes becomes necessary.

Low & Van Ryzin (2021) have addressed this in detail, for instance, in the cooperative learning (CL) framework which focuses on enhancing learning and social-emotional outcomes, behavior, and student well-being. These examples help us situate smartphones and mobile technologies not in good or bad terms, but in their nature of being able to enhance or diminish learning in

the hands of a user. Therefore, any educational technology makes it critical to develop an understanding of what it is and is not in the academic environment from both the educator and student perspective. Furthermore, mindfulness has emerged to allow students to engage with technology more strategically. When purpose-driven and intentional, mindfulness can support greater engagement and attention while also curving most digital distractions in a way that allows students to focus and engage in their academic work (Askara et al., 2024).

Moreover, this project aims to investigate how the usage of smartphones intersects with intrinsic and extrinsic motivation. Since motivation is an important element of adolescent development and academic achievement, educators must know whether smartphone presence provides students with motivation to learn and build their character or diminishing motivation that already exists. Recent research has documented that students who have smartphones noticeably incur decreased available cognitive capacity just by the presence of the smartphone (Skowronek, Feng, & Lee, 2023). This leads to more questions regarding the balance one must take between accessibility and attentional cost.

The primary goal of this study will be to explore how smartphone engagement relates to the learning experiences of high school students. Students occupy a unique position in high school as they enter postsecondary education or the workforce as they maintain their engagement in society that is rapidly digitizing (Anderson, 2023). It is critical to educate students in a mindful, goal-directed, and recognized way to engage with technology. This paper will review how smart devices influence students' intrinsic motivation and accomplishment and explore new avenues for adjusting teaching during this digitized time of schooling, for the continued growth and progress of students. Whether a smart device promotes school learning or detracts from a student's ability to engage as a learner will depend on the role of smart devices societal as a culture, in the educational institution, and in the practices of educators, whether purposeful, useful or as disengaged opportunist (Crompton & Burke, 2022).

Theoretical Framework of the Project

Lev Vygotsky's Sociocultural Theory contends learning is a social activity or takes place through interactions with a more knowledgeable other (MKO) within the learner's culture and environment (Medical College of Wisconsin, 2022). Central to the theory is cooperation and the use of mediated tools so learners can develop cognitive concepts and skills. The prevalence of smartphones in teaching and learning contexts presents advantages and formidable challenges, as smartphones become commonplace, educators must strive to examine how students are using smartphones, as well as what learning attention, engagement, and outcomes are related to student smartphone usage (Hartley et al., 2020).

From a sociocultural perspective, smartphones can have a mediational function in the Zone of Proximal Development (ZPD) which is the distance between what a learner can do without help and what they can do with help (Medical College of Wisconsin, 2022). When smartphones are incorporated

intentionally, as mediating devices, they can provide access to resources and collaborative spaces that can enhance learning experiences. For example, educational apps and online discussion forums can support peer-to-peer engagement and instantaneous feedback, thus providing more scaffolding guidance, which is consistent with Vygotsky's sentiment that social interaction is important to cognitive development (Chiu, 2021). Conversely, if smartphones are not regulated or used productively, their use can disrupt or prevent learning by taking attention away from the instructional task or limiting opportunities for participation in a meaningful way within the ZPD.

Learning is inherently sociocultural and is profusely situated in social interactions and socially mediated through the availability of cultural tools that support cognitive development. When integrated meaningfully into the learning context, smartphones, such as cultural artifacts, can effectively mediate the process of development. For example, educational apps, digital discussion environments, and online referencing can all act as tools to assist peer-to-peer interaction and provide structure and support for learning situated within the Zone of Proximal Development (ZPD) and thereby represent a means to shared meaning (Chiu, 2021). Scholars suggest students engage in social mediation which supports cognitive growth when they use smartphones to aid discussion, collaboration, and guided exploration of topics (Medical College of Wisconsin, 2022).

Contrarily, the educational utility of smartphones and the extent to which students are engaged in on-task social interaction for meaningful learning is seriously diminished by the use of smartphones for off-task behavior during instructional time. Off-task use of Smartphones impairs students' ability to engage with more knowledgeable others (MKO) and limits their movement within the ZPD (Hartley et al., 2020). Therefore, smartphones are not a neutral context for learning, and their educational effectiveness is largely dependent upon how they are nested with the social interactions and instructional practices of the context where learning takes place.

From a sociocultural perspective, learning occurs through social activities and using cultural artifacts to mediate cognitive development (Chui, 2021). Both constructive and educational use of smartphones in learning situations is educational (e.g., apps, forums, and other learning resources) in that it leads to opportunities for collaborative learning. Smartphones also connect learners to other peers in the classroom to create an educational scaffolding for participation, sense-making, and knowledge-building located in the zone of proximal development (ZPD) (Nguyen & Patel, 2023). In this way, Ray & Hazari (2022) conclude smartphones are cultural tools that can help learners have socially mediated discussions, collaborative work, and exploration, all of which fit within the social unfolding of knowledge and cognitive development (Medical College of Wisconsin, 2022). In the same way, unproductive uses of smartphones, or activities that do not support educational aims or participation, can unsettle communication with peers and foreclose discussions with MKOs leading to

diminished opportunities to engage in active learning in the ZPD (Hartley et al. 2020; Smith & Lopez, 2022). In this way, it should be noted that smartphones are not neutral, educational, learning, or developmental means; rather they can be educational depending on how they are applied in the learning environment.

Evidence from empirical research illustrates that smartphone usage may adversely affect dimensions of executive function, such as working memory and cognitive control, that are significant for self-regulated learning (Warsaw et al., 2021). These cognitive processes cannot be fully understood separately from a sociocultural point of view, as they are informed and instructed through social interactions as well as participation and engagement with cultural tools. Disruptions in the form of notifications or multitasking can tax an overloaded learner's cognitive resources, which reduces the chances of and connections with any meaningful collaborative learning processes that support the development of cognition. Notably, cognitive capacity can also be diminished by the mere presence of a smartphone. Pupils need to use mental effort, to suppress the impulse to check their smartphone, in these instances mental resources that could be best used toward learning and the processes in question (Skowronek et al., 2023). Even instances when a smartphone is supposed to enhance learning potential, ungoverned cognitive demands may limit the disposition of shared attention, diagnosis of problems, or engagement in activities in the learner's Zone of Proximal Development (ZPD). Thus, if only for saving mental/ cognitive effort when attracting smartphone usage into school, it is worthwhile to be strategic in its design, to limit cognitive investments required for important social engagement, learning and integration.

The ramifications of smartphone use in classrooms move deeper than personal cognitive processes; they infiltrate the basic relationship between teachers and students. As students rely on technology to acquire information, they no longer may need to see the teacher as provider of that information. The teacher must notice here that the sociocultural approach to learning requires them to be facilitators that help students learn in the forms of learner and guide them in their navigation of digital resources in their ZPD (Medical College of Wisconsin, 2022). This ecology demands intentional strategies that will utilize smartphones to promote mediated, collaborative, and critically aware learning instead of distracting learning. Schooling intentionally includes smartphones into instructional practices which enhance students' engagement with academic content-related to the faith-based or interest-based learning they are engaged in while reinforcing the sociocultural understanding that learning is a mediation of social phenomena, cultural tools and shared activity.

Definition of Key Terms

Smartphones in the classroom are not inherently a hard topic to comprehend; however, the terms used in the research studies may be. The following terms are described to help clarify what they mean in relation to this study. They have other meanings in different contexts, but they are defined to explicitly pertain to this research.

Cognitive load: The total effort being applied mentally to allocate information. In the context of smartphones in the classroom, cognitive load can refer to how the presence of smartphones, or multitasking, has an impact on a student's ability to allocate, process, and retain academic knowledge (Sweller, 2011).

Executive Function: A collection of cognitive processes needed for self-regulation, including working memory, cognitive flexibility, and inhibitory control. They are crucial for academic success and other goal-directed behavior. Executive function may be facilitated or hindered by the use of smartphones depending on how they are used (Diamond, 2013).

More knowledgeable other (MKO): Is a person or tool proceeding to assist a learner within their ZPD. A MKO can be a teacher, peer, or a digital tool such as a smartphone that mediates one's learning and cognitive development (Vygotsky. 1978).

Scaffolding: A teaching method designed to supply students with support that allows them to do the things they could not do independently. As students become more competent, the teaching support gradually fades away, making the students more autonomous learners. Scaffolding could mean that when it comes to using a smartphone, we are using mobile apps or online tools to scaffold student learning in the case of their learning (Wood et al., 1976).

Technological Pedagogical Content Knowledge (TPACK): A framework that takes into consideration the use of technology within pedagogy and content knowledge in one's teaching. Teachers need to be able to use the technology appropriately (e.g., phones) for purposes of teaching and learning while also ensuring the subject matter and students are engaged (Mishra & Koehler, 2006).

Zone of proximal development (ZPD): A concept from Vygotsky's sociocultural theory that defines the gap between what the learner can do alone, and what they can accomplish with assistance from a more knowledgeable other (MKO). The ZPD emphasized that learning may be at its best depending on how well and the amount of support students might receive when learning (Vygotsky, 1978).

Summary

Smart phones have several significant risks and benefits that can be engaged with and examined; however, it is important to reflect on the risks and benefits in order to facilitate the best experience for students. For example, smartphones can link students with online communities and educational resources increasing students' connections to unlimited learning possibilities and access to information (Crompton & Burke, 2022). For others, risk might include being manipulated into accepting misinformation, contributing to or being a victim of, cyberbullying, and accepting social pressure (Hinduja & Patchin, 2023). Current literature seems to indicate smartphones in education have a complex role, and may increase engagement, but the risks outweigh the benefits (Aagaard, 2023). When we also consider the fact, smartphones provide a medium in which learning opportunities may be made visible to the learner

while signifying major social and cognitive barriers to learning, we are interested in continuing researching in this area.

In addition, this paper discusses some of the psychological and emotional aspects of smartphone usage, especially by adolescents. The research seems to suggest that continuous engagement with a digital reproduction of life online correlates with stress, anxiety, and decreases in self-esteem (Twenge, 2023). The social comparisons framed through curated content on select social media platforms, often validated by algorithms, can create an unhealthy digital ecosystem that may increase mental health issues (Vogel & Rose, 2024). These environmental connecting factors indicate that the psychological ramifications of smartphones are not an isolated contributor to the larger technological and social systems.

Purposeful awareness about smartphone usage in learning environments will create learning environments that foster academic, emotional, and social development. Furthermore, being aware of both the opportunities and challenges associated with using smartphones in educational contexts will help educators, staff, and learners to make more purposeful choices, and use digital technologies with intention. Overall, this is valuable information for any stakeholder engaged in educational contexts, as it may serve as a useful sounding board to think about how we navigate the use of smartphones in order to position student learning for growth, rather than minimizing it.

Chapter 2 will build on these ideas by digging deeper into three specific areas where smartphones make a real difference (a) student motivation, (b) relationships between teachers and students and, (c) the effects on academic performance.

Chapter 2: Review of Related Literature
Introduction

Smartphones are now a big part of everyday life for high school students, and they're showing up more and more in classrooms. For educators, this brings both exciting opportunities and serious challenges. On the positive side, smartphones can give students flexible ways to learn, access resources, and work with others. However, at the same time, they can easily pull students' attention away from what they're supposed to be learning. Selwyn and Aagaard (2021) call this the 'educational technology paradox'. Technology can be both a helpful learning tool and a major distraction. Lin et al. (2023) make a similar point, noting that while smartphones can encourage communication and quick access to information, they often lead to multitasking and reduced focus. Together, Lin et al. (2021) and Selwyn and Aagaard (2021) show how complicated smartphone use is in education.

When there are no clear rules or structured ways to use smartphones in class, they often end up doing more harm than good. Hartley et al. (2020) found that students often drift into non-academic activities like scrolling through social media when there's no guidance on phone use. Skowronek, Feng, and Lee

(2023) also found that this kind of off-task behavior hurts focus and makes it harder for students to stay motivated. These studies show that without clear expectations, smartphones can become a major source of distraction. Nonetheless, that does not mean smartphones are always a problem.

In fact, when teachers give students specific, purposeful ways to use their phones—such as group work or mindfulness activities—they can actually support learning. Low and Van Ryzin (2021) found that students were better at managing their emotions and staying on task when phones were used as part of a structured plan. Morin et al. (2021) saw similar results noting that when smartphone use is guided by clear goals, students are more engaged and focused. These findings suggest that it's not about whether phones are used, but how they're used that makes the difference.

Chapter 1 has made it clear that context matters when it comes to smartphones in schools. Zhao et al. (2022) explained that the impact of smartphones depends heavily on how they're integrated into learning—when used intentionally, they can support deeper engagement. Kim et al. (2023) added that when students know exactly how they're expected to use their devices, they tend to stay more focused and get more out of class. Together, Kim et al. (2023) and Zhao et al. (2022) highlight the importance of structure and intentionality in using phones for learning.

Another important takeaway is how much classroom management matters. Choi and Kim (2021) found that students tend to do better in environments where teachers set and maintain clear technology rules. Thomas and Anderson (2023) also found that when expectations are consistent, students are more likely to respect the learning space and feel more connected to their teachers. These findings show that strong classroom routines can make smartphones part of a positive learning environment rather than a distraction.

Chapter 2 will build on these ideas by digging deeper into three specific areas where smartphones make a real difference on student motivation, relationships between teachers and students and the effects on academic performance.

The Effect of Smartphones on Student Motivation in Classrooms

Smartphones can affect students' motivation, sometimes in contradictory ways, either facilitating positive motivation or undermining motivation altogether, depending on the context and the students. We are concerned about students' cognitive resources, especially regarding the presence of smartphones in the classroom because they engage cognitive resources and inhibit motivation. Skowronek, Feng, and Lee (2023) point out that students' available cognitive capacity is consumed simply by the presence of their smartphone - even if it is turned off. Smartphones may consume students' attention and cognitive energy toward instructional tasks and infect goal setting, self-regulation, and intrinsic motivation. Hartley, Harlow, Chidgey, and Visser (2020) have arrived at similar findings to those of Skowronek, Feng, and Lee (2023), regarding the cognitive functions related to distraction by digital environments and tools that

can threaten engaged, productive, academic motivation especially when adolescents are facing self-regulation challenges and require attentional flexibility.

Attention is hard to keep from high schoolers at an academic level and digital environments make it more challenging for the educator to keep students focused on an academic task. This issue is especially important because high schoolers represent a significant period of developing (a) motivational frameworks, (b) identity and, (c) self-regulated learning behavior. Motivation revolves around both an intrinsic desire to feel competent and external factors such as recognizing the social value of learning, academic achievement, or demonstrating competence in a sport or activity (Reeve, 2020). When smartphones interfere with students' ability to regulate their time, filter distractions, or deeply engage cognitively with the material, they may be suppressing both intrinsic motivation and extrinsic motivation altogether. Students may find temporary fulfillment through immediately engaging in social media and entertainment apps, but such engagement likely does not fulfill academic goals or lead them to long-term personal pursuits.

However, research also shows that smartphones can enhance motivation, engagement, and peer interdependence (McCoy et al., 2023) when used intentionally and within appropriate programs designed for cognitive and emotional. Low and Van Ryzin (2021) demonstrated that when cooperative learning (CL) activities involved smartphones, they produced greater academic gains while also improving (a) emotional regulation, (b) social connectedness and, (c) pro-social behavior. All positive effects on motivation are likely driven by the students' willingness to succeed collectively, which can depersonalize the smartphone from a distracting artifact to a device that facilitates responsibility, collaboration, and perceived purpose, thus enhancing motivation.

Mindfulness

Mindfulness-based approaches demonstrate more potential in using smartphones as motivational support. Askara et al. (2024) observed that when students are first taught to engage mindfully with their phones, the students become more tactical in their interactions within digital spaces. Purposeful smartphone use empowers students to build awareness about when and how technology supports their learning intentions which can promote metacognitive processes and enhance intrinsic motivation. Educators can help students make intentional decisions about when to engage with digital tools, actively mitigating passive scrolling and promoting deeper levels of academic engagement.

Smartphones have become synonymous with the high school student's everyday world. They serve as both a benefit and a challenge in ways that influence learning inside the classroom. Smartphones make learning easier through the use of educational apps and collaborative tools, although they present the large distraction of social media, internet browsing, and texting. High school students become distracted from their primary work, which leads to disengaged and minimized attention (Flanigan & Titsworth, 2020). Distractions affect cog-

nitive processes, and self-regulation/motivation are crucial components needed for future success in school (Chen, Nath, & Tang, 2020). Students that are self-regulated can focus longer and are then able to learn better themselves.

Social Interactions with Cultural Tools

Additionally, Vygotsky (1978), from a sociocultural perspective, indicates that learning takes place through social interactions and with cultural tools situated in one's environment. Appropriately used smartphones act as cultural tools that can stimulate collaborative learning and cognitive development (Selwyn & Aagaard, 2021). However, as with the example above, if not appropriately used, smartphones can move students outside of their Zone of Proximal Development (ZPD) and cause problems for engagement in meaningful learning experiences. For example, there is evidence that off-task indirect multitasking through social media during class is correlated with reduced academic achievement and disengagement (Deng, Zhou, and Hu, 2022). This extends to socially mediated educational processes, in which students do not experience extreme distractions.

Texting

Texting in class, a type of digital distraction in schools, has also been shown to be associated with reduced comprehension and memory retention (Flanigan & Titsworth, 2020). Breaking classroom learning, where instant messages interrupt the presentation, make it significantly more difficult for students to process information and remember information. In addition, teachers have found the management of distractions related to smartphone use while delivering a meaningful learning experience overwhelming. McCoy (2020) expressed that students are more likely to utilize smartphones for non-academic purposes without the preparation and application of strategies and policies for their use, creating a block for meaningful instruction and disruptions to classroom ecosystems.

Distractions and Interruptions

This agrees with Vygotsky's claim that learning is a social construct, and an unorganized digital environment hinders the shared learning context and cognitive development of each student in the context (Vygotsky, 1978). Smartphones hold educational possibilities when used for appropriate tasks but the distractions on social media, internet searching, and texting create significant distractions for learning in high school classrooms. These distractions impede productive engagement, cognitive processing, and the collaborative effort of learning. The point of consideration is how can smartphones be used as tools in the learning environment from a sociocultural view? Educators need to create intentional strategies or digital literacy practices that will place the smartphone as a productive tool in a student's Zone of Proximal Development (ZPD), and not obstacles.

Lee and Kang (2023) found that frequent phone interruptions can lower students' interest in schoolwork, especially when the work requires sustained focus. However, Nguyen et al. (2022) showed that when smartphone apps are

used for tracking goals or getting feedback, they can actually improve motivation. These contrasting results show just how much the outcome depends on how phones are being used.

Smartphone Effects on Teacher and Student Relationships

Smartphones have entered high school classrooms, and they are creating complications in the relationships formed through the experience of learning. They may only help the learning experience, if they are used properly, however, these devices are distractive to learning, which raises flags for educators. Zhang et al. (2022) found that problematic smartphone use affected students' subjective well-being negatively, but the relationship with the teacher moderated the influence. If both the student and the teacher have a strong and supportive relationship that is positive and qualitative, then a strong and supportive relationship exists. However, the use of smartphones also disrupts the strong and positive relationships that teachers are regularly trying to cultivate by being close or connecting with their students.

Self-Regulation

Self-regulation is a vital part of students' capacity to manage and complete tasks on time. Research shows that students with better self-control can overcome distractions, such as smartphone use while studying, better than students with less self-control, resulting in better performance (Hartley et al., 2020). This suggests that internal discipline mitigates the effects of digital distraction on learning performance compared to external distractions like digital devices. Similarly, students with lower self-regulation struggled to limit their smartphone use; thus, they put off completing assignments (Zhao et al., 2023). This infers that smartphone use could worsen students' issues with remaining engaged in their studies. Students need to develop self-regulation skills to overcome smartphone distraction challenges. In-service education that focuses on students becoming more self-aware and taught to manage their time could give students the ability to use a smartphone as a learning tool instead of a distraction (Hartley et al., 2020). It is important to consider in-class activities that cultivate metacognitive and behavioral self-regulation development with the use of technology.

Educational Environment

Research supports the efficacy of structured smartphone policies in enhancing the educational environment. A study by the Office of Superintendent of Public Instruction (2024) emphasizes that clear cell phone policies, when paired with strategies to support student mental health and digital citizenship, contribute to better learning outcomes and healthier school climates. Similarly, a survey conducted found that 90% of educators support policies restricting smartphone use during instructional time, citing concerns over distractions and the impact on student well-being (National Education Association 2024). These findings underscore the importance of thoughtful policy development and consistent enforcement in ensuring that smartphones serve as assets to the learning process rather than obstacles.

Classroom Management

To combat the negative effects of smartphone distractions, utilizing effective classroom management is necessary. In addition to exercises to ensure student engagement, having clear policies regarding smartphone usage - including specific timeframes when it is permitted, and an outright prohibition during instructional time - can eliminate distractions and maximize discipline (Ahmed et al., 2020). Clear guidelines assist students in establishing their external regulations and allow the students to move toward internal control of their attention and behaviors. Furthermore, teaching digital literacy within the curriculum can teach some students how to use their own devices responsibly and effectively (Hartley et al., 2020).

This explicitly teaches students how to evaluate when and how to use their smartphones in appropriate academic contexts, and to build a more responsible relationship with technology. How to create a collaborative environment between educators, students, and parents in a way to improve academic achievement rather than hinder it. Even though smartphones can be seen as a detrimental factor: open dialogue, and agreed actions, with implications, for example communicating phone policy, and utilizing smartphones, will facilitate a balance between technology adaptation and academic achievement (Ahmed et al., 2020). Some collaborative actions could usher in a sense of collective ownership while also providing options within a school culture that values digital citizenship.

Wang and Song (2024) found that overuse of phones in classroom can weaken these relationships by taking students out of the moment and reducing respect for teachers. On the flip side, Park and Lee (2021) discovered that when teachers use smartphones as tools for communication and collaboration, they strengthen connections with students. These examples suggest that the way smartphones shape relationships really depends on how they're introduced into the classroom.

Teacher-Student Dynamics

Smartphone use in classrooms disrupts teacher-student dynamics, challenging respect and authority while affecting academic performance and mental health. A 2023 study by the Institute of Education Sciences found that over 50% of public-school leaders reported negative impacts on students' academic outcomes due to cellphone use, with even greater effects on attention spans and mental health (Institute of Education Sciences, 2023). Similarly, a 2021 survey by the National Education Association showed that 90% of educators support policies restricting cellphone use during instructional time to reduce distractions and enhance student well-being (National Education Association, 2021). Smartphones can be distracting and may affect student to teacher relationships in a negative way, by the student respecting the smartphone more than the teacher.

Smartphone Effects on Student Academic Performance

Numerous studies have demonstrated that increased smartphone usage

is related to lower academic performance. For example, a meta-analysis of 63 studies across 28 different countries found a small but statistically significant negative relationship between smartphone use and academic performance for students (Kuş, 2025). This relationship indicates that more smartphone use might impair students' ability to complete academic tasks and are more likely to procrastinate completing their tasks. The use of a smartphone makes the situation even more difficult. Students engage in non-educational use of their smartphones - social media and gaming - during school hours and students report they use their smartphones for a significant part of their school day and engage in unrelated work on their smartphones (Giunchiglia et al., 2020). This may lead many students to be distracted from academic tasks and procrastinate, ultimately reducing their productivity.

Academic Games

Recently, the use of smartphones in high school classrooms has begun to take off, especially due to digital educational games. These mobile applications are used within lessons as part of the process to enhance student learning engagingly and interactively. One such meta-analysis by Tlili et al. (2024) indicated that educational mobile games had a highly positive effect on students' overall learning performance, with the largest increases in the puzzle games cohort. The levels of research improvement levels show that depending on students' learning and academic success can bring a lot of potential through mobile games as an educational tool. Additionally, digital educational games also affect students' motivation for learning positively. Li et al. (2024) observed that we see the effect of student engagement through educational games, where engagement acted as a mediator for a relationship between educational games with an effect of increased learning motivation. They also noted that the digital environment had a moderating relationship; the immersive digital environment positively mediated the effect of educational games on student motivation. These findings provided evidence that smartphone educational games were making the delivery of teaching and student learning experiences more engaging and motivating for students in high school was possible if these games were designed and implemented effectively.

Non-Academic

Smartphones are an omnipresent aspect of high school classrooms and research demonstrates their possible disruptive impacts on academic accomplishment. For example, Jackson et al. (2020) examined the bad habits of students who used their smartphones for non-academic purposes (e.g., social media, and gaming) and worked with two groups of high school students. Students using smartphones for non-academic purposes performed poorly on the tasks used to measure performance compared to those who did not use a non-academic smartphone device. Similarly, Amez and Baert (2020) conducted a meta-analysis to measure habitual smartphone use among college students and included a few high school students. One of the findings of this study indicated that the use of smartphones for non-academic purposes was associated

with dropping grades especially when students had the capability of activating their smartphones during class sessions. Notifications from smartphones also drew attention away from instruction as did the availability of instant communication.

As smartphones become embedded into students' daily lives, the issue of smartphones in classrooms will continue to develop. The cognitive burden from smartphone-related multitasking negatively affects academic success. Giunchiglia et al. (2021) demonstrated that high school students who frequently checked their phones during study time had lower comprehension and retention because their focus was broken by constant interruptions. Han and Yi (2022) also revealed that excessive smartphone use was associated with increased stress and diminished academic motivation, both of which decreased performance in courses demanding cognitive focus. Excessive multitasking also overloads cognitive resources thereby limiting the way to process and retain complex material.

Positive Impact

On the other hand, if structured properly, smartphones can have a positive impact on students' academic performance. For instance, Chen et al. (2023) showed that educational apps and online tools accessed through smartphones had a positive impact when used in lesson planning on student engagement and academic performance in STEM areas. In addition, Kumar and Sharma (2024) show that when smartphones are used with a teacher's guidance when conducting research, and collaborating with peers, smartphones encouraged critical thinking skills and retention of knowledge. However, to reap the benefits of smartphones in educational contexts, teachers need to put some systems in place to limit their misuse. When functions are not set, the use of phones usually turns into distraction and the educational part becomes secondary. Overall, smartphones can have both a positive and negative impact on students' academic performance in a high school classroom context, particularly with regard to their use. A distraction still exists in both studies without being considered as a smartphone-use context, which Jackson et al. (2020), and Amez and Baert (2020) found evidence suggesting a link between unrestricted access to smartphones, lower grades, and decreased attention.

Alternatively, Chen et al. (2023) and Kumar and Sharma(2024) found that learning was enhanced through educational tools and engagement with peers or participation with educational apps when having students using a smartphone in the support of a teacher. The dilemma becomes how policies support the best outcomes from academic learning with students using smartphones and how to reduce distraction within the populations of students. Policy solutions to enhance academic outcomes and engagement could be contributing factors to not just classroom policies on acceptable smartphone use in accordance with teacher supervision to eliminate distracting factors but to not support a broader exploration of banning smartphone use for learning purposes.

Test and Assignment Scores

Smartphones have a direct connection to the test and assignment scores of high school students, and that connection is mostly negative when what students do with their devices is wasted. Jackson et al. (2020) detail that students engaged in non-academic tasks, like examining social media, and playing games, while in a classroom and studying, are less focused, and therefore scored worse on tests and assignments, than those who did not engage with a device. The interruptions of messages that they were notified about, to have them look at their social media immediately, or to check an app one last time is obstructing students' abilities to focus on a higher level, and thus more challenging material, and hindering retention and comprehension. Amez & Baert (2020) conducted a meta-analysis and noted that frequent smartphone use is associated with poorer grades, particularly where the device has been recently used before, during, or during an assessment or task. The lack of limitations on mobile devices and no examination of these effects indicates that when students use a smartphone in an unrestricted form, academic tasks are directly interrupted, thus impacting negatively on their test tasks or assessments.

Garcia and Flores (2023) found that high phone use during class is linked to lower test scores and less progress in key subjects like reading and math. But not all findings are negative—Banerjee and Cho (2020) reported that students who used smartphones in structured, academic ways actually performed better on assessments. Again, the key takeaway is that outcomes depend on the purpose and structure behind smartphone use. By exploring motivation, relationships, and academic performance.

Singh and Patel (2021) believe that if educators plan carefully, smartphones can actually support students in becoming more independent and engaged learners. But Rivera and Zhang (2024) warn that when phone use is left unchecked, it can create more problems than it solves. These perspectives reinforce the idea that thoughtful, intentional smartphone use, supported by research and good teaching practices, is essential in today's classrooms.

Group Collaboration

Conversely, smartphones can provide opportunities for group collaboration with intentional placement in instructional tasks. Chen et al. (2023) identified that students showed more involvement in group work, with an emphasis on STEM, through educational apps and online tools accessed via smartphones that provided real-time shared resources and idea sharing. Occasionally this fostered increased discourse and problem-solving and ultimately improved their group's collective outcomes. Likewise, Kumar and Sharma (2024) found the use of smartphones directed by the teacher enabled group collaboration as students could do things like research a topic and co-edit documents online, which then caused the group to think critically and retain that knowledge better. However, this all depended on thoughtful guidance and the prevention of distracted off-task behavior. Organizations might consider engaging in distracted off-task behavior when using smartphones for modern purposes but when used effec-

tively there is potential for smartphones to offer a group collaboration opportunity where each student uses their device for group education.

Summary

Given that smartphones enable learners to engage more in personalized, collaborative learning and learning that is often more flexible. There are, in fact, risks and distractions to learners using smartphones for learning. The aligning of relationships between cognitive, educational, and attention span relationships is often described as the educational technological paradox (Selwyn & Aagaard, 2021) and is suggestive of technology's ability to enhance student learning and learning experiences, as well as the use of technology to distract students away from and misdirect attention from the academic task. Recent literature pointed to the need for intentional structures to mitigate unintentional off-task behaviors. For example, Hartley et al., (2020) found that the presence of a smartphone impeded whether students preferred off-task behaviors despite negatively impacting motivation and academic focus

Smartphones influence student motivation in opposite ways, depending on the context, leading the smartphone to either increase motivation and engagement or decrease motivation and engagement. Just having a smartphone, even turned off, takes up cognitive resources and attention. Skowronek, Feng, and Lee (2023) find that the presence of it has, at least in part, limited goal setting, self-regulation, and intrinsic motivation, all of which are needed to be academically successful. Hartley et al. (2020) explain that digital distractions challenge the self-regulation and attentional flexibility of adolescents, making it difficult for educators and students alike to keep their focus on the task at hand and to follow through with their intentions as they self-regulate. This challenge is very concerning for high school-aged youth, an important time of development in which to build a motivational framework or self-regulated learning behaviors because smartphones can undermine intrinsic and extrinsic motivation.

Intentionally used smartphones can increase motivation and peer interdependence. Low and Van Ryzin (2021) showed that collaborative learning activities using smartphones created academic growth, emotional regulation, and social connection through shared group experiences. Askara et al. (2024) found that using a mindfulness-based approach with students was a tactical way to engage students and produce metacognitive activity and intrinsic motivation. Overall, these findings suggest that structured and intentional use could turn smartphones into a tool for increased responsibility and collaboration! Educators must help students make intentional choices, reducing mindless scrolling and increasing purposeful academic stimulation.

Smartphones indirectly influence student-teacher dynamics and relationships, often making the classroom experience more difficult. Smart devices can frustrate the creation of strong, meaningful relationships teachers aim to build, as students choose devices over interpersonal relationships. Zhang et al. (2022), the negative impact of excessive and problematic smartphone use suggests reduced subjective well-being of students; however, the negative effects

were diminished with a positive teacher-student relationship. The example in the sphere of cell phone policy, the Office of Superintendent of Public Instruction (2024) suggests that "cell phone policies come with clear expectations for students when interacting with their smart device, they are also accompanied with specific plans to support mental health and digital citizenship, which, in turn, can improve student learning and improve the school climate" (p. 6). The policy can enhance good relationships and respect, provide authority to teachers, ignore distractions.

The constructs of self-regulation are critical when it comes to managing smartphone-based distractions so that the required work is completed promptly. Hartley et al. (2020) reported that students who felt they demonstrated self-control were able to deal with distractions in a more appropriate manner which assisted them in better performance compared to those students who did not feel as if they possessed good self-regulation/control. Likewise, Zhao et al. (2023) offered an account of the mixed messaging some students received concerning self-regulation that segued into procrastination of assignment completion even while the students recognized their smartphone distraction would potentially create more issues academically. In-service education that emphasizes metacognitive and behavioral self-regulation constructs, may help students re-frame the concept of smartphones from distraction to technology-enhanced learning concerning better tracking being on task.to an extent, and assist with a healthy classroom experience.

Chapter 3 will discuss the conclusions, practical and policy implications as well directions for future studies which will be beneficial to both students and teachers. Smartphone management and digital literacy are key in the success of teaching students to use these devices as tools and a learning enhancement.

Chapter 3: Implications
Introduction

Smartphones, when used habitually, can affect student motivation and, in turn, their success. There are a multitude of ways educators can facilitate proper use of smartphones when in the classroom, including classroom management strategies and educating students on digital literacy. Smartphones are unanimous in high school classrooms, offering both opportunities and challenges for education. These smartphone devices can enhance learning through educational apps, collaborative tools, and digital games, which increase student engagement with school and academic work (Chen et al., 2023; Tlili et al., 2024). However, unrestricted smartphone use often leads to distractions, as students engage in non-academic activities such as social media and gaming during instructional time, potentially undermining focus and academic progress. (Kuş, 2025; Giunchiglia et al., 2020; Wang & Song, 2024).

Significant concerns arise about the impact of smartphones in educational settings. Over half of public-school leaders report that smartphone use

negatively affects students' academic performance and mental health (Institute of Education Sciences, 2023). Additionally, nearly 90% of educators support mandatory restrictions on smartphone use during instructional time (adapted from National Education Association, 2021). These findings underscore the need to balance the educational potential of smartphones with the risks they pose to learning and student well-being. The purpose of this project is to explore the use of smartphones in high school classrooms by creating a baseline understanding of the possible impacts of smartphone use concerning high school students' cognitive engagement, academic performance and learning opportunities. Identifying strategies that educators and school systems can implement to facilitate smartphone use in ways that promote consistent engagement, self-directedness, and deep learning will enhance student learning ability (Chen et al., 2023; Tlili et al., 2024).

How, if at all, does the habitual use of a smartphone use in high school classrooms influence students' motivation and academic success? Highschool students are already used to multitasking, so if the teacher uses app like games the student will engage in a way they are already used to (Hartley et al., 2020). Apps that are connected to the class also build community and foster learning. In what ways can educators and school systems facilitate student engagement with smartphones use to ensure consistent engagement, self-directedness, and deep learning? The strategies must first include positive relationships between peers and the teacher, in order to use critical life skills and academic strategies to best support the high schooler (Twenge, 2023; Hinduja & Patchin, 2022). Many teachers use a variety educational games and collaborative apps to enhance student engagement and reach that deep level of understanding (Low & Van Ryzin, 2021). Students are connecting through a device outside of school hours, so if the educator can leverage some of their device use to connect with peers better, they will be able to learn better through s deeper level of understanding.

Conclusions

There are two main findings that include teachers having clear standards regarding smartphones and introducing digital literacy into the classroom. Having clear standards helps the students to feel like a team with the teacher, which allows for deeper understanding and a better learning environment. Digital literacy is a vital skill, as it is a part of people's daily lives, and teaching students how to use smartphones appropriately will be crucial in the student's success.

First, it is important to establish clear standards around smartphone use that clarify when and where these devices can be used in class. This allows the teacher to mitigate student distractions and promote self-discipline. Well-defined classroom management techniques, such as restricted zones or designated smartphone use times, can significantly decrease non-academic smartphone use, which is often linked with poorer academic performance as well as attention spans (Ahmed, R. R., Salman, F., & Malik, M. F., 2020). By defining boundaries that encourage students to control their impulses and

concentrate on their academic work, these clear rules help students in the development of self-regulation skills. Aagaard (2023), for example, noted that smartphones fragment attention, which can lead to cognitive distractions that affect comprehension and working memory.

This is balanced by clear standards that promote organized workplaces that restrict multitasking opportunities, which have been demonstrated to improve cognitive load (Giunchiglia, F., Zeni, M., & Gobbi, A., 2021). Academic achievement is greater for students with clear standards and boundaries. Clear standards minimize this through developing controlled environments which restrict possibilities for multitasking, which has been found to increase mental workload (Giunchiglia, F., Zeni, M., & Gobbi, A., 2021). Reenforcing these standards creates a sense of responsibility. Consistent technological constraints assist students accept classroom standards because they provide them with expected expectations that they are able to accept and comprehend the logic behind being asked to comply with a task, such putting a phone somewhere (Thomas, R., & Anderson, D., 2023).

As opposed to being held back due to their test boundaries, students who have clear boundaries are given opportunities such as asking students to leave their smartphones in a particular place during class. This may decrease the temptation (a) to text, (b) play games or (c) use social media, which can have an adverse impact on memory and comprehension (Flanigan, A. E., & Titsworth, S., 2020). When someone in the class does something such as putting away their smartphones, the student who is most susceptible to being influenced will not be because of peer pressure. These clear standards encourage self-discipline, which is consistent with the Executive Functions theory, which emphasizes the significance of attention management and inhibitory control for academic achievement (Diamond, A., 2013). These students' self-discipline will help them thrive academically both now and in the future achievement.

Second, one active way to teach students how to use smartphones properly in classrooms is to integrate digital literacy into the curriculum. In accordance with Hartley et al. (2020), digital literacy programs can help students oversee their academic and extracurricular pursuits by giving them the tools to critically evaluate how they use technology (Hartley, K., Harlow, J., Chidgey, R., & Visser, I., 2020). According to Lin et al. (2023), who discovered that multitasking with cellphones breaks down educational results and reduces focus, multi-tasking might include lessons on identifying the cognitive consequences of smartphone multitasking (Lin, Y., Zhang, Q., & Chen, H., 2023). Teaching students how to use smartphones as tools for learning, such as accessing educational apps or collaborating on projects is helpful.

Given that education promotes mindfulness in its use, digital literacy additionally helps people develop a healthy relationship with technology. According to Askara et al. (2024), mindfulness-based technology use can boost student engagement by encouraging deliberate and purposeful digital device engagements (Askara, M., Lim, J., & Tan, R., 2024). Decrease idle browsing

and encourage self-regulated learning, for instance, by guiding students to set specific goals for using their smartphones in class (such as utilizing a calculator app for math problems). Furthermore, Banerjee and Cho (2020) discovered that when students are taught to prioritize their education over social media or enjoyment, they are more likely to perform better academically. This happens because students who receive digital literacy training are able to use smartphones in a disciplined way.

Practice Implications

There are two practical implications that include utilizing smartphones in classrooms and integrating lesson plans with digital literacy. For example, smartphones can be helpful when they are used to learn, such as using a game to memorize key terms when the student is driving in the car. This can help the student to study without it being a chore.

First, utilize smartphones for interactive learning by integrating educational mobile games and collaborative applications, such as educational or STEM-based mobile games, into lesson plans. Teachers can, for example, use puzzle-based games, or group apps to collaborate in real-time and discover answers together as a group (Chen et al., 2023). In a science lesson, for example, a teacher might use a mobile game for students to simulate experiments or use a collaborative app for groups to work on a research project, having enough guidance in order to avoid off-task distractions.

Second, to accomplish this goal, integrate lessons in digital literacy designed to instruct students on how to make responsible choices regarding a smartphone. More importantly, this means teaching students about the appropriate 'when and how' to use a smartphone such as gaining access to an educational App. However, using a smartphone to conduct research is wasteful for academic purposes such as social media or gaming. (Hartley et al., 2020). Teachers can create activities that suggest students critically analyze online content, or the use of collaborative tools, ensuring students have useful structures that will aid their learning and keep them focused on their learning goal.

Policy Implications

Assembly Bill 272 authorizes school districts to set up policies that restrict student's cell phone use in schools (State Superintendent Thurmond Calls for Restrictions on Cell Phone Use in Schools, 2024). There are three recommended policies that may be adhered to or implemented at the local, district or state levels such as strict smartphone usage policies that are defined by academic use as well as free choice use. First, having the students store their smartphones in a secure location helps the students to not be tempted to use the device when they are not supposed to. Second, establish and share clear policies to prohibit student use of smartphones during instruction but allow limited and structured use at designated times (e.g., within specific activities or breaks). Third, policies should be developed collaboratively with teachers, students and parents to promote ownership and responsibility (Ahmed et al., 2020). For example, teachers could establish a "no cellphone" instructional pe-

riod where cellphones are stored in a designated area, allowing them to be used only for educational tasks such as research or app-based learning activities during class time. Similarly, an educational task would be an app to track weather patterns. Consequences of not following these classroom rules could also include bringing the smartphones back later after taking them away temporarily.

Directions for Future Study

Longitudinal studies are the first study for the future because it would allow more credible data to see the effects of long-term smartphone usage being controlled vs. unregulated smartphone use. The second future study would focus on teachers and to see the effects when teachers are trained on how to address smartphones in the classroom. The third study would center on diverse cultures and economic status to determine any negative effects on the academic success regarding smartphone usage.

First, conduct longitudinal studies to explore the long-term effects of organized smartphone integration such as (a) educational and collective apps, (b) impacts on academic achievements/engagement or (c) student-teacher relationships in high school classrooms. Longitudinal studies should follow different cohorts of students for multiple years of academic study and track changes to outcomes. Then compare classrooms with organized smartphone multimodality to those with unrestricted or banned use by using tests, retention, and motivation (Chen et al., 2023; Kumar & Sharma, 2024). This will help bridge the gap and help more students succeed.

Second, investigate the impact of professional development initiatives that prepare teachers to implement smartphones in their lessons effectively. Focus on investigations that examine how teachers are educated about strategies to manage smartphone distractions based on (a) lesson plans on educational games, (b) educational and productivity applications and (c) other collaborative applications which may affect student outcomes such as academic achievement and digital citizenship. Study the impact of teacher training on student outcomes, comparing the impact in similar controlled experimental studies in varied school populations (Hartley et al., 2020; Kumar & Sharma, 2024). Teachers will benefit from training and so will their students over time.

Third, explore what influence (a) socioeconomic status, (b) cultural attitudes and (c) access to technology have on the efficacy of smartphone policies and the impact within academic outcomes. The studies would include urban, rural and socio-economically diverse schools, allowing for the comparison between access to smartphones and digital literacy education, and the implications on student performance and/or engagement (Ahmed et al., 2020; Giunchiglia et al., 2021). Knowing how different areas are using technology will help everyone be on the same learning playing field.

Limitations

There are four limitations which include the (a) lack of long-term data, (b) limited teacher training, (c) policy enforcement is under researched and (d) diverse regions are content specific. The following limitations and are in need

of further research to fully understand. First, research is mostly cross-sectional and lacking long-term data (Jackson et al., 2020). Second, the findings are context-specific which limits generalizability across diverse regions (Kus, 2025). Third, limited exploration of teacher training impacts and mental health outcomes (Institute of Education Sciences, 2023). Fourth, variations in policy enforcement are underexplored therefore, hindering universal recommendations (Ahmed et al., 2020).

Summary

When looking at the role of habitual smartphone user behaviors on high school students' motivation to learn and academic performance, and how to maximize students' educational potential while minimizing distractions. Smartphones have become a part of the fabric of high school classrooms and provide various opportunities and challenges. Smartphones enhance learning in high school learnings by using the educational apps available, collaborating tools, digital games that improve engagement and provide opportunities for deeper learning (Chen et al., 2023; Tlili et al., 2024). However, when used without restrictions, smartphones can be distracting, for example from social media and gaming, which can detract from student focus and cognitive engagement resulting in lower academic performance (Kuş, 2025; Giunchiglia et al., 2020; Wang & Song, 2024). Providing understanding of the extent to which habitual smartphone use plays a role in determining cognitive engagement, academical performance, and engagement in productive learning opportunities while establishing effective strategies related to classroom management and digital literacy that facilitates responsive learner/student engagement, independent ownership of learning, and opportunities for deeper learning.

Exploring two central questions, one being how habitual smartphone use affects motivation and success in school for students, while the other how education could support responsible use of smartphones for educational purposes. The results focused on the need for clearly defined standards for smartphone use including the design of educational curriculum. considerations of scholarly standards of digital literacy defined broadening the scope of investing critical thinking of technology use as it relates to smartphones to support mindful and meaningful use of technology (Hartley et al., 2020; Askara et al., 2024). With the full expectations of educational use of phones spelled out, students are much more likely to stay focused on their schoolwork than would otherwise be true from many distractions associated with smartphone ownership (Chen et al., 2023; Banerjee & Cho, 2020). Other practical examples include intentional use of educational games, collaborative apps, and even teaching students to navigate their Venn diagrams to prioritize academic work over leisure.

The results have important notifications for educators, school systems, and policymakers. If standards for the use of smartphones are clearly established and maintained, educators can create controlled environments that limit multitasking, lessen cognitive load, and encourage academic success. By limiting use of smartphones based on establishing boundaries (storing smartphones in

designated areas during instructional time), educators can support self-regulation and create a collaborative environment of students and educators, and subsequently, deeper learning and a productive classroom (Thomas & Anderson, 2023). Additionally, by integrating digital literacy, students will not be 'playing' on their smartphones, rather using them as digital learning tools (i.e., use educational apps for education, and not scroll through social media) (Hartley et al., 2020; Lin et al., 2023) or collaborating on group projects. Therefore, these not only improve literal academic success as measured by indicators (i.e., academic performance, engagement, etc.) but also develop critical life skills such as digital citizenship and responsible use of technology, to prepare students for the future.

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