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Abstract

Growing enrollment in full-time, K-12 virtual public schools has pushed education leaders to reexamine the strengths and weaknesses of online learning through the lens of child development and adolescent needs. This quantitative study informs K-12 education stakeholders and policymakers at the high school level on decisions regarding online learning. Preexisting quantitative data was analyzed from a student survey of high school students in central Oklahoma. This study examined the relationship between students' sense of connectedness to the classroom community and other demographic factors, educational settings, and measures of academic performance. Results found that online students are less connected than their peers in a blended or face-to-face educational setting. Student characteristics of race and grade level did not produce significant differences in connectedness; however, nonbinary/third-gender students and students who preferred not to reveal their gender had significantly lower connectedness than their heterosexual and cisgender peers. Furthermore, attendance and grades were significant predictors of student connectedness. While student connectedness decreased as the number of days absent from school increased, student connectedness increased as course grades increased.

Keywords: online learning, connectedness, sense of classroom community, high school online courses, distance learning, asynchronous online learning, classroom community scale, virtual schooling, K-12 online learning

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Chapter 1: Introduction

Virtual schooling has proliferated in the US over the last decade (Gemin et al., 2017). Once viewed as a technology used for remedial or advancement purposes, it has become the primary school environment for millions of students (Molnar et al., 2021). As educational leaders pursue virtual delivery systems, either out of necessity, as was the case with COVID-19, or to expand choice and access, it is essential to identify effective frameworks and practices for engaging students in meaningful learning.

The COVID-19 pandemic pushed virtual schooling to the forefront of the national educational landscape as circumstances forced many students to try online learning for the first time (Molnar et al., 2021). Almost overnight, teachers were forced to implement emergency remote instructional practices that pushed teachers out of their comfort zones and disrupted many traditional teaching practices (Kaden, 2020). Teachers became dependent on technology and often had to lean on students whose technological expertise often exceeded their own (Cutri et al., 2020; Kaden, 2020). Because online teaching and learning were new to many K-12 teachers and students, the unplanned disruption catalyzed rethinking and reinventing online lesson preparation, causing what Darling-Hammon (2020) argues is a remarkable paradigm shift in the nature of schooling.

Although COVID-19 changed the trajectory of online learning, virtual learning platforms were already expanding and developing in high schools across the United States before the pandemic. The National Education Policy Center (NEPC) reports increasing enrollment in full-time, K-12 virtual public schools for over a decade (Molnar et al., 2021). Meanwhile, the heterogeneity of virtual education programs and the vast array of platforms have blurred the comparison lines for high school online learning programs (Saba, 2013).

Over the years, many terms have been used to describe instruction delivered primarily through the Internet. In a literature review of journal articles published between 1988 and 2018, Singh and Thurman (2019) identified 19 unique terms to define online learning. The most common terms are online learning (15 articles), e-learning (11 articles), blended learning (18 articles), and online education (6 articles). Saba (2013) argues that confusing terminology has become a barrier to aligning prior research in online education. The lack of continuity in terms makes it difficult to situate research within the field's conceptual history and evolution (Molnar et al., 2021).

The numerous different entities operating virtual learning platforms are an additional challenge. The umbrella of K-12 online virtual public schools consists of district-operated programs, charter-operated programs, and programs managed by nonprofit Education Management Organizations (EMOs) and for-profit EMOs. These entities offer unique benefits and distinctions but ultimately compete for the same resources - students. Online learning is relatively new, and there is much to learn about this educational opportunity. The Internet has only been widely used for around 25 years, and the oldest K-12 online education programs are between 15 and 20 years old (Gemin et al., 2017).

In Oklahoma, charter-operated virtual schools are full-time accredited public schools that are allowed greater flexibility with some state guidelines than some district-operated virtual schools. For example, charter schools are not required to adhere to the State of Oklahoma's Teacher and Leader Effectiveness Standards. This means they may have teachers teaching outside their areas of certification. Charter-operated virtual schools maintain their own governance board and are held accountable to their authorizer and leadership board. They have increased flexibility with schedules and may graduate students early once graduation

requirements have been fulfilled. While they have flexibility in some areas, charter schools are held to the same financial reporting requirements as district-operated schools. According to Oklahoma Statute 70 OK Stat § 70-3-145.3 (2021), “A virtual charter school shall be subject to the same reporting requirements, financial audits, audit procedures, and audit requirements as a school district.” Table 1 lists comparisons between Oklahoma charter-operated virtual schools and district-operated virtual schools.

Table 1

Oklahoma Charter-operated Virtual Schools vs. District-operated Virtual Schools

Charter-operated Virtual Schools	Both	District-operated Virtual Schools
• Are operated by individuals and organizations outside the school district - nonprofit and for-profit EMOs • Have a great deal of freedom with school schedules and curriculum • Overseen by the state-wide virtual charter board • May have certified teachers teaching outside their areas of certification • May allow a student to graduate early with the minimum state graduation requirements	• Free • Open to all students • Receive state and federal funding • Accountable to the Oklahoma State Department of Education • Compliant with all federal and state laws • Meet the minimum state graduation requirements	• Are operated by the school district • Align practices with district policies • Must follow all state education requirements concerning school schedules and curriculum • Must adhere to similar accreditation processes to traditional programs • Overseen by the local school board • Have certified teachers in each subject area in which a student is enrolled • Require students to complete the district graduation requirements - often above the state minimum

As of the 2023-2024 school year, Oklahoma had six virtual charter schools authorized by

the Statewide Virtual Charter School Board: Dove Virtual Academy, Epic Charter School, E-School Virtual Charter Academy, Insight School of Oklahoma, Oklahoma Connections Academy, and Oklahoma Virtual Charter Academy (<https://svcsb.ok.gov/>). These schools are full-time public education options that draw students from across the state and deliver instruction online. Epic Charter School, E-School Virtual Charter Academy, Oklahoma Connections Academy, and Oklahoma Virtual Charter Academy (contracts with K12 Inc.) are managed by for-profit education management organizations (EMOs). Meanwhile, non-profit education management organizations manage the other two charter schools.

A district-operated virtual program must declare with the Oklahoma State Department of Education whether it will operate as a regulated or deregulated program. A deregulated program would enjoy the same benefits as a charter-operated school while continuing to be maintained and overseen by their local board of education. Alternatively, a regulated program would be required to adhere to all the same rules and guidelines as a traditional school. In a regulated program, students can participate in blended learning opportunities, attend in-person classes, and take some classes online. Online students in a regulated program can participate in Oklahoma Secondary School Activities Association (OSSAA) sponsored activities, such as varsity sports, band, or choir, by attending at least one class period per day on campus. According to Oklahoma school transfer laws, a district-operated virtual school can only offer services to students who live inside the district boundaries or transfer into the school district.

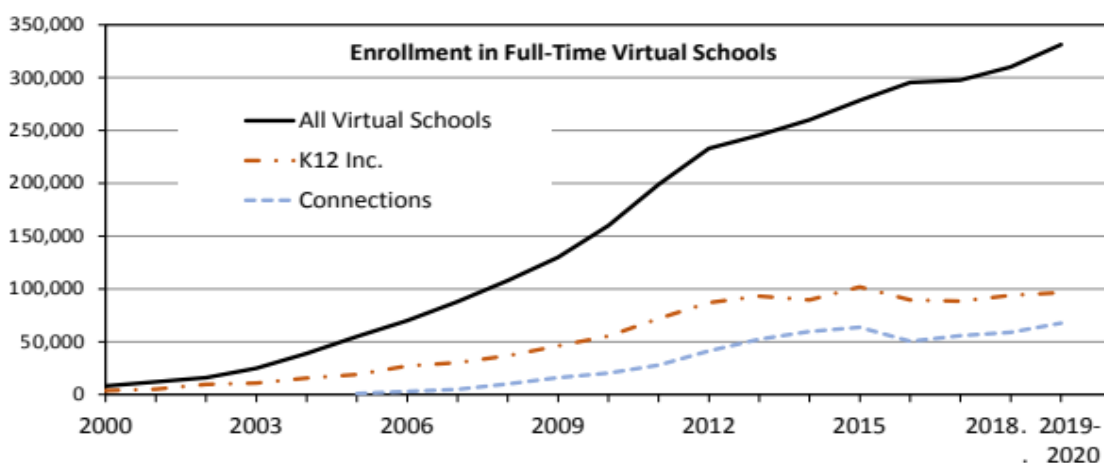
In 2019-2020, 477 full-time publicly funded K-12 virtual schools in 40 states enrolled more than 332,000 students nationwide (Molnar et al., 2021). District schools in 2019-2020 accounted for just over half of all virtual schools, but their share of enrollments was only 24.2%, while charters accounted for 75.8% of total enrollment (Molnar et al., 2021, p. 19). One possible

explanation for this discrepancy is that district schools typically serve smaller populations of residents within their district boundaries, while virtual charter schools often draw from statewide markets. Another possible explanation is that for-profit companies prioritize substantial numbers of students per school to maximize profit.

Figure 1 illustrates the enrollment trends in full-time virtual schools in the United States over the last two decades (DePasquale, 2016). It also illustrates the proportion of students in schools operated by the two largest for-profit Education Management Organizations (EMOs), K12 Inc. and Connections Education.

Figure 1

Estimated Enrollment Trends in Full-Time Virtual Schools



Gulosino & Miron, 2017, p.11

Consistent with broader research in the field, reports completed by the National Education Policy Center over the past decade have repeatedly found that students in virtual schools “generally underperform their brick-and-mortar counterparts” (Molnar et al., 2021, p.43). In the 2019-2020 school year, on-time graduation rates of 54.6% in virtual schools and 64% in blended schools fell far short of the overall national graduation rate of 85%. However, district-operated virtual schools are outperforming charter schools. District-operated schools

achieved state school performance ratings (50.7% acceptable) compared to charter-operated schools (35.2% acceptable) (Molnar et al., 2021, p. 5). District-operated schools also reported a 9.6% higher graduation rate than charter schools (Molnar et al., 2021, p. 12). It is important to note that as we emerge from the pandemic, we may experience a notable shift in data. As the scope of students involved in virtual learning continues to broaden and the number of district-operated virtual programs increases, it will be interesting to see if the data reflect parallel changes.

Before emergency remote instruction due to COVID-19, online education at the K-12 level was generally untested on a large scale. Prior to the pandemic, the best estimates were that only 5% to 8% of all K-12 students engaged in online learning (Barbour, 2021). Due to the widespread exposure during emergency remote learning, many adolescent students have begun to embrace online learning as a viable choice for their education. Now that schools have returned to offering in-person classes, online learning has remained a choice for many students and expanded the profile of an online student to include greater diversity and students outside the original population (Arnett, 2021; Barbour, 2021). Between 2023 and 2028, the United States K-12 online learning industry is expected to have a compound annual growth rate of at least 8.3% (Shah, 2023). The global growth rate for online learning is between 10% and 15% (Shah, 2023). Consequently, we are several years away from data to help us gauge the full impact of the increase in district-operated virtual schools and the shift in online student diversity on the educational landscape.

As district-operated virtual programs become ubiquitous, school leaders seek up-to-date guidance to increase online program student participation, attendance, retention, and learning outcomes. Experts are examining ways to support equitable and effective teaching and learning

regardless of the medium through which that learning occurs (Darling-Hammond, 2020). Many of the same best practices for online learning parallel those in traditional learning environments (Kebritchi et al., 2017; Picciano, 2017). Students enrolled in online courses need a daily schedule, opportunities to engage with their teacher, and opportunities to engage peer-to-peer (Dorn et al., 2020). Meanwhile, online learning highlights the student-centered focus of constructivist learning and contains a unique set of best practices. Shah (2019) predicts that student-centered learning will continue gaining popularity in offline and online educational settings. Education leaders understand that for virtual programs to gain educational legitimacy, change strategies must be highly focused and more than skin-deep, quick fixes (Rowland & Pivcevic, 2022).

Moreover, the large-scale virtual learning experience caused by the COVID-19 pandemic uncovered and emphasized some potential social, emotional, and developmental issues for students not meeting in person with peers and teachers daily (Carver, 2020). Not only did virtual learning highlight students previously marginalized in the traditional education system, but it also highlighted a need to research how virtual classrooms impact child development (Arnett, 2021). For example, the lack of daily social interaction between learners may cause students to experience feelings of isolation (Graff, 2003). Additionally, K-12 students participating in a full-time schedule of asynchronous online classes may experience a loss of interpersonal relationships and a reduction in face-to-face communication skills (Arnett, 2021), resulting in a loss of connectedness and a sense of community during their adolescent years.

Student Performance in Virtual Schools and Online Courses

Virtual schooling provides a unique learning opportunity for some students to receive academic services in an otherwise unavailable, least restrictive environment. Virtual classrooms

can provide students with challenging academic rigor and empower them to look beyond the boundaries of their local teacher, school, and community to answer questions and explore the world around them. Online learning can put students in the driver's seat of their educational journey and empower them to participate in classroom activities and learning experiences actively (Edwards, 2017; Heafner et al., 2015; Thomson, 2011). Additionally, students in asynchronous courses can engage in online studies without regard to geographical location or time of day (Gilbert, 2015; Singh & Thurman, 2019). Students can work on class materials outside of time constraints and use technology to communicate with their classmates in ways that are impossible in traditional in-person classes (Derakhshandeh & Esmaili, 2020). Online courses have the potential to create flexible learning opportunities for individuals who previously faced unsurmountable barriers to education, such as hospitalization, long-term health issues, being behind on credits, or moving from another state. Furthermore, English language learners can use online curricula to access course materials in their native language or use a combination of languages to increase the accessibility of learning materials (Castelo, 2020).

Hanson et al. (1997) found that students most successful at distance learning are intrinsically motivated and possess an internal locus of control. Self-regulation, time management, and motivation are critical factors for online students' success (Matuga, 2009; You & Kang, 2014). Students have also commented that online learning freed them from issues such as parking, traffic, wasted time, and other scheduling issues during the school day (Kirtman, 2009; Thomson, 2010).

When considering specialized learning opportunities for high school students, online courses can provide advanced or specialized course offerings that would otherwise be unavailable (Patrick & Jones, 2019; Picciano et al., 2009). Specialized courses can be offered to

a small number of students through an online learning platform, which might not be possible in a traditional classroom setting with a limited number of teachers and class size concerns (Gemin et al., 2017). According to Patrick and Jones (2019), 80% of K-12 school districts cited “the course was otherwise unavailable” as the number one reason for offering courses at a distance (p. 2). In a 2009 report by Picciano et al., K-12 school district administrators also cited offering Advanced Placement or college-level courses as another valid reason to make online course opportunities available to high school students. “Virtual schools and online programs provide a range of courses such as science, math, foreign languages, electives and remedial courses with highly qualified teachers” (Patrick & Jones, 2019, p. 5). In recent years, a shortage of qualified teachers has caused some school administrators to expand online teaching to ensure certified educators oversee all the courses in their schools (Willermark & Islind, 2022).

Students can be academically successful in a virtual schooling environment. As district-operated virtual programs expand, school leaders seek up-to-date guidance to increase online program student participation, attendance, retention, and learning outcomes. Best practices for online learning demonstrate many benefits this type of learning can provide some students (Kebritchi et al., 2017; Picciano, 2017; Dorn, 2020). When teachers embrace the unique benefits provided by virtual schooling, they can reach students that a traditional environment might not be able to reach (Arghode et al., 2017).

Furthermore, a study by Lisa Kirtman in 2009 found similar learning outcomes for students studying in a traditional or an online class. Kirtman (2009) found that the difference in student learning outcomes between traditional classes and online classes appeared to have more to do with teachers adjusting classroom practices to online learning “as opposed to being an indication that online classes are somehow inferior” (p.112). Most students stated that the

classroom setting made no real difference in their learning ability. However, students did acknowledge a difference in their peer interactions and interactions with their instructor. Students realized they needed to ask the instructor more questions and take responsibility and ownership of learning the course material. Students in this study pointed out that an added benefit of online learning included reviewing course material more than once and receiving one-on-one attention from the instructor when they asked questions. The students' suggestions for improving learning were to "increase small group and large group class discussions" (Kirtman, 2009, p. 110). Many researchers have demonstrated that with some intentionality from course designers and instructors, online classes can produce learning outcomes in line with traditional classes (Kebritchi et al., 2017; Kirtman, 2009). Furthermore, Rovai (2003) found that online course design and the educational pedagogy employed by online faculty strongly influenced student satisfaction and perception of quality online courses.

While online learning may only be ideal for some students, it has proven to be a valuable tool for many high school students. Unfortunately, online learning carries a stigma of being lower quality than face-to-face learning despite research showing otherwise (Hodges et al., 2020). Online classes may utilize different communication methods and components of instructional design; however, the learning environment only partially changes the rudimentary basics of how students learn. The elements of a quality classroom are similar in face-to-face and online classrooms. The 2017 study by Kebritchi, Lipschuetz, and Santiago identified similar best practices for instruction in both online and face-to-face courses. Those best practices included peer-to-peer interaction, active student engagement in learning, and emphasis on practice and student effort. The curriculum should be personalized to the individual student, contain a variety of learning options, and emphasize higher thought practices. Most importantly,

students need to feel connected to their classroom. Marzano and Marzano (2003) claim that student-teacher relationships are the foundation of all class activities in any learning environment.

Virtual schools have been described as a cost-effective way to provide services to students due to the lack of expenses related to transportation, building costs such as electricity, water, heating and cooling, and overall maintenance of physical facilities (Binkley & Fassett, 2021). Amid a nationwide teacher shortage and rising costs due to inflation, school leaders may be tempted to rely on virtual coursework to meet expanding needs (Willermark & Island, 2022). Meanwhile, a 2018 research study by Taylor and McNair found that organizational structures that work best for traditional organizations also work best for virtual schools. More specifically, districts cannot take shortcuts or invest less money in virtual programs if they want them to be successful. The organizational structures and learning emphasis that would create success in any school are equally necessary and vital in virtual programs (Keeton, 2004; Taylor & McNair, 2018). Furthermore, as class sizes increase, studies have shown a negative correlation between class sizes and both student satisfaction and instructor performance (Sorensen, 2015; Steele et al., 2019).

The Importance of Connectedness to a Community for Adolescent Development

According to the Centers for Disease Control and Prevention (CDC) website, school connection is when students feel that adults and peers care about their learning and them as individuals. During adolescence, school connectedness is a known protective factor for mental health, violence, sexual behavior, and substance abuse during the adolescent years. (Sieving et al., 2017). Steiner et al. (2019) reported that school connectedness has long-lasting effects on positive health and well-being into adulthood.

A strong sense of connectedness to a classroom community is also essential to engaged learning (Arslan, 2018; Hehir et al., 2021). In an online learning environment, students with high levels of sense of classroom community do not feel as isolated, are highly committed to learning, and experience high levels of academic achievement. (Rovai & Jordan, 2004). Connectedness to a classroom community has been associated with reducing the student dropout rate (Ahmady et al., 2018), increasing academic achievement (Pittman & Richmond, 2008; Arnesen et al., (2018), and increasing motivation to complete classroom assignments (Keyes, 2019). Students who feel disconnected from the community are less likely to contribute and likely to learn less from the course (Beise & Wynekoop, 2001).

Connectedness is often closely interrelated to belonging, relationships, and mattering. Goodenow and Grady (1993) defined school belonging as students' acceptance as individuals in the school's social environment and getting respect and support from other students. Elliot et al. (2004) defines mattering as a perception that we are a significant part of the world around us and would be missed if we were gone. School connectedness means that students feel like meaningful, influential, and valued members of the school community (Arslan, 2018). "If you feel you belong, loyalty follows, and with that, the permission for risk-taking and innovation" (Rowland & Pivcevic, 2022).

A 2019 study by Tasha Keyes found that teachers play the most crucial role in developing students' sense of classroom connectedness and engagement. Specifically, two teacher actions had the most significant impact on connectedness: "(1) fostering relationships with and between students and (2) employing teaching practices that encouraged students to participate in the work for the class" (Keyes, 2019, p. 171). Teachers who accomplished these two critical actions built teacher-student trust through authentic two-way communication,

providing engaging and relevant lessons and learning activities, and solid and consistent classroom management practices (Keyes, 2019). Furthermore, teachers who demonstrated high levels of caring and consistency reported stronger bonds in the classroom (Booker, 2021).

Topic, Problem, and Purpose

This study focuses on a full-time, district-operated, asynchronous online learning program where 9th-12th grade students receive curriculum and instruction via the Internet and electronic communication, and students engage with instructors and fellow students at a time of their convenience and in different physical locations. The study examines the relationship between students' reported connectedness to the classroom community and differences in classroom connectedness by educational setting, demographics, academic performance, and course attendance.

Problem

The proliferating growth of online learning for K-12 students has caused education stakeholders to recognize the need to expand online learning opportunities to meet the diverse needs of their learning communities (Gemin et al., 2017). Meanwhile, district leaders are also concerned with leveraging high-quality online learning opportunities that utilize research-based instructional practices and sound educational pedagogy (Arghobe et al., 2017). Furthermore, much of what we know about online education centers around colleges and universities or for-profit charter schools, creating a gap in the literature and research concerning K-12 district-operated virtual schools (Allen & Seaman, 2017; Arslan, 2021; Beise & Wynekoop, 2001; Berry, 2019; Black et al., 2008; Britt, 2015). The guidance available to public school leaders and policymakers must be revised to ensure that K-12 virtual students receive a high-quality education.

Research on K-12 online learning continues to increase, but this research has not generated substantive knowledge on high school students' sense of connectedness in an online class. Evidence regarding online learning has found that students report a lack of sense of community in their online courses as one of the critical reasons for their lack of connectedness (Jamison & Bolliger, 2020). In a study by Arslan (2021), students described feelings of loneliness, isolation, and disconnection from their peers and schools during distance learning. Within the school context, the need for belonging and connectedness are basic and fundamental human needs (Allen et al., 2016; Maslow, 1987). Additionally, research on school connectedness has found that feeling connected increases the likelihood of health and well-being (Arslan, 2021; Pittman & Richmond, 2008; Sieving et al., 2017). Connectedness is a protective barrier against feelings of isolation, loneliness (Hehir et al., 2021), stressors, and adversities (Zhang & Lin, 2020). Boardman et al., 2021 reported a correlation between connectedness, positive student performance outcomes, and motivation to complete course assignments.

Research on connectedness in high school online courses remains scant, leading to the knowledge gap this study seeks to address. By exploring students' self-reported connectedness in online courses at a district-operated virtual school in central Oklahoma, this research strives to inform educational leaders and shape future online learning practices. The district where this study occurred is in central Oklahoma and has offered students full-time and blended learning opportunities for four years.

Purpose

Given the need for knowledge on student connectedness in an online class, the purpose of this proposed study was two-fold. First, to examine students' reported sense of connectedness and learning in a classroom community. Classroom community, as conceptualized and measured

with the Classroom Community Scale (Rovai, 2002b), consists of two subscales: connectedness and learning. These subscales encompass McMillan and Chavis' four dimensions of connection to a classroom community: spirit, trust, interaction, and learning. The intent was to describe how high school students in online courses experience a sense of connectedness, learning, and classroom community. Additionally, differences in the dimensions can be compared to student characteristics. The second purpose was to analyze the relationship between students' reported sense of connectedness, learning, and community and their course attendance and academic performance.

Research Questions

The study addressed the following research questions:

1. What degree of connectedness to classroom community do students report in the three different educational settings?
2. Are there differences in student-reported connectedness based on student characteristics and educational setting?
3. Is there a relationship between student-reported connectedness and the number of days students are absent from school?
4. Is there a relationship between student-reported connectedness and performance in their courses?

Definition of Terms

The following terminology is pivotal to research regarding online education, and these definitions will orient this study to the more prominent field of high school virtual programs.

Distance Learning

Distance learning occurs when students and instructors do not share the same physical location. Distance learning may be conducted by correspondence or by electronic communication. Distance learning conducted by electronic communication is commonly administered over the Internet or by radio or television broadcast (Allen & Seaman, 2017; Gilbert, 2015; Park & Shea, 2020).

Face-to-face or traditional courses

Face-to-face or traditional courses are courses in which teachers and students share the same physical location, and course content is taught in person by an instructor to a group of students (Hornbeck et al., 2019).

E-learning

E-learning, also called online or electronic learning, is learning delivered through various electronic media and digital resources. Electronic media might include resources such as computers, the Internet, audio, video, and webinars (Patrick & Jones, 2019).

Online Learning

Online learning is any instructional practice or program that allows students to access course materials outside the physical confines of a classroom using the Internet (Patrick & Jones, 2019; Singh & Thurman, 2019). The use of this term is broad and may encompass a wide range of practices, including full-time online learning, blended or hybrid learning (a combination of online and face-to-face learning), and asynchronous or synchronous learning through a Content Management System (CMS) or a Learning Management System (LMS) (Krause & Goering, 2021; Mahmood, 2021; Moore et al., 2021; Cutri et al., 2020; Northcote et al., 2019; Peacock & Cowan, 2019; Steele et al., 2019; Watson et al., 2017; Whiteside, 2015; Johnson & Aragon, 2003).

Asynchronous Learning

Asynchronous learning occurs when students learn on their own time schedule from instruction that occurs in a different location and at a different time. Students can progress toward academic outcomes with a learner-centered curriculum and instruction. Asynchronous instruction is usually delivered through prerecorded video lessons or on a learning platform such as a content management system (CMS) or learning management system (LMS). Communication occurs primarily through electronic means such as online learning platforms, email communications, discussion boards, and cloud-based collaborative documents (such as Google Docs) (Keeya, 2020; Zhao, 2021; Simmons, 2022).

Synchronous Learning:

Synchronous learning occurs in real-time, often through videoconferencing software, allowing instructors to teach students simultaneously from different locations (Keeya, 2020; Zhao, 2021). Most K-12 schools use Zoom or Google Meet to conduct synchronous learning sessions.

Blended Learning

There are multiple definitions of blended learning, most of which include a combination of online learning and traditional face-to-face learning. However, many resources interchange the definitions of blended learning and hybrid learning or fail to distinguish between the two terms by using them synonymously (Steele et al., 2019). For this study, blended learning will be defined as students taking one or more classes online while simultaneously enrolling in one or more traditional classes in a brick-and-mortar school. Students may take some online classes to recover credits, take a course that is not available in the traditional schedule, or take advanced classes while also taking some classes in person.

Hybrid Learning

Much like blended learning, hybrid learning has multiple definitions, including a combination of online and traditional face-to-face learning (Steele et al., 2019). This study will define hybrid learning as integrating digital tools and online resources within a traditional classroom setting. Hybrid learning might include a student joining an in-person class virtually from a remote location while other students are simultaneously attending the same class in person. By this definition, hybrid learning could also be linked to a flipped classroom model. In the flipped classroom model, students are provided access to videos, reading, and other course materials to work through before attending an in-person classroom session. The in-person time is focused on applying concepts or working through questions. Teachers may use various digital tools and resources in hybrid learning, such as Google G Suite for Education, other software applications, or interactive whiteboards to combine the flexibility and benefits of online learning within a traditional classroom setting.

Content Management System (CMS)

A Content Management System (CMS) is a web-based software platform that provides a digital curriculum in a flexible learning environment. CMS software is typically provided through cloud-based services and can be open-source or proprietary (Heslop, 2018). This study will refer to content management systems as courses prepackaged by vendors to provide holistic services to school districts. Access may include using a CMS such as Edgenuity Courseware, Edmentum Courseware, Apex, or other software applications that provide and deliver digital content.

Learning Management System (LMS)

A Learning Management System (LMS) is a software platform where teachers can create, organize, and deliver digital educational resources to students. An LMS is often called a learning platform as it provides a central location to house lessons, videos, assignments, grades, and all pertinent classroom materials. Common LMS platforms include Blackboard, Canvas, Google Classroom, and Schoology (Simmons, 2022).

Emergency Remote Learning

Emergency remote learning is a temporary shift of instructional delivery to an alternate mode due to crisis circumstances (Hodges et al., 2020). A recent example of emergency remote learning occurred during the spring of 2020 when the entire population was required to stay in place and stay home due to the COVID-19 pandemic. The online learning that occurred during the 2020 and 2021 school years is often called emergency remote learning. This overnight shift to online learning forced teachers and students to attempt an unfamiliar and unprecedented learning experience they did not willingly choose. Emergency remote learning uncovered some unique student challenges, including students needing more Internet-accessible devices and high-speed Internet. In addition, teacher challenges included a need for more educational resources and training in online lesson delivery. Emergency remote learning should be distinct from online learning that occurs with trained teachers and a voluntary population of students.

Summary

The proliferating growth of online learning for K-12 students has caused education stakeholders to recognize the need to expand online learning opportunities to meet the diverse needs of their learning communities (Gemin & Pape, 2017). Meanwhile, district leaders are also concerned with leveraging high-quality online learning opportunities that utilize research-based instructional practices and sound educational pedagogy (Arghobe et al., 2017). Providing

equitable and inclusive access to online learning is a driver in the decision-making process for leaders; however, many additional nuanced factors may have a more profound impact on student success.

Education stakeholders and policymakers can strengthen the online learning environments where high school students are placed by examining the relationship connectedness in a classroom community. We can use our experience from emergency remote learning to propel online learning processes forward as we identify the instructional practices that positively impact student learning in the virtual classroom.

Organization of the Study

The research study is divided into five chapters. Chapter 1 includes an introduction, a statement of the problem, a statement of the purpose, definitions of terms, and an organization of the study. Chapter 2 provides an overview of the literature on the myriad issues surrounding virtual education in the K-12 setting. This chapter also includes the conceptual framework for the study. Chapter 3 outlines the methods used to address the research questions in the study. Chapter 4 analyzes the data and presents the study findings. Chapter 5 discusses the conclusions and implications of the study.

Chapter 2: Literature Review

This study contributes to over two decades of research on asynchronous online learning and its relationship to students' sense of connectedness and classroom community. While this study focuses on K-12 online education, the literature review pulls from traditional K-12 classrooms, K-12 online classrooms, higher education, and adult education research. Chapter 2 will primarily focus on online instruction and the conceptual framework of connectedness and classroom community.

The first section will outline a brief history of the development of distance learning in the United States. This part of the study will attempt to clarify the various terms associated with online learning and the wide variety of delivery methods, starting with distance learning and e-learning at the collegiate level before the Internet, followed by the evolution of online learning in the last two decades. Emergency remote learning due to the COVID-19 pandemic was essential in propelling K-12 online education options and highlighting the need to study K-12 online learning opportunities moving forward. Subsequent sections focus on differences between online learning and face-to-face learning, the weaknesses of online instruction, and best practices for providing online instruction and training for teachers in the future. The closing section defines connectedness and classroom community as the conceptual framework for the study.

History of Online Education

There was a need for distance learning long before technology existed to provide online learning. Growth of distance learning from the 1800s to present day has coincided with technological innovations. Correspondence courses flourished with the development of the United States Postal Service in the mid-19th century. In 1852, the Pitman Shorthand training program allowed secretaries to mail their work in to complete courses to attain a certificate of

expertise in shorthand (Sleator, 2010). In 1873, a correspondence program called the “Society to Encourage Home Studies” was established in Boston, Massachusetts (Caruth & Caruth, 2013). The founder, Anna Eliot Ticknor, established a network of women teaching other women by mail (Bergmann, 2001). This program, also called the “silent university,” enrolled more than seven thousand women and paved the way for other universities to provide distance learning through correspondence courses (Caruth & Caruth, 2013). This groundbreaking concept was initially developed to allow wealthy women throughout the country to experience higher education (Bergmann, 2001). It eventually sparked an educational revolution that provided universities access to an infinite number of potential new students (Caruth & Caruth, 2013).

Building on the concept of distance learning, the University of Nebraska established the University of Nebraska High School (UNHS) in 1929. It provided paper lessons through correspondence courses delivered through the U.S. Postal Service (German, 2020). Former UNHS students have included celebrities like Brittany Spears and Justin Timberlake, young Olympians like Michelle Kwan, teens living on isolated farms, students studying overseas with corporate or diplomat parents, and students of missionary families working in off-grid villages. The asynchronous course design and flexible learning schedule assisted high school students with overcoming barriers created by traditional learning environments (German, 2020).

As radio and television technologies evolved, distance learning options evolved alongside them. Live educational radio shows revolutionized educational programming by allowing students to hear their instructor. In 1953, the University of Houston offered the first televised distance learning classes broadcast through America’s first public television network, KUHT (The history of online schooling, 2022). The televised college classes aired in the evening so learners who worked during the day could watch at night (Keeya, 2020).

As computer technology developed, E-learning or electronic learning began in 1959 at the University of Illinois at Urbana-Champaign when Daniel Alpert and Don Bitzer launched PLATO - an acronym for Programmed Logic for Automatic Teaching Operations (Etherington, 2017). The men set out to create hardware to deliver various courses, support student learning needs, and meet teachers' needs through a computer program. The men reached their goals, and by 1965, learners could access hours of curricular materials from one of several thousand campus student terminals networked to a centralized hub (Etherington, 2017). However, it would be another few decades before network communications technology expanded, allowing e-Learning to continue expanding.

When the Internet launched in 1983, computer networks began to communicate, and by 1984 the first-ever completely Internet-based course was offered by the University of Toronto (Sarkar, 2020). Five years later, the University of Phoenix became the first educational institution in the world to offer both bachelor's and master's degrees entirely online (Sarkar, 2020). Online learning is a term that was first used in 1995 when the web-based system WebCT was developed as the first Learning Management System (LMS), which later became Blackboard (Singh & Thurman, 2019).

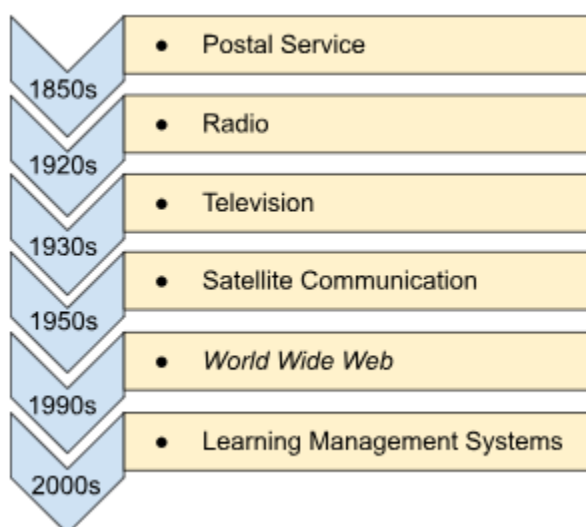
According to Simmons (2022), the first K-12 virtual school in the United States was launched in 1995; the Cyberschool Project in Eugene, Oregon, offered supplemental online high school courses. In 1997, the Florida State Legislature passed groundbreaking legislation establishing Florida Virtual School (FLVS), pioneering Florida's first Internet-based public high school. Other states, like Michigan in 1999, Idaho in 2002, and Georgia in 2005, followed suit, creating statewide virtual schools. Meanwhile, companies like K-12, Inc. in 1999 and

Connections Academy, run by Pearson in 2001, launched their own online schools. These for-profit schools used a business model to provide an online curriculum to homeschooling families.

In the early 2000s, technological advances made web-based content management systems possible (Heslop, 2018). These innovations paved the way for companies like Edgenuity, Edmentum, and Apex to provide online web-based software curriculum options for K-12 schools. Other online teaching tools became possible with the development of learning management platforms such as Blackboard in 1997 (Justin, 2022), Canvas in 2011 (Sulun, 2022), and Google Classroom in 2014 (Su, 2016). Content management systems and learning management systems eventually provided a framework for district-operated virtual programs to use their own teachers to provide fully online learning, blended learning, and hybrid learning to their students. Figure 2 provides a timeline showing the evolution of eLearning as instructional methods adapted to the available technology.

Figure 2

Timeline and Major Technology Platforms in the Evolution of eLearning



Sleator, 2010, p. 322

The hybrid learning model gained national attention when two high school Chemistry teachers from Colorado, Jonathan Bergmann and Aaron Sans, pioneered a flipped classroom in 2006 (Noonoo, 2012). In the flipped classroom model, students are pre-taught information through home video instruction. This process frees up classroom time to work through concepts students need additional practice or guidance in understanding. Additionally, it allows teachers to provide increased individualized support for students, which might be impossible in a large-group face-to-face session.

Online learning is continuing to grow and develop. In the past five years, we have seen more school districts develop hybrid and blended learning programs as well as full-time district-operated K-12 virtual schools. In larger school districts, virtual programs may utilize teachers from within the district through content management software or a learning management system. Smaller schools and districts often rely on suppliers and vendors to provide services through a CMS (Gemin et al., 2017). The e-learning market in the United States for educational purposes is a promising area of development, causing many suppliers and vendors to compete for this market share and putting increased pressure on school officials to ensure that educational service providers continue to meet student learning outcomes and accountability standards. The worldwide market size of online education was approximately \$187.87 billion (about \$580 per person in the US) in 2019, a 400% increase from six years previously, and is projected to grow to over \$319 billion (about \$980 per person in the US) by 2025 (Sarkar, 2020). “The good news is that there is very little a school needs that is not available from one, and usually several suppliers. The bad news is that it is becoming harder and harder for schools to sort out and make sense of the huge fabric of offerings” (Gemin et al., 2017, p. 13).

While online learning has more shallow roots in the K-12 education system than in the higher education system, the pandemic brought e-learning to the forefront of critical educational trends. The money provided through federal funds and school systems' response to COVID-19 made online learning universal for all teachers and all students for a brief period. This time, Zhao (2021) argues "ultimately provided Internet access and digital devices to millions of students who did not have such access at home prior to the pandemic" (p. 26). It also jumpstarted educators into action. Zhao (2021) notes, "education technology researchers and advocates had been trying to convince teachers to make greater use of technology in the classroom for decades without much success" (p. 26).

Emergency remote learning broke down borders that defined when, where, and how education could occur (Zhao, 2021). With school buildings closed, students were no longer constrained by in-school seat time and bell schedules (Hehir et al., 2021). Instead, students had access to learning materials 24/7 and demonstrated greater autonomy and self-directed learning (Arnett, 2021). Students turned their vision of the school building as the central location of knowledge and investigated the global community for additional learning resources and experts (Barbour, 2021). Students also began looking past their instructor to other sources of knowledge, and learning spaces expanded beyond the classroom walls. In a move toward learning without borders, students began learning from experts through video content limited only by the Internet (Boardman et al., 2021). Students experienced virtual field trips, videos from content experts, and real-world virtual learning experiences (Derakhshandeh & Esmaeili, 2020).

Scholars have pointed out that the type of instruction that occurred in the months after the forced shutdown of schools in March 2020 was emergency remote teaching, which is different

from the purposeful and intentional planning associated with online learning (Barbour, 2021). Hodges et al. (2020) described emergency remote teaching as

A temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances. It involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated. The primary objective in these circumstances is not to re-create a robust educational ecosystem but rather to provide temporary access to instruction and instructional supports in a manner that is quick to set up and is reliably available during an emergency or crisis. (para. 13)

In contrast, online learning consists of an intentional course structure and carefully selecting pedagogical strategies and tools to address the unique needs of asynchronous learning (Hart et al., 2019). The distinction between the two titles underscores the fact that the K-12 education system was unprepared for the overnight transition to emergency remote learning. The system was ill-equipped to handle the systemic changes and adapt to the demand for new pedagogical strategies to address online learning needs (Barbour, 2021). Moving forward, staff who excel at virtual learning and online course design can be hired to teach online courses, mitigating many of the emergency remote learning issues (Simmons, 2022).

Interestingly, the COVID-19 pandemic is not the first time emergency remote learning has been used at the K-12 level to provide continuous instruction during a crisis. During the 1919 Spanish flu pandemic, the telephone was used to instruct some California high school students (McCracken, 2020). During World War II, thousands of young men had to be taught swiftly and precisely how to operate radios, battleship guns, and bomb sights. Many of these men learned what they needed to know at a distance from printed materials sent from Washington, D.C.

(German, 2020). During the polio epidemic in 1947 and 1948, New Zealand educational leaders used correspondence courses to provide students with ongoing instruction (German, 2020). In the early 2000s, online learning was used by schools in Bolivia, Canada, China, Hong Kong, Japan, and Singapore during the SARS and H1N1 outbreaks (Barbour et al., 2011).

By the fall of 2020, many public schools in Oklahoma had opened full-time, district-operated virtual academies within the public-school system. Before the pandemic, Oklahoma students who wanted a full-time virtual education typically attended one of the six Oklahoma Statewide Virtual Charter Schools. District-operated virtual programs typically only offered some students limited virtual learning opportunities for remedial or advanced classes. Additionally, district-operated schools varied in the amount of asynchronous and synchronous instruction provided. The Oklahoma Statewide Virtual Charter Schools had the upper hand in being equipped to provide online learning to a broader range of students. At the same time, district-operated programs were better equipped to meet individual learning needs and were often more sensitive to the needs of local stakeholders (Eger, 2022).

The shallow roots of virtual learning in the K-12 environment pointed out the need for instructors to equip their teaching toolbox with new instructional strategies and technology tools. Teachers thrust into emergency remote learning could not rely on their existing lesson plans or replicate every in-person class activity with an online version. In addition, teachers were challenged to learn innovative technology to deliver lessons online instead of through direct classroom instruction. Though K-12 online learning is relatively new to the scene of virtual learning, it is not going away and has forever changed the way we instruct students from this point forward. Since virtual teaching is here to stay, the whole student must be considered regardless of their learning environment. Educators must have a toolbox equipped to handle the

demands of an online learning environment (Darling-Hammond & Hyler, 2020; Hodges et al., 2020; Herold, 2022; Johnson et al., 2023).

According to De Vynck and Bergen 2020, amid the COVID-19 pandemic, Google Classroom emerged as one of the most widely used applications. The user base for Google Classroom quadrupled from 40 million to 150 million in the weeks following the school shutdown (Herold, 2022). What was once used as a supplemental tool became a centralized hub of learning. Another 2021 study by Hussein et al. concluded that many teachers who first began using Google Classroom to communicate and provide activities for students during emergency remote learning planned continued use of the platform after the pandemic.

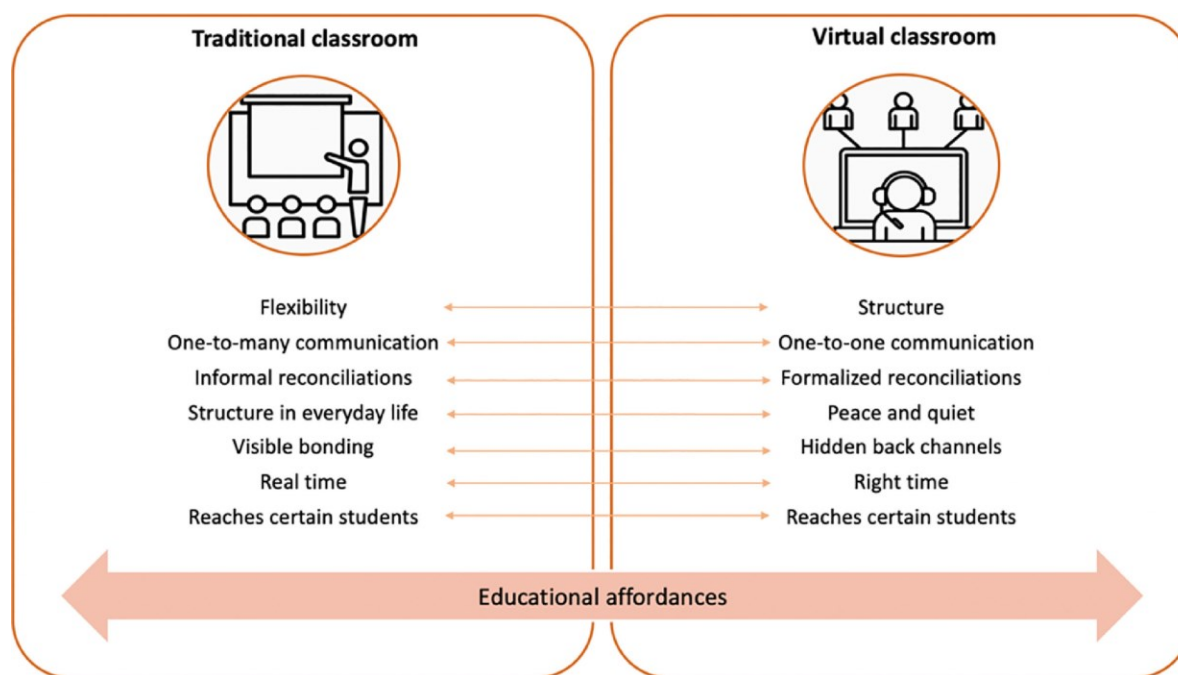
Another significant discovery that was made during emergency remote learning was that many students realized online learning was not their ideal learning environment, especially full-time asynchronous coursework (Simmons, 2022). Some students suffered from feeling isolated or disconnected from the classroom environment. The ongoing decrease in interaction between students and the instructor caused adverse emotions like anxiety, sadness, and depression (Derakhshandeh & Esmaili, 2020). Conversely, students who might never have been exposed to online learning outside of the pandemic discovered they thrived in a virtual learning environment (Simmons, 2022). After returning from the pandemic, students' exposure to online learning sparked an interest for many to continue learning in full-time, blended, or hybrid learning models.

Differences Between Online Learning and Face-to-Face Learning

Many distinguishable differences exist between online and face-to-face learning outside of the transactional distance in space and time. Each educational setting provides specific affordances or environmental characteristics that influence a student's learning potential

(Willermark & Island, 2022). Online courses are more self-directed, while face-to-face courses are often more teacher directed. In a face-to-face classroom, students can interact with their instructor and get immediate feedback about their learning as they need it (Liu et al., 2021). Meanwhile, online students depend on course facilitation, clearly defined assignments, and specific feedback from the instructor to meet their learning needs (Dorn et al., 2020). Online courses often require increased student engagement because the instructor cannot gauge student progress in the same ways as a physical classroom (Boling, et al., 2012; Johnson et al., 2023).

Figure 3 shows some of the contrasts between the educational affordances in traditional classrooms and those in a virtual classroom (Willermark & Islind, 2022). In traditional classrooms, teachers can spontaneously change how the lesson is taught in reaction to small talk, body language, and how students respond to learning. Meanwhile, online instructors must employ more formalized reconciliations and methods of gauging student progress and humanizing the learning process (Boling et al., 2012). Formal structures such as writing prompts or exit tickets provide online instructors opportunities to gain insight into students' thinking or understanding (Rovai, 2002 April). In a virtual classroom, students rely on the facilitation of coursework to be highly structured and instruction to be more planned and intentional (Keeton, 2004). Overall, since face-to-face courses occur at a specific time and place, and students must actively listen and participate in real-time activities, they are generally considered less flexible. Meanwhile, online courses allow a flexible schedule and learning at the right time for the student; however, successful online learners must be self-motivated, self-disciplined, self-directed, and good at time management. Online courses provide affordances to a growing population of students with disabilities and health issues for whom a traditional classroom might be a hindrance (Liu et al, 2021).

Figure 3*Educational Affordances in the Traditional Classroom Versus Virtual Classroom*

Willermark & Islind, 2022, p. 7.

Communication in a traditional classroom is both one-to-one and one-to-many. Communication in an asynchronous virtual classroom is slanted more toward one-to-one communication. These one-on-one conversations give students additional attention from the instructor they might not typically receive in a traditional classroom (Berry, 2019). In online learning, the vast majority of communication involves non-verbal asynchronous correspondence. Some students, especially shy students, may feel more comfortable expressing their thoughts or asking questions in an asynchronous online environment (McBrien et al., 2009).

The traditional classroom is often full of conversation, and students spend a portion of their school day in non-instructional activities such as lunchtime, passing periods, and the time before and after school (Krause & Goering, 2021). In contrast, the virtual classroom affords a

study environment characterized by peace and quiet, free from the distraction of classmates (Bao, 2020). While some students thrive in a traditional classroom in these social activities, others find the elevated level of interactivity overwhelming and overstimulating (McBrien et al., 2009). Additionally, if needed, online students can go back to reread or rewatch selected parts of a lesson. Online courses appeal to students who learn best when they can review course materials multiple times and through various modes (Britt, 2015).

Other educational affordances in a traditional classroom include the visible evidence of student bonding and exclusion. The virtual classroom offers hidden back channels, making it impossible to notice if a student is uninvited to a larger group. However, these same back channels also enable cheating (Willermark & Islind, 2022). Vrasidas and Zembylas (2004) identified four strategies to reduce cheating and plagiarism in online courses. Create assignments that require students to (1) use their own experiences, (2) apply ideas to real-world contexts, (3) work collaboratively with peers, and (4) negotiate assessments with the instructor.

Both traditional and virtual classrooms are suitable for certain groups of students. For some students, the virtual classroom removes barriers to participation. Willermark and Islind (2022) assert, “each of these settings caters to different needs and affords different teaching and learning behaviors and fits different students although the purpose and activity—teaching and learning—are the same” (p. 7).

Best Practice Online Instructional Strategies

One widely accepted source of best practices for online instructors is the National Standards for Quality Online Teaching (NSQ, 2019). Some of their recommendations include focusing on student-centered personalized instruction, instructional design for online courses, fostering community building, and the active use of technology. School districts can build robust,

high-quality online instructional programs by utilizing the educational affordances of an online classroom and best practices for online instruction. Moreover, many of the skills reported in literature as best practices for online teaching were first demonstrated as evidence-based practices in face-to-face settings (Johnson et al., 2023; Moore et al., 2021). Therefore, educators can use what they know about quality instructional strategies, adolescent development, and educational pedagogy to modify practices to exploit the affordances of an online platform.

Student-Centered Personalized Instruction

A central concept of a thriving asynchronous online learning environment is the idea of constructivism and student-centered personalized instruction. Constructivism is a philosophy of learning that suggests that students gradually build their understanding of the world and construct their knowledge from experiences and interactions with the world around them (Rovai, 2004). It is a powerful model of how students actively create, correct, or confirm knowledge and learn by forming their own conclusions (Shah, 2019). Constructivism is intended to activate curiosity and encourage students to observe and hypothesize about the world around them. Accordingly, the constructivist viewpoint puts the learner at the center, actively processing information and constructing their own meaning and knowledge. With a constructive approach, teachers become facilitators of information and assist students in connecting their previous knowledge with new insights. McLeod (2019) suggests, “information may be passively received, but understanding cannot be, for it must come from making meaningful connections between prior knowledge, new knowledge, and the processes involved in learning” (para. 8). Table 2 demonstrates the elements of emphasis in a traditional learning environment versus a constructivist learning environment.

Table 2*Elements of Emphasis in a Traditional vs. Constructivist Learning Environment*

Traditional	Constructivist
<i>Instructional emphasis</i> Direct instruction, knowledge reproduction, Whole group learning, competition	<i>Instructional emphasis</i> Self-guided learning, knowledge construction, collaboration, self-reflection
<i>Classroom activities</i> Teacher-centered, direct instruction, fixed curriculum	<i>Classroom activities</i> Learner-centered; Socratic and authentic pursuit of student questions and interests
<i>Instructor roles</i> Expert, source of knowledge, student monitor, directive, rooted in authority	<i>Instructor roles</i> Collaborator, facilitator, encourager, community builder
<i>Student roles</i> Listener, consumer of knowledge, note taker	<i>Student roles</i> Active collaborator, a constructor of knowledge, self-monitoring
<i>Assessments</i> Fact retention, fact reproduction	<i>Assessments</i> Authentic knowledge application, portfolios, projects, performances

Adapted from Rovai (2004), p. 81 and McLeod (2019), p. 5

In a constructivist classroom, the teacher's primary responsibility is creating a student-centered environment where students actively participate in their learning. This does not mean the teacher takes a back seat and forces students to learn the concepts independently (Shah, 2023). Instead, the teacher acts as a collaborator and facilitator of learning instead of the original source of knowledge (Rovai, 2004; Shah, 2019). Jonassen (1994) suggested that constructivism could be applied to virtual education by designing learning activities that:

Focus on knowledge construction, not reproduction...Present authentic tasks...provide real-world learning environments ...foster reflective practice and enable context and

content-dependent knowledge construction ...support collaborative construction of knowledge through social negotiation, not a competition among learners for recognition. (p. 35)

A constructivist classroom is the outcome of interactions and communications between the learner and course materials, the instructor, and their peers. It is less focused on the teaching paradigm of providing instruction and more focused on the learning paradigm and producing learning outcomes for students (McLeod, 2019). According to Jonassen (2000), online learning offers an ideal environment to assist learners in reflecting on their own thinking and interacting with course materials in a meaningful way. Learners use technology tools to interact with their classmates and instructors to demonstrate how they have constructed their knowledge from course materials.

Instructional Design for Online Courses

While online learning is ideally student-centered and constructivist in nature, the teacher still plays a crucial role in a student's learning experience. The teacher is responsible for the course's instructional design, building a classroom community, and actively using technology. In fact, Dalton (2018) credits the instructor as the most crucial factor in online student achievement. The instructor's presence is vital to students' overall learning experience (Kennette & Redd, 2015; Marzano & Marzano, 2003; Richardson et al., 2016; Wilson, 2018). Rios, Elliot, and Mandernach (2018) emphasize the importance of course design as a key to student satisfaction with online learning. Online courses should be "user-friendly, easy to navigate, and incorporate clear guidance (Rios et al., pg. 1, 2018)". In addition, students should be engaged in course content through visual, written, and relevant experiences (Kaufman, 2015). Setting clear student expectations about engagement, communication, instructor availability, and workload are other

critical considerations for teachers preparing to teach online (Hehir et al., 2021; Northcote et al., 2019).

Gaytan and McEwen (2007) found two essential components for online instructional design: the use of various instructional strategies to appeal to multiple learning styles and the practice of providing meaningful and timely feedback on the quality of student work. As instructors create course plans for various learning styles, they also need to consider that there is not a one-size-fits-all online teaching model that works for every online classroom and every content area (Lewis, 2020). Online instructors must understand that different content areas may dictate different instructional strategies and instructor involvement. For example, the hard sciences and mathematics may require more guided practice, videos, and self-checking strategies for students to master content (Steele et al., 2019). Meanwhile, history and literature classes might benefit from an online discussion board, guided notes, or study guides (Steele et al., 2019). Regardless of the subject area, students learning online need to be meaningfully engaged in the learning process (Britt, 2015).

Simmons (2022) suggests the following ways to improve the quality of instructor feedback. Instructors should provide students with specific feedback on where they excel and where they can improve. Feedback should be immediate and goal-oriented (Jamison & Bolliger, 2020; Martin, 2019; Simmons, 2022). In order for students to use feedback to increase their performance, it needs to be given promptly and clearly articulate how they might progress toward their goals (Whiteside, 2015; Smith & Diaz, 2004). Martin (2019) rated timely feedback on assignments and projects as the highest component in developing connectedness.

Studies have shown that students appreciate having a say and choice in receiving information and course content (Lee et al., 2015; Mandernach et al., 2018). Rovai (2004)

suggests that online instructors provide pre-reading organizers and post-reading guides to help students construct meaning from online assignments. Providing additional study aids such as chapter summaries, self-tests, flashcards, interactive exercises, and multimedia resources “can add a level of richness and diversity that would be difficult to otherwise achieve” (Rovai, 2004, p. 84).

Body language, eye contact, and physical gestures are powerful teaching tools in a traditional classroom. However, in an online classroom, teachers should focus more on their voice and vocal functions (Mahmood, 2021). Fiorella et al. (2019) found that the instructor's social and cognitive cues during a video lecture can influence a student's learning, attention, and engagement in video lectures. Meanwhile, other researchers have suggested that online teachers should develop more interactive classes by asking questions and promoting class discussions (Townsend et al., 2002; Smith & Diaz, 2004; Bao, 2020). Like a traditional classroom, online class activities or discussions should be divided or chunked into multiple small tasks of less than 30 minutes each (Bao, 2020).

Fostering Community Building

Attempting to foster connection and community is particularly important in an online learning environment due to the transactional distance between learners and their instructors (Boling et al., 2012). The asynchronous virtual classroom has presented challenges in fostering a close and connected relational environment for some students (Booker, 2021; Martin, 2019; Quin, 2017), but there are easy practices that instructors can use to build relationships. Berry (2019) found that the first step in forming an online community was to connect with students by sending a welcome email and maintaining regular communications throughout the course. Martin et al. (2018) found that when teachers started the course with video-based introductions, students

rated this strategy highest in increasing connectedness. Teachers who establish a good rapport and collaboration with students have prominent levels of student engagement (Gaytan & McEwen, 2007). Feeling connected to others in an online setting can lead to increased student achievement and learner satisfaction (Borup et al., 2019; Whiteside, 2015).

Martin (2019) reported that students want to know that a genuine, caring person is working with them and suggests instructor-created videos to make course content more personal and relatable to students. Sharing stories and encouraging discussion can also create a sense of connectedness. Darius et al. (2021) found that instructional methods such as opportunities to collaborate with peers, instructor-created video lectures, and instructor-created materials promoted student engagement and successful online learning. Furthermore, Krause and Goering (2021) insist that an online instructor must facilitate opportunities for meaningful learner-to-content, learner-to-teacher, and learner-to-learner interactions to build community. These interactions are essential to student success. Encouraging students to interact with each other and fostering a sense of collective efficacy through classroom activities are vital strategies instructors can use to help students connect with the classroom community (Berry, 2019).

The Active Use of Technology

Teachers can actively use technology to enhance online learning by facilitating peer-to-peer collaboration, real-time interactions with experts, interactive trivia, chat features and discussion boards, interactive presentations, and immediate feedback to online assignments (Simmons, 2022). Derakhshandeh and Esmaelili (2020) proposed a three-tiered communication model for online instruction called tele-instruction. This model is based on appointments, videoconferencing, and a learning management system. Each of these three components is meant to address a form of online communication. Appointments and videoconferencing provide

learner-instructor interaction, while the learning management system provides learner-learner and learner-content interaction.

The first tier of the tele-instruction model is appointments. Instructors provide available time slots every week for students to book an appointment with them. Students can subsequently utilize the online calendar to set up a meeting during a time of mutual convenience. The online calendar will give the student and instructor an automatic invitation and link to the online meeting. Appointments allow students to “decide to what extent they need direct contact with the instructor” (Saba, 1998, p.1). Boardman et al. (2021) found that students liked to use teachers' office hours to ask questions privately.

The second tier is video conferencing, in which the instructor and student communicate using online technology such as Zoom, Google Meet, or another video conferencing platform. These face-to-face communications allow students to receive feedback, resolve misunderstandings with course content, or simply be seen and heard by the instructor. The instructor gains valuable feedback regarding the course and may provide extra resources or guidance as needed.

The third tier is a Learning Management System (LMS). The LMS is the central hub of the course content and serves as a communication tool to house all course materials and additional resources. Students can interact with the course content independently and at their own pace, taking advantage of the freedom to choose from time and space restrictions. Through discussion boards, students can also use the LMS to communicate with their peers. Discussion boards allow students time to think out their responses and allow each class member to have their voice heard (Smith & Diaz, 2004). A 2020 study by Lin and Gao found that students expressed a strong sense of community in asynchronous online formats. They felt free to offer their

viewpoint and were more comfortable responding to questions and comments after having time to think about their responses.

While technology has made online learning possible, the fundamental nature of education itself has not changed (Johnson & Aragon, 2003). A challenge for online instructional designers is to take the best of the traditional without succumbing to the conventional paradigms of instructional teaching strategies for lack of creativity and innovation.” Regardless of format, the primary focus of instruction is to connect with students and produce strong learning outcomes. When designing an online course, instructors should capitalize on the benefits online platforms offer while minimizing the known challenges (Thomson, 2010; Barbour et al., 2011). Online courses should be well organized and contain a detailed syllabus, course calendar, useful links, and thorough assignment instructions (Lewis, 2020). Instructors should clearly outline course expectations, chunk course information into digestible pieces, and anticipate areas of potential misunderstanding (Thomson, 2010; Moore et al., 2021). Furthermore, school leaders must steward an accountability system that ensures online students receive equitable academic support and rigorous instruction as the students who learn in a purely face-to-face environment (Sleator, 2010).

Weaknesses of Online Learning

Historically, K-12 online education has been plagued with a variety of issues. Three of the most prominent weaknesses of online learning have centered around the lack of access to Internet-accessible devices and high-speed Internet by all students, a lack of student participation and academic progress in online programs, and online instructors who were not adequately trained to support online instruction with best practices (Cutri et al, 2020; Barbour, 2021).

The most prominent concern of online learning has been the inequitable access for many students to Internet-accessible devices and high-speed Internet. A study by Gilbert in 2015 confirmed that the most fundamental and frequent challenge for high school students taking an online course was the lack of reliable Internet at home. In her book, *Building a Successful Community*, Amy Jo Kim (2000) suggested that a participant in an online community must have an Internet-accessible device, knowledge of how to use it, and consistent and reliable access to the Internet to gain full access and entrance into the virtual community. If students have technical issues or lack access to the virtual community, their progress is limited or stalled completely.

A June 2020 report published by Common Sense Media found that 15 million to 16 million American K-12 public school students (about 30%) lacked adequate connectivity, an adequate Internet-accessible device, or both (Chandra et al., 2020). Inequities and challenges to online learning result from the digital divide between those with and without access. This challenge severely affects southern, more rural states like Alabama, Arkansas, Oklahoma, and Mississippi (Ali et al., 2021). Moreover, the digital divide disproportionately affects lower-income families and Native American, Black, and Hispanic students (Chandra et al., 2020). Of the students in the digital divide, approximately nine million need a device or adequate Internet, and approximately five to six million have a device but need better connectivity. In comparison, 1 million students have adequate connectivity but attempt to learn on a cell phone or a smart TV (Chandra et al., 2020). Simmons (2022) states, “Virtual education can magnify inequities in resources, such as a dedicated space to do schoolwork and access to caregivers who can provide guidance” (p. ii).

In Oklahoma, almost 200,000 students were identified without an adequate Internet-accessible device in 2020, including desktop computers, laptops, or tablets (Chandra et al.,

2020). While many of these students have access to the Internet through a mobile phone, iPad, or SMART TV, these devices are inadequate for sustained online learning. Students trying to learn on a mobile device face notable challenges such as (1) incompatibility with homework, textbook, or content management systems, (2) difficulty using a small screen to read and digest copious amounts of information, as well as (3) difficulty typing and producing assignments (Chandra et al., 2020). Adequate Internet connection is defined as Internet with sufficient speeds for distance learning, at least 25/3 Mbps (download/upload speeds) (Chandra et al., 2020). With Internet speeds of 25/3 Mbps, it would still take approximately 3 minutes to upload a half-hour video full at 720p resolution (Chandra et al., 2020, p. 8).

To meet the most basic needs of online learning, K-12 education stakeholders need to achieve a 1-to-1 student-to-device ratio (Chandra et al, 2020). Even in homes that report having access, students may still have to share a device with siblings or a working parent. Education leaders must also advocate with network providers to maintain high-speed Internet service for their community (Chandra et al., 2020). Other areas of concern with providing access include providing technical support to troubleshoot technical issues with digital resources and providing additional training about using the course resources (Ali et al., 2021). When Internet connections are sufficient and class materials are easily accessible on both mobile devices and laptops, the flexibility of online learning can overcome accessibility issues (Basilaia & Kvavadze, 2020).

Other instabilities plaguing K-12 online courses include a general lack of student participation and academic progress (Darrow-Magras, 2015; Humber, 2018; Kebritchi et al., 2017). Edwards (2017) found that many high school students did not feel that online learning fit their learning style or cultural background. Some teachers have reported finding it challenging to identify, approach, and motivate students working on an asynchronous platform who need

additional support. In June 2020, the American College Test (ACT) sent an email survey to high school students who registered to take the ACT on a national testing day in April or June 2020. Of the 7800 students who responded, at least three out of four indicated needing additional support to succeed in online learning (Moore et al., 2021). Nevertheless, while 90% of students reported needing clear and understandable materials, only 66% reported receiving them. Students also said additional learning issues if they could not easily communicate with their teachers and receive timely responses to questions (77%) (Moore et al., 2021).

Perhaps another reason some of the K-12 students have not been successful in an online learning environment is that they have been forced to take classes in a virtual format rather than volunteering for this form of learning. For many years, high schools have offered credit-recovery courses through an online format only, forcing students who are behind in credits to participate in this style of learning (Heppen et al., 2017). Additionally, virtual learning has been forced on many students with complex school discipline issues, health-related problems, and issues with the court system (Barnett, 2016). Online learning has been the only choice for some students who want to stay in school.

Although asynchronous learning is not synonymous with working in isolation, it often becomes a type of learning with little face-to-face interaction and two-way communication (Derakhshandeh & Esmaili, 2020). During emergency remote learning in the spring of 2020, many college students reported experiencing isolation and increased depression and mental health concerns (Derakhshandeh & Esmaili, 2020).

Furthermore, the lack of K-12 teacher training and professional development have been other weaknesses of online learning programs. Online teachers have sometimes struggled to use appropriate pedagogy and learning theories and apply known best practices to a virtual learning

environment (Arghode et al., 2017). A study by Lisa Kirtman in 2009 found that the main difference in student learning outcomes between traditional and online classes revolved around teachers adjusting classroom practices to online learning. In an online classroom, students must interact with their peers and instructors more intentionally. Students must ask the instructor more questions and take additional responsibility and ownership in learning the course material. The students' suggestions for improving learning were to "increase small group and large group class discussions" (Kirtman, 2009, p. 110). Professional development can help teachers embrace the unique components of online learning, such as video instruction that allows students to repeat lectures and re-watch instruction or discussion boards that provide students time to compose entries or reply to classmates (Steele et al., 2019).

Conceptual Framework

The present study utilizes a conceptual framework emphasizing the importance of connectedness, learning, and classroom community in all educational settings. The survey used in this study is based on the work of Alfred Rovai, who framed the concepts of connectedness, learning, and classroom community based on the constructs of McMillan and Chavis' sense of classroom community.

Sarason's Sense of Community

Psychologist Seymour Sarason (1974) is regarded as the pioneer of the construct of sense of community. Sarason described a sense of community as "the sense that one was part of a readily available mutually supportive network of relationships upon which one could depend, and as a result of which one did not experience sustained feelings of loneliness" (p. 1). Gusfield (1978) further clarified the differences between the two primary uses of the term community. The first is based on a shared geographical location, and the second is based on relationships. For

this study, the term classroom community is used to describe both a shared virtual classroom space and the relationship created by interacting with classmates and the instructor within the same online course. However, classroom community members will interact for a limited period while simultaneously enrolled in the same course.

McMillan and Chavis' Sense of Classroom Community

David W. McMillan and David W. Chavis built on Sarason's work. The four-dimensional framework first proposed by McMillan in 1976 was further refined by McMillan and Chavis in 1986 to include the dimensions of membership, influence, needs fulfillment, and shared emotional connection. McMillan and Chavis (1986) defined a sense of community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (p. 9).

The first dimension of membership "is the feeling of belonging or of sharing a sense of personal relatedness" (McMillan & Chavis, 1986, p. 9). The second dimension encompasses the idea of influence. McMillan and Chavis (1986) state that influence is "a sense of mattering, of making a difference to a group and of the group mattering to its members" (p. 9). The third dimension focuses on needs fulfillment, "the feeling that members' needs will be met by the resources received through their membership in the group" (p. 9). The fourth dimension is a shared emotional connection. It is "the commitment and belief that members have shared and will share history, common places, time together, and similar experiences" (McMillan and Chavis, 1986, p. 9).

In 1996, McMillan further refined his definition of a sense of community by renaming the four specific dimensions that must be present to feel a sense of connectedness to the

community, including spirit, trust, trade/interaction, and art/learning. Consequently, after more than 40 years of research, the 1996 McMillan and Chavis model of classroom community still serves as the primary anchor for most studies in the sense of classroom community.

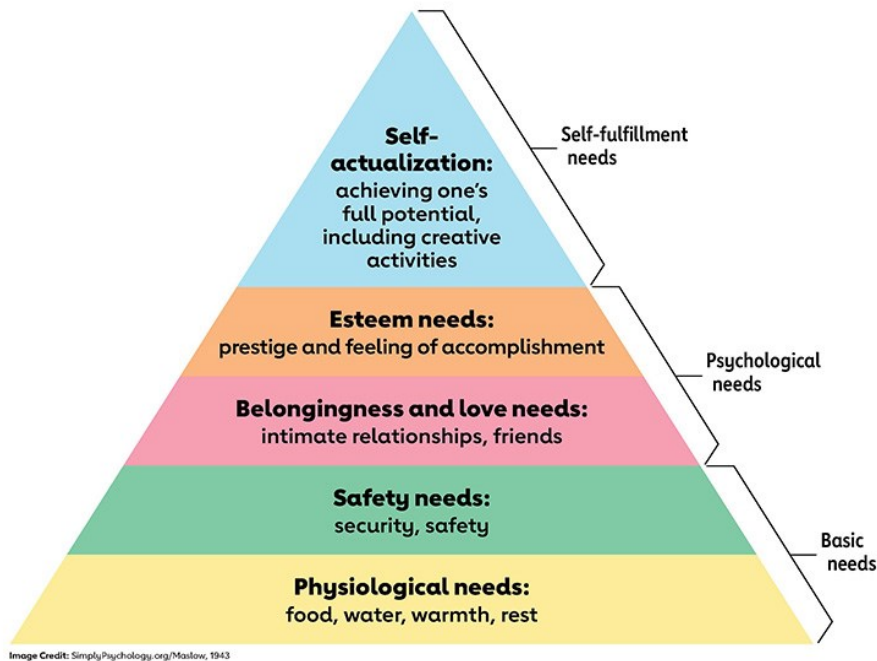
Spirit. Spirit, the first dimension of a classroom community, aligns with the concept of membership in the classroom community, feelings of belonging, personal relatedness, and acceptance. Spirit is expressed by demonstrating one's identity as a classroom community member. It leads to feelings of emotional safety, friendship, cohesion, satisfaction, and connectedness to a group identity. In an online learning environment, spirit includes the ability to access the online community and a desire to participate and converse with classmates and the instructor throughout the course. Through spirit, the learners in a classroom community both nurture and challenge each other. Spirit includes the first three online learning needs outlined in Kim's Online Hierarchy of Needs, shown in Table 3. Kim suggests that students must first have access to some fundamental basics, such as a device to access the online learning environment, reliable Internet, and knowledge of navigating the learning platform. Students must feel safe to be involved and have a space to engage in the online environment. Other basics that meet social needs include course structure, order, consistency, and belonging to the classroom community. These fundamental basics allow students to strive toward self-esteem and self-actualization in an online learning environment.

Table 3*Kim's Online Hierarchy of Needs*

Human Needs	Offline	Online Learning Needs
Physiological Needs	Oxygen, water, food, clothing, shelter, health, warmth, sleep	Access to reliable Internet and an Internet-accessible device; the technical ability to participate in the online community; space to engage in online learning
Safety and Security Needs	Protection from crimes and war, safety, security, protection, stability, structure, order, sense of fairness and justice	Protection from hacking and personal attacks; structure, order, consistency: the sense of having a "level playing field" with others
Social (or Connectedness) Needs	The ability to give and receive love; the feeling of connection to a group	Belonging to the classroom community and to subgroups within the community
Self-esteem Needs	Status, recognition, attention, self-respect, confidence, prestige, competence, achievement; ability to contribute to the community	The ability to contribute to the course/community and be respected and recognized for those contributions; Competence and achievement; status, recognition, attention, feedback
Self-actualization	The ability to develop skills and fulfill one's potential	The ability to take on a leadership role in the course/community that develops skills opens up new opportunities and challenges oneself.

Online Hierarchy of Needs - Adapted from Kim (2000), p. 9

Furthermore, the dimension of spirit can be compared with the belonging and love needs at the center of Abraham Maslow's hierarchy of needs, shown in Figure 4 (Maslow, 1943). After a person's basic physiological and safety needs are fulfilled, the human psychology needs for belongingness and love emerge to motivate behavior. These belonging and love needs include friendship, intimacy, acceptance, and affiliation (Maslow, 1987).

Figure 4*Maslow's Hierarchy of Needs*

from <https://www.simplypsychology.org>

The need for spirit and community in an educational environment is not exclusively unique to students. Nowell and Boyd (2010) found that online teachers also expressed a need for spirit and community. According to Terosky and Heasley (2015) online teachers have a need for a sense of community and collegiality with fellow online instructors as it relates to online course development and online instruction. Additionally, online instructors need professional development in the art and science of teaching online and time to collaborate with peers to share best practices and ideals for course design. Access to a professional learning community can accelerate professional growth and a sense of spirit for online teachers.

Trust. Trust is the second dimension of classroom community. Trust is a feeling of community order, safety, and influence. It involves making a difference or mattering to a group.

Trust is built on members proving their credibility and benevolence toward one another, leading to a sense of safety in contributing ideas, relying on one another, and receiving constructive feedback (McMillan, 1996). Community members can speak openly and trust the others in the group with their ideas. Both Maslow and Kim described this concept of trust as esteem needs in which an individual will desire feelings of dignity, achievement, independence, and respect. Students will demonstrate trust by contributing to the classroom learning environment (Keyes, 2019). Within the online classroom, students must feel safe contributing and participating without fear of negative interactions with community members (Korpershoek et al., 2020). Students who feel unsafe from criticism may withdraw from interactions or keep their ideas private instead of collaborating with classmates (Lamblin et al., 2017; Hart et al., 2019).

Furthermore, instructors play an essential role in developing a sense of trust within the classroom community. Instructors are responsible for designing online courses using a high level of structure, order, and consistency to build trust with their students. At a minimum, online instructors should provide a syllabus, grading rubrics, exemplary work samples, and a calendar of assignment due dates to allow students to develop trust and ownership in their learning (Gulosino & Miron, 2019; Mahmood, 2021). Additionally, fair grading procedures and clearly defined course expectations provide students with the sense of having a level playing field (Simmons, 2022).

Once a culture of spirit and trust has been established, classroom community members can begin to interact and learn from each other. This interaction and learning can lead to the highest level on Maslow's hierarchy, self-actualization, self-fulfillment, or reaching one's full potential. A desire "to become everything one is capable of becoming" (Maslow, 1987, p. 64).

Kim, 2000, correlates self-actualization in an online course with one's ability to fully contribute and develop skills while also challenging oneself.

Trade/Interaction. Trade or interaction, the third component of classroom community, is the process by which members identify similarities and differences among themselves. Members recognize a connection due to sharing a common experience. Participants disclose personal information and engage in exchanges that promote friendship and feelings of trust. When community members share their strengths and trade resources with each other, they feel closeness resulting from their similarities while also benefiting from their differences. Students who feel a sense of closeness or connectedness with each other begin to engage in a reciprocal exchange of help and resources (De Risio et al., 2024). Interaction can be tangibly expressed by the level of participation a student exhibits in an online classroom. A study by Black, Dawson, and Priem in 2008 found a significant relationship between the LMS data logs of online students and their feelings of connectedness and sense of classroom community. The total number of logins, discussion posts, and other classroom interactions used simultaneously with survey data predicted a sense of community and connectedness (Black et al., 2008).

Art/Learning. Art or learning, the final component of classroom community, is the feeling that the educational needs of the community members are being met when they have contact with one another. Students share common learning expectations and a joint commitment to a shared goal. Members acquire knowledge, understanding, and achieve learning goals as they connect in time and space. A 2015 study by Whiteside suggests that students and instructors find social presence to carry significant value and importance. Learning increases through interactive and "collaborative experiences with both instructors and peers" (Whiteside, 2015, p. 4). Social learning theorist Etienne Wenger's (1998) theory of learning states that engagement in social

interactions is at the center of the learning process. Engaging with others is essential to making sense of the world around us, developing our personal identities, and finding our placement in the world. As humans, we naturally crave connections with one another in our learning environments.

In the case that all four levels of a classroom community (spirit, trust, interaction, and learning) are met with fidelity, students have the greatest chance to reach their full potential to contribute and play a positive role in the classroom community. The highest level of classroom community involves taking on leadership roles, encouraging other students, and shaping the culture of the virtual community (Kim, 2000).

Connectedness

Connectedness, as a general mental state, is closeness and positive attachment to people and the social and physical world (Seppala et al., 2013). As social beings, connectedness is foundational for human learning and growth (Arslan, 2018). It also serves as a protective factor against depression (De Risio et al., 2024). Social relationships and connectedness promote health and well-being (Lambin et al., 2017). When online students are connected to a community, they are more likely to persist, cooperate, and feel satisfied (Rovai, 2001). One of the main concerns with asynchronous online learning environments for K-12 adolescents is that students may feel disconnected from their peers, teachers, course content, or learning activities (Jamison & Bolliger, 2020).

Feeling connected means being cared for by others and being a part of a group or community. Connectedness starts with access to the community and grows as relationships of trust, interaction and interdependence develop among community members. School connectedness is when students feel their teachers and peers care about their learning and

involvement in the classroom community (Sieving et al., 2017). Adolescence is a time when the parts of the brain regulating connectedness are developing, and teens are learning to navigate social situations through firsthand experiences (Lambin et al., 2017). Students who are connected feel like their presence matters and that they are influential and valued classroom community members (Arslan, 2018). Connected students move from being isolated, individual learners to active, collaborative members of a virtual learning community (Beise & Wynekoop, 2001; Steiner et al., 2019).

Classroom Community

Students with a strong sense of classroom community have positive attitudes toward other students (Anli, 2019). Students' sense of community is formed from student-to-student interactions, teacher-to-student interactions, and student-to-course materials (Anli, 2019; Barrett, 2021). “Researchers are generally unanimous in agreement: students learn better when they can engage with one another as they learn new concepts” (Young et al., 2017, p. 80). In school, strong relationships are associated with more positive outcomes (Quin, 2017). Research suggests that teachers and students in an asynchronous classroom face unique obstacles in forming solid relationships due to fewer face-to-face interactions (Kebtritchi et al., 2017). Specifically, an asynchronous classroom limits an instructor's ability to gauge students' sense of belonging and sense of community (Vrasidas & Zembylas, 2004; Mazza & Milani, 2005; Mazzolini & Maddison, 2007).

Meanwhile, experiencing a classroom community may be more crucial to some students than to others (Graff, 2003). Graff, 2003, found that a student's cognitive style significantly influenced their overall sense of community. Online learning was more comfortable for analytical students than intuitive students. Intuitive cognitive styles seek out interaction and

closeness with others, possibly explaining why intuitive students report lower scores for a sense of community than analytics in the same environment (Graff, 2003). Furthermore, females tend to score higher than males in interaction and may report a stronger sense of community than males in an online environment conducive to solid relationships (Graff, 2003; Rovai, 2001). A 2022 study by Lowenthal and Trespalacios found that a strong classroom community is not dependent on every student in the class feeling connected. “Some participants simply have no interest in developing a sense of classroom community with a bunch of strangers, regardless of the format” (Lowenthal & Trespalacios, 2022, pg. 66). Students who choose not to fully participate in the classroom community, whether in person or online, may have other sources that meet their needs for belonging and community outside of the school or classroom (Lowenthal & Trespalacios, 2022).

Summary

This literature review focused on asynchronous online learning and its impact on the educational landscape. We explored the history of online education, and the various formats and platforms used to deliver remote instruction to K-12 students. Research provided guidance for best practices concerning asynchronous online instruction and structures for online course design. Instructors play a vital role in course design and fostering a sense of classroom community. Enrollment data suggests that participation and enrollment in K-12 online learning continue to increase. The increasing growth of online learning for K-12 students has caused education stakeholders to seek research-based instructional practices, online course design, and sound educational pedagogy (Arghobe et al., 2017). While online learning is not ideal for all students, many thrive in an online learning environment. Furthermore, research has shown that

creating an online learning environment where students have strong feelings of connectedness and community is possible and maximizes student outcomes.

While K-12 online education has existed for more than twenty years, there are still many gaps in the research on K-12 online learning. Post-secondary students and adults have frequently been the subjects of research studies in the field. Additionally, K-12 researchers have drawn conflicting conclusions when comparing virtual and brick-and-mortar learning outcomes (Simmons, 2022). One consideration is that many studies on K-12 online learning do not separate district-operated virtual schools from charter-operated programs or programs run by for-profit EMOs.

The conceptual framework for this study emphasizes the importance of connectedness, learning, and classroom community in all educational settings. When students experience high levels of connectedness and learning they have the greatest chance to reach their full potential to contribute and play a positive role in the classroom community. By examining the relationship between independent variables and students' sense of connectedness, learning, and classroom community, education stakeholders and policymakers can strengthen the online learning environments they provide for high school students.

Chapter 3: Methods

Introduction

This study examined students' reported sense of connectedness to the classroom community and its relationship with student demographics, class attendance, and academic performance. To investigate these relationships, the empirical study addressed four research questions:

- (1) What degree of connectedness to classroom community do students report in the three different educational settings?
- (2) Are there differences in student-reported connectedness based on student characteristics and educational setting?
- (3) Is there a relationship between student-reported connectedness and the number of days students are absent from school?
- (4) Is there a relationship between student-reported connectedness and performance in their courses?

Research Design

The study used a cross-sectional survey research design based on administrative student survey data. The intent was to understand the factors influencing students' experiences with their classroom communities. The quantitative data represented student perceptions and the analysis described the differences in perceptions of classroom connectedness and the relationship between perceptions and other student factors.

The study utilized a deidentified administrative dataset from a central Oklahoma suburban public high school offering full-time online, blended, and in-person coursework. The school district initially collected the data using an online survey based on Rovai's Classroom

Community Scale (CCS) (Rovai, 2002b). A cross-sectional survey was the ideal method to collect a snapshot of student opinions due to the design economy and the rapid return of responses (Creswell & Creswell, 2018). Additionally, Likert-type scales are commonly used in educational research surveys (Sullivan & Artino, 2013).

The high school in this study is in its fourth year of offering full-time and blended online learning opportunities. Students have the option to choose online courses for any of the classes required for graduation. The online courses are provided asynchronously with resources available on both an LMS and a CMS. Students can check out devices and hotspots if they lack access. All online classes are taught by a certified teacher who is certified in the subject area of the courses they teach. Online instructors receive an extra duty stipend to teach asynchronous online classes in addition to their regular schedule of in-person courses. Therefore, all the instructors are district employees, and courses are not outsourced to an online service provider. Additionally, the teachers volunteered to teach the online courses and were not compelled or placed in a virtual schedule mandatorily. Furthermore, students self-selected to take online or face-to-face classes and were not forced into a particular classroom setting due to extenuating circumstances.

This high school operates a regulated virtual education program within its public-school system. All students can participate in sports, drama, band, and other extra-curricular activities held by the Oklahoma Secondary School Activities Association (OSSAA). All courses are provided on an accelerated block schedule in which students are enrolled in four classes each semester and a total of eight courses per year. Using an accelerated or 4 x 4 block schedule limits the number of classes a student takes at any one time to allow a more in-depth study and specialization of the content subject matter before transitioning to a new set of classes (Salas,

2022). Hackney (2013) says, “The extended class periods allow students to move from being passive participants in teacher-dominated classrooms to active learners where teachers serve as facilitators” (p. 17). In-person classes meet for 90 minutes daily. Online courses have assignments released each week, and students must submit the coursework consistently each week.

Population

The population for this study included high school students in grades nine through twelve. Students ranged from fourteen to twenty years old. When the survey was given, the total population of the high school was $N = 1782$. The number of male students was 904, or 50.7% of the population, and the number of female students was 878, or 49.3%. Ninth-grade students numbered 479, or 26.9% of the student body. There were 457 tenth-grade students, or 25.6% of the population. Eleventh-grade students numbered 461, or 25.9% of the student body. Twelfth-grade students numbered 385, or 21.6% of total students. The student ethnicity of the population reflected white, 1116 or 62.6%; Hispanic, 149 or 8.4%; Black or African American, 151 or 8.5%; American Indian or Alaska Native, 75 or 4.2%; Native Hawaiian or Other Pacific Islander, 3 or 0.2%; Two or more races, 268 or 15%. The total student enrollment was divided into three educational settings: full-time online, 68 students or 3.8%; full-time in person, 1,518 students or 85.2%; and blended online and in-person, 196 or 11%.

Sample

The preexisting dataset included 830 voluntary responses (n) to a survey provided to a population (N) of 1782 ninth through twelfth-grade students. The data were deidentified to maintain student anonymity and confidentiality. The survey occurred in November after students and instructors had been together for over 60 instructional days and had a response rate of

46.6%. The timing of the study allowed students and instructors time to get to know each other and form bonds of classroom community and student connectedness.

Instrumentation

The school district collected data for this study using an online survey containing 26 data points organized into nine questions. The first question had 18 Likert-scale statements based on Rovai's Classroom Community Scale (CCS) (Rovai, 2002b). The CCS is a self-report, Likert-scale instrument. Alfred Rovai's Sense of Community Survey is the most widely used instrument for measuring classroom community. It has been used in several settings to measure the sense of community among virtual students (Ahmady et al., 2018). Rovai began researching the differences between traditional classroom experiences and asynchronous online classes in the early 2000s. In a 2023 synthesis of Rovai's research, Lowenthal and other authors claim that "Rovai's definition of classroom community and his instruments to measure classroom community have been used or influenced the majority of research conducted to date on community and online learning" (p. 2).

The first instrument he developed to measure classroom community, The Sense of Classroom Community Index (SCCI), was created in 2001 with ten questions from each of McMillan and Chavis' 1996 dimensions of community: spirit, trust, trade/interaction, and art/learning. This questionnaire contained 40 Likert-style questions with five potential responses: (4) strongly agree, (3) agree, (2) neutral, (1) disagree, and (0) strongly disagree.

By 2002, Rovai had adapted the SCCI to create the Classroom Community Scale (CCS). The CCS is a 20-question, self-report, Likert scale survey. The CCS is the most popular of Rovai's surveys (Lowenthal et al., 2023). It has been widely used to measure classroom community with virtual students in various settings (Ahmady et al., 2018). The Classroom

Community Scale (CCS) consists of ten items related to feelings of connectedness and ten items related to learning. Connectedness comprises the subscales of spirit and trust, while learning is reflected using the subscales of trade/interaction and art/learning. Rovai's CCS survey helped frame the survey used in our study. The data set for this study included student responses to the questions listed in Table 4.

Table 4

Survey Items Used in This Study

Question 1: Please select the response (Strongly Disagree, Disagree, Agree, or Strongly Agree) that best reflects how you feel about the academic courses you are taking this school year.

- CC1. Students in my courses care about each other
- CC2. I am encouraged to ask questions
- CC3. It is hard to get help when I have questions
- CC4. I do not feel a sense of community
- CC5. I receive timely feedback in my courses
- CC6. I feel uneasy exposing gaps in my understanding
- CC7. I feel isolated and alone in my courses
- CC8. I feel reluctant to speak or ask questions
- CC9. I trust my teachers and classmates
- CC10. My courses result in only modest learning
- CC11. I can rely on others in my courses to help me
- CC12. I feel other students do not help me learn
- CC13. I feel members of my courses depend on me
- CC14. I am given ample opportunities to learn
- CC15. I feel that my teachers care about me
- CC16. My educational needs are not being met
- CC17. There are resources available if I need help
- CC18. My courses do not promote a desire to learn

Question 2: Please select the gender that you identify with.

Question 3: Please select the racial group you identify with.

Question 4: Please select your current grade level.

Question 5: Please select the educational setting in which you are currently enrolled.

Question 6: Please select the number of days you have been absent so far this school year.

Question 7: Which of the following best describes your current grades?

Question 8: If you were to choose to take an online class during high school, which of the following would most likely reflect your reason?

Question 9: If you have taken an online course through the high school, please rate your overall experience. If you have not taken an online class, please mark not applicable.

Following each item in question one was a four-point Likert scale of potential responses: strongly disagree, disagree, agree, strongly agree. Participants selected the response that best reflected their feelings about the item. Nine items (item numbers 1, 2, 5, 9, 11, 13, 14, 15, 17) were stated positively; therefore, the following scoring scale was used: strongly agree = 4, agree = 3, disagree = 2, strongly disagree = 1. Nine items (item numbers 3, 4, 6, 7, 8, 10, 12, 16, 18) were stated negatively; therefore, the items were reverse-scored to allow the most favorable response to maintain the highest value so the following score scale was used: strongly disagree = 4, disagree = 3, agree = 2, and strongly agree = 1. Students who responded with scores of 3 or 4 were considered to have responded positively to each item.

Items 1, 4, 7, 9, 11, 13, 15, and 17 were averaged to calculate the connectedness subscore. Means were analyzed to ensure cut scores reflected positive results. A mean value of 3 or above reflects positive results. Item numbers 2, 3, 5, 6, 8, 10, 12, 14, 16, and 18 were averaged to calculate the learning subscore. Similarly, a mean value of 3 or above reflects positive results. The average of all 18 items was used to calculate the overall classroom community score. Consequently, mean values higher than 3 reflect a stronger sense of classroom community.

The instrument also included questions about student characteristics. Students were asked to identify their gender (e.g., male, female, nonbinary/third-gender, prefer not to say), their race and ethnicity (e.g., Hispanic or Latino/a, Black or African American, American Indian or Alaskan Native, Asian, White, Native Hawaiian or Other Pacific Islander, two or more races), and their grade level (e.g., 9th, 10th, 11th or 12th grade). In addition to student characteristics, the instrument asked students to select their educational setting (e.g., face-to-face classes only, online classes only, a blend of online and face-to-face classes) to choose the number of days they had been absent (e.g., zero, one or two days, three or four days, five or more days), to identify

their current academic grades (e.g., all As, As and Bs, I have at least one C, I have at least one D or F). Finally, students were asked to select the primary reason for taking an online course (e.g., the online class allowed me to take a course that was not offered in person; the online class removed scheduling barriers such as work schedule, family responsibilities, travel, or other scheduling concerns; the online class removed physical barriers such as transportation, health concerns, or other physical concerns; the online class allowed me greater control over my learning environment (less distractions, control the pace of learning, or go back over material if needed); I would never choose an online course), and rate their overall experience with online classes.

Data Analysis

The analysis used the Statistical Package for Social Sciences (SPSS) IBM Software Version 29 to provide descriptive statistics, frequency tables, analysis of variance, and multiple regression. Descriptive statistics were provided for the independent and dependent variables in the study, including the measures of central tendency and standard deviations. The data distribution was checked for normal distribution, skewness, and kurtosis. This allowed parametric tests such as analysis of variance (ANOVA) and multiple regression to be conducted (Jamieson, 2004). Since the study grouped survey items to calculate the connectedness subscore, learning subscore, and classroom community score, Cronbach's Alpha was calculated to measure that the items were appropriately grouped to measure the underlying variable (Allen & Seaman, 2007; Sullivan & Artino, 2013). Cronbach's Alpha was .87 for the classroom community score, indicating high internal consistency and reliability. Cronbach's Alpha for items in the connectedness subscale was .81, and for the learning subscale, it was .77, indicating high internal consistency and reliability.

Limitations

The number of students who responded to the survey was less than half of the student body. Additionally, the number of full-time online participants was limited, representing only 11 out of the 60 students enrolled in this educational setting or 18.3%; therefore, the sample may not represent the larger population of full-time virtual students. Because the current study only examined one semester, the data may only partially capture the dynamic nature of student connectedness. Future studies might take a longitudinal approach to capture how classroom connectedness changes throughout students' high school experience.

Additionally, students self-reported; therefore, their subjective opinions may have been prone to bias, and results may be based more on students' opinions than facts. The ability to generalize findings beyond the present study is limited because only one high school was sampled. Many other variables influence students' sense of connectedness and learning, such as specific instructors' teaching styles, course design and content, and pedagogy. Future research could study pedagogy for online learning and best practices for online course design and facilitation.

Summary

Chapter three outlines the methods used to study connectedness and the overall sense of classroom community in high school courses. It discusses the research questions, design, population, sampling procedures, and data analysis. Chapter four includes detailed statistical results. The last chapter discusses the findings and implications of the results.

Chapter 4: Results

This chapter presents evidence organized by the four research questions. For the first research question, descriptive data are reported for the composite classroom community score and for the dimensions of connectedness and learning. Additionally, an item-level analysis provides a snapshot of students' perceptions of each survey item disaggregated by educational setting (e.g., online, face-to-face, and blended). ANOVA results further demonstrate the relationship between educational setting and classroom community. For the second research question, mean differences in classroom community are reported by the student characteristics of gender, race, and grade level. ANOVA results report the statistical significance of mean differences. Multiple regression results are used for the third and fourth research questions to determine the effect of attendance and course grades on student connectedness to the classroom community.

Research question 1: What degree of connectedness to classroom community do students report in the three different educational settings?

The connectedness and learning survey items were compiled and averaged to create subscores and collectively averaged to create the overall classroom community score. Table 5 provides the minimum, maximum, mean, and standard deviation for the three categories of connectedness to classroom community. The average connectedness score ($M = 2.67$), learning score ($M = 2.69$), and classroom community score ($M = 2.68$) were below the mean cut score of 3, indicating that students as a collective did not achieve the standard set for experiencing classroom connectedness.

Next, the descriptive statistics for connectedness, learning, and classroom community were disaggregated by educational setting, as displayed in Table 6. The blended learning

educational setting had the highest mean results in all three scales: connectedness ($M = 2.68$), learning ($M = 2.72$), and classroom community ($M = 2.70$). The face-to-face only setting produced the second highest results in all three scales: connectedness ($M = 2.67$), learning ($M = 2.69$), and classroom community ($M = 2.68$). Meanwhile, the online-only setting produced the lowest mean results in all three scales: connectedness ($M = 2.36$), learning ($M = 2.47$), and classroom community ($M = 2.44$).

Table 5

Composite Values of Classroom Connectedness

	Min	Max	Mean	SD
Connectedness	1	4	2.67	0.50
Learning	1	3.8	2.69	0.43
Classroom Community	1	3.78	2.68	0.42

Note. The mean cut score for connectedness, learning, and classroom community is 3.

Table 6

Descriptive Statistics for Classroom Connectedness Disaggregated by Educational Setting

Survey Items	Online only		Face-to-face only		Blended	
	Mean	SD	Mean	SD	Mean	SD
Connectedness	2.36	.58	2.67	.50	2.68	.49
Learning	2.47	.41	2.69	.43	2.72	.44
Classroom Community	2.44	.48	2.68	.42	2.70	.43

Note. The mean cut score for connectedness, learning, and classroom community is 3.

Table 7 reports the item-level responses to the survey from all students, disaggregated by educational setting, including the item means and the percentage of students who responded with

a 3 or 4 to the survey question. Most survey items elicited a positive response from face-to-face and blended students, with two exceptions. In question 10, only 44.2% of face-to-face students and 44.3% of blended students strongly disagreed or disagreed with the statement, “I feel my courses result in only modest learning.” Also, on question 13, “I feel that members of my courses depend on me,” only 36.8% of face-to-face students and 34.7% of blended students strongly agreed or agreed. In contrast, eight of the survey questions were answered negatively by online only students, including questions 4, 6, 8, 9, 11, 12, 13, and 18. Most notably on question 13, “I feel that members of my courses depend on me,” 8.3% of online only students responded with a positive response. On question 11, “I can rely on others in my courses to help me,” only 25% of online students reported positively. Only 33.3% of online only students disagreed or strongly disagreed with question 8, “I feel reluctant to speak or ask questions.”

Face-to-face and blended students both marked questions 14, 15, and 17 with their highest positive responses. On question 14, 80.1% of face-to-face students and 79.8% of blended students agreed positively with the statement, “I feel that I am given ample opportunities to learn in my courses.” Meanwhile, on question 15, 78.3% of face-to-face students and 77.8% of blended students agreed positively with “I feel that my teachers care about me.” On question 17, 77.1% face-to-face and 76.5% of blended students agreed or strongly agreed that “There are resources available if I need help.” Likewise, there were three notable areas, questions 5, 10, and 17, where online only students responded with their highest positive results. On question 17, 66.7% of online only students agreed positively with the statement “There are resources available if I need help.” On question 10, 66.7% of online only students disagreed or strongly disagreed with “My courses result in only modest learning.” On question 5, 66.6% of online only students responded positively to “I receive timely feedback in my courses.”

Table 7*Item Means and Percentage of Positive Responses Disaggregated by Educational Setting*

Item	Face-to-face		Online		Blended	
	Mean	% positive responses	Mean	% positive responses	Mean	% positive responses
1. Students in my courses care about each other	2.54	56.6%	2.25	50%	2.65	64.9%
2. I am encouraged to ask questions	2.79	74.1%	2.58	58.3%	2.84	74.7%
3. It is hard to get help when I have questions	2.88	75.8%	2.75	58.4%	2.79	69.0%
4. I do not feel a sense of community	2.69	65.8%	2.25	41.6%	2.65	69.0%
5. I receive timely feedback in my courses	2.69	68.5%	2.67	66.6%	2.77	75.5%
6. I feel uneasy exposing gaps in my understanding	2.51	54.1%	2.25	41.7%	2.59	57.8%
7. I feel isolated and alone in my courses	2.82	71.9%	2.67	58.3%	2.92	75.5%
8. I feel reluctant to speak or ask questions	2.56	55.1%	2.33	33.3%	2.68	63.2%
9. I trust my teachers and classmates	2.67	66.8%	2.45	45.5%	2.77	71.7%
10. My courses result in only modest learning	2.43	44.2%	2.67	66.7%	2.42	44.3%
11. I can rely on others in my courses to help me	2.69	67.4%	1.92	25%	2.59	62.2%
12. I feel other students do not help me learn	2.62	61.4%	2.17	41.7%	2.63	63.9%
13. I feel members of my courses depend on me	2.27	36.8%	1.75	8.3%	2.27	34.7%
14. I am given ample opportunities to learn	2.87	80.1%	2.67	58.3%	2.86	79.8%
15. I feel that my teachers care about me	2.89	78.3%	2.58	58.3%	2.93	77.8%
16. My educational needs are not being met	2.83	74.5%	2.42	50%	2.80	72.7%
17. There are resources available if I need help	2.86	77.1%	2.67	66.7%	2.78	76.5%
18. My courses do not promote a desire to learn	2.78	70.8%	2.17	41.7%	2.82	72.7%

Note. The mean cut score for connectedness, learning, and classroom community is 3.

A one-way ANOVA was conducted on classroom community with online and blended students as one group and in person students as the other group. Table 8 shows the results between educational setting and classroom community which revealed no statistically significant differences between online/blended students and in person students $F(1, 174) = 0.06, p = 0.814$. Students in these two educational settings reported similar levels of connectedness to classroom community.

Table 8

ANOVA Results for Classroom Community Between Educational Settings

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.010	1	.010	.055	.814
Within Groups	128.804	714	.180		
Total	128.814	715			

Research question 2: Are there differences in student-reported connectedness based on student characteristics and educational setting?

Three student characteristics were analyzed: gender, race, and grade level to determine if patterns emerged in student-reported connectedness. Table 9 shows the descriptive statistics of student-reported connectedness, learning, and classroom community organized by gender. Nonbinary/third-gender students reported the lowest mean levels of connectedness ($M = 2.29$), learning ($M = 2.42$), and classroom community ($M = 2.36$). Students who preferred not to indicate a gender showed the second lowest levels with means of 2.39, 2.48, and 2.44, respectively. Females reported slightly higher scores in connectedness ($M = 2.71$) than males ($M = 2.69$). However, males reported higher scores in learning ($M = 2.73$) than females ($M = 2.69$), and in classroom community, males ($M = 2.70$) and females ($M = 2.69$).

Table 9*Descriptive Statistics for Classroom Connectedness Disaggregated by Gender*

Grade-level	Connectedness		Learning		Classroom Community	
	Mean	SD	Mean	SD	Mean	SD
9 th	2.73	.47	2.72	.40	2.72	.39
10 th	2.61	.53	2.65	.48	2.63	.46
11 th	2.70	.46	2.71	.42	2.70	.40
12 th	2.60	.57	2.63	.45	2.61	.45

Note. The mean cut scores for connectedness, learning, and classroom community are 3.

A two-way ANOVA was performed to evaluate the effects of gender and educational setting on classroom community scores. For educational setting, online and blended students were combined into one group and in person students were a second group. The means and standard deviations for classroom community are presented in Table 10. Males and females in the in person setting reported higher levels of classroom connectedness than males and females in the online and blended settings. Meanwhile, non-binary/third gender students and students who preferred not to say their gender reported higher levels of classroom connectedness in online and blended settings compared to their peers in the in person setting.

The results of the ANOVA, in Table 11 below, indicated no significant main effect for gender, $F(3, 706) = 1.36, p = .253$; no significant main effect for educational setting, $F(1, 706) = 2.80, p = .095$; and no significant interaction effect between gender and educational setting, $F(3, 706) = 1.54, p = .203$.

Table 10

Descriptive Statistics for Classroom Connectedness Disaggregated by Gender and Educational Setting

Educational Setting	Gender	Mean	Standard Deviation
Online/ Blended	Male	2.680	.458
	Female	2.675	.425
	Non-binary/third gender	2.944	.157
	Prefer not to say	2.486	.448
In Person	Male	2.706	.414
	Female	2.693	.404
	Non-binary/third gender	2.293	.637
	Prefer not to say	2.429	.367

Table 11

ANOVA Results of Gender and Educational Setting on Classroom Community

CC	Sum of Squares	df	Mean Square	F	Sig.
Gender	.716	3	.239	1.36	.253
Ed Setting	.490	1	.490	2.80	.095
Gender*Ed_Setting	.810	3	.270	1.54	.203
Error	123.65	706	.175		
Total	5247.09	714			

Table 12 displays the descriptive statistics for connectedness, learning, and classroom community disaggregated by race. The highest mean score in classroom community occurred among Asian students ($M = 2.87$). These scores were followed by American Indian/Alaska Native students ($M = 2.73$), then Black/African American ($M = 2.70$) and White students ($M = 2.69$). The lowest mean scores occurred with Native Hawaiian/ Pacific Islander students;

however, these results are minimized since this population had an n-value of only two students.

The second lowest results occurred with Hispanic or Latino students ($M = 2.58$).

Table 12

Descriptive Statistics for Classroom Connectedness Disaggregated by Race

Race	Connectedness		Learning		Classroom Community	
	Mean	SD	Mean	SD	Mean	SD
Hispanic or Latino/a	2.59	.47	2.58	.43	2.58	.42
Black/African American	2.70	.46	2.71	.40	2.70	.37
American Indian/Alaska Native	2.73	.45	2.74	.45	2.73	.47
Asian	2.89	.34	2.86	.30	2.87	.27
White	2.69	.50	2.70	.44	2.69	.43
Native Hawaiian/Pacific Islander	2.31	1.15	2.67	.31	2.42	.59
Two or more races	2.59	.55	2.65	.44	2.62	.44

Note. The mean cut scores for connectedness, learning, and classroom community are 3.

A two-way ANOVA was performed to evaluate the effects of race and educational setting on classroom community scores. For educational setting, online and blended students were combined into one group and in person students were a second group. The means and standard deviations for classroom community are presented in Table 13. In the online/blended setting, American Indian/Alaska Native students reported the highest level of classroom connectedness. In fact, this group was the only group to reach the threshold mean cut score of 3 with a mean value of 3.01. Hispanic/Latino(a) students were the second highest group in the online/blended setting ($M = 2.77$), however, they were the second lowest group in the in person setting ($M = 2.53$). Asian students reported the lowest scores in the online/blended setting ($M =$

2.39) while boasting the highest scores in the in person setting ($M = 2.90$). In person students from the Black/African American race reported the second highest levels of connectedness for the in person educational setting.

Table 13

Descriptive Statistics for Classroom Connectedness Disaggregated by Race and Educational Setting

Educational Setting	Race	Mean	Standard Deviation
Online/ Blended	Hispanic or Latino/a	2.77	.40
	Black/African American	2.61	.45
	American Indian/Alaska Native	3.01	.15
	Asian	2.39	-
	White	2.68	.44
	Native Hawaiian/Pacific Islander	-	-
	Two or more races	2.56	.50
In Person	Hispanic or Latino/a	2.53	.42
	Black/African American	2.71	.37
	American Indian/Alaska Native	2.69	.49
	Asian	2.90	.25
	White	2.69	.43
	Native Hawaiian/Pacific Islander	2.42	.59
	Two or more races	2.63	.43

The results of the two-way ANOVA to evaluate the effects of race and educational setting on classroom community scores are given below in Table 14. The results indicated no significant main effect for race, $F(6, 698) = 0.93$, $p = .472$; no significant main effect for educational setting, $F(1, 698) = 0.05$, $p = .821$; and no significant interaction effect between race and educational setting, $F(5, 698) = 1.20$, $p = .306$.

Table 14*ANOVA Results of Race and Educational Setting on Classroom Community*

CC	Sum of Squares	df	Mean Square	F	Sig.
Race	1.005	6	.168	0.93	.472
Ed Setting	.009	1	.009	0.05	.821
Race*Ed_Setting	1.082	5	.216	1.20	.306
Error	125.62	698	.180		
Total	5228.05	711			

Table 15 displays the descriptive statistics for connectedness, learning, and classroom community disaggregated by grade level. Overall, students in the 9th grade reported the highest levels of connectedness ($M = 2.73$), learning ($M = 2.72$), and classroom community ($M = 2.72$). Meanwhile, students in the 12th grade reported the lowest levels of connectedness ($M = 2.60$), learning (2.63), and classroom community (2.61).

Table 15*Descriptive Statistics for Classroom Connectedness Disaggregated by Grade Level*

Grade-level	Connectedness		Learning		Classroom Community	
	Mean	SD	Mean	SD	Mean	SD
9 th	2.73	.47	2.72	.40	2.72	.39
10 th	2.61	.53	2.65	.48	2.63	.46
11 th	2.70	.46	2.71	.42	2.70	.40
12 th	2.60	.57	2.63	.45	2.61	.45

Note. The mean cut scores for connectedness, learning, and classroom community are 3.

A two-way ANOVA was performed to evaluate the effects of grade level and educational setting on classroom community scores. For educational setting, online and blended students

were combined into one group and in person students were a second group. The means and standard deviations for classroom community are presented in Table 16. Online/blended student in the 11th grade reported the highest levels of classroom community ($M = 2.77$), followed by 12th grade students ($M = 2.61$), 9th grade students ($M = 2.57$), and 10th grade students ($M = 2.48$). In person students in the 9th grade reported the highest levels of classroom community ($M = 2.73$), followed by 11th grade students ($M = 2.68$), 10th grade students ($M = 2.64$), and 12th grade students ($M = 2.61$).

Table 16

Descriptive Statistics for Classroom Connectedness Disaggregated by Grade Level and Educational Setting

Educational Setting	Grade Level	Mean	Standard Deviation
Online/ Blended	9th	2.57	.431
	10th	2.48	.504
	11th	2.77	.369
	12th	2.61	.502
In Person	9th	2.73	.391
	10th	2.64	.459
	11th	2.68	.414
	12th	2.61	.428

The results of the ANOVA, in Table 17 below, indicated no significant main effect for grade level, $F(3, 707) = 2.20$, $p = .086$; no significant main effect for educational setting, $F(1, 707) = 1.005$, $p = .316$; and no significant interaction effect between grade level and educational setting, $F(3, 707) = 1.56$, $p = .199$.

Table 17*ANOVA Results of Grade Level and Educational Setting on Classroom Community*

CC	Sum of Squares	df	Mean Square	F	Sig.
Grade Level	1.185	3	.395	2.20	.086
Ed Setting	.180	1	.180	1.01	.316
Grade_Level*Ed_Setting	.836	3	.279	1.56	.199
Error	126.692	707	.179		
Total	5251.522	715			

Research question 3: Is there a relationship between student-reported connectedness and the number of days students are absent from school?

Table 18 shows the descriptive statistics for the number of days students reported being absent. Students with the highest number of absences (5 or more) had the lowest average scores for connectedness ($M = 2.57$), learning ($M = 2.625$), and the composite classroom connectedness ($M = 2.58$). Students with no absences had the highest average scores for connectedness ($M = 2.71$), learning ($M = 2.77$), and the composite classroom connectedness ($M = 2.75$).

Table 18*Descriptive Statistics for Classroom Connectedness Disaggregated by Number of Days Absent*

Days	Connectedness		Learning		Classroom Community	
	Mean	SD	Mean	SD	Mean	SD
Zero days	2.71	.50	2.77	.40	2.75	.41
One or two days	2.73	.46	2.74	.40	2.74	.38
Three or four days	2.67	.48	2.634	.44	2.64	.42
Five or more days	2.57	.58	2.625	.48	2.58	.48

Note. The mean cut scores for connectedness, learning, and classroom community are 3.

A multiple regression was used to test if the number of days absent, controlling for gender, race, educational setting, and grade level, predicted participants' classroom community.

Table 19 shows the variance results. Table 20 presents the regression results.

Table 19

Variance Results for Classroom Community

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.186	.035	.028	.41852

Table 20

Regression Results for Classroom Community

Model 1	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	b	Std. Error	Beta		
(Constant)	3.015	.096		31.277	< .001
Days absent	-.058	.016	-.138	-3.709	< .001
Gender	-.064	.023	-.105	-2.821	.005
Race	-.004	.010	-.013	-.347	.729
Grade Level	-.368	.293	-.049	-1.256	.209
Educational Setting	-.017	.016	-.041	-1.051	.294

The regression results indicated that approximately 3.5% of the variance in classroom community was explained by the independent variables ($R^2 = .035$, $F(5, 703) = 5.061$, $p < .001$).

Days absent and gender were the only variables with a statistically significant relationship with classroom community. The number of days students were absent had a statistically significant negative relationship with classroom community ($\beta = -.138$, $p < .001$), indicating the students with more absences reported less classroom community. Gender also had a statistically

significant negative relationship with classroom community ($\beta = -.105$, $p < .05$), indicating that non-binary/third gender students reported less connectedness than males and females. Overall, as the number of days absent increased, the mean scores for connectedness, learning, and classroom community decreased.

On another note of interest, students in online and blended courses missed more school than their face-to-face peers. Table 21 is a frequency table comparing the number of days students reported being absent based on their education setting. The percentage of students in online and blended courses who reported missing five or more days of school was 28.2% compared to their face-to-face peers with 23.2%. The percentage of students with perfect attendance was 11.8% for online/blended students and 16% for face-to-face students.

Table 21

Frequency of Absences Based on Education Setting

<i>Days absent</i>	<i>Face-to face</i>	<i>Online/Blended</i>
<i>Zero days</i>	<i>16.0</i>	<i>11.8</i>
<i>One or two days</i>	<i>32.9</i>	<i>35.5</i>
<i>Three or four days</i>	<i>27.9</i>	<i>24.5</i>
<i>Five or more days</i>	<i>23.2</i>	<i>28.2</i>

Research question 4: Is there a relationship between student-reported connectedness and performance in their courses?

Table 22 shows the descriptive statistics organized by current course grades. Students with at least one D or F reported the lowest mean scores in all three categories, with scores of 2.55, 2.53, and 2.52. Students with all A's reported the highest mean scores in all three

categories, with scores of 2.73, 2.76, and 2.74. Overall, the mean scores for connectedness, learning, and classroom community decreased as students' grades decreased.

Table 22

Descriptive Statistics for Connectedness Disaggregated by Current Course Grades

Course grades	Connectedness		Learning		Classroom Community	
	Mean	SD	Mean	SD	Mean	SD
All As	2.73	.48	2.76	.45	2.74	.43
As and Bs	2.68	.48	2.70	.37	2.69	.38
At least one C	2.61	.52	2.64	.48	2.63	.46
At least one D or F	2.55	.54	2.53	.44	2.52	.43

Note. The mean cut scores for connectedness, learning, and classroom community are 3.

A multiple regression was run to predict classroom community scores from student reported course grades, controlling for gender, race, educational setting, grade level, and number of days absent. Table 23 shows the variance results. Table 24 presents the regression results. The results of the regression indicated that the independent variables explained 5.9% of the variance in classroom community ($R^2 = .059$, $F(6, 702) = 7.305$, $p < .001$). The course grades students reported significantly predicted classroom community ($\beta = -.160$, $p < .001$), as did gender ($\beta = -.116$, $p = .002$) and days absent ($\beta = -.102$, $p = .007$). The multiple regression analysis shows a negative, linear relationship between the course grades students report and students' sense of connectedness, learning, and classroom community. Overall, as student's grades in the course decreased, so did their mean scores for connectedness, learning, and classroom community.

Table 23*Variance Results for Classroom Community*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.242	.059	.051	.41358

Table 24*Regression Results for Classroom Community*

Model 1	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	b	Std. Error	Beta		
(Constant)	3.121	.099		31.682	< .001
Gender	-.071	.023	-.116	-3.136	.002
Race	-.004	.010	-.014	-.389	.698
Grade Level	-.020	.016	-.049	-1.274	.203
Educational Setting	-.023	.047	-.019	-.496	.620
Days absent	-.043	.016	-.102	-2.691	.007
Course grades	-.064	.015	-.160	-4.233	< .001

Furthermore, students in online and blended courses reported higher course grades than their face-to-face peers. Table 25 is a frequency table comparing the course grades students reported based on their education setting. The percentage of students in online and blended courses who reported having all As was 43.6% compared to their face-to-face peers with 39.2%. The percentage of students with at least one D or F was 10.0% for online/blended students and 13.9% for face-to-face students.

Table 25*Frequency of Course Grades Based on Education Setting*

<i>Course grades</i>	<i>Face-to face</i>	<i>Online/Blended</i>
<i>All A's</i>	<i>39.2</i>	<i>43.6</i>
<i>A's and B's</i>	<i>31.1</i>	<i>32.7</i>
<i>At least one C</i>	<i>15.8</i>	<i>13.6</i>
<i>At least one D or F</i>	<i>13.9</i>	<i>10.0</i>

Summary

Overall, none of the three educational settings achieved the standard set for experiencing classroom community. However, the main findings of the study demonstrate that online-only students feel less connected than their peers in face-to-face and blended learning environments. Online only students showed the lowest degree of connectedness, learning, and classroom community. Students in a blended learning environment showed the highest degree of connectedness. Furthermore, students in a face-to-face learning environment had scores between their online and blended peers.

Based on the student characteristics of gender, race, and grade level, no statistically significant differences in mean values occurred for classroom community. Nonbinary/third-gender students had the lowest levels of connectedness in the face-to-face setting, however they maintained the highest levels of connectedness in the online/blended educational setting. Females scored higher than males in the online/blended setting, while males had the highest level of connectedness in the face-to-face environment. Classroom connectedness varied by race when educational setting was also considered. Asian, Black/African American, White, and American Indian/Alaska Native had the highest levels of connectedness in the in person setting. Meanwhile, American Indian/ Alaska Native, Hispanic or Latino/a, and White students reported

the highest levels of connectedness in the online/blended setting. Eleventh grade students had the highest level of connectedness in the online/blended setting, while ninth grade students scored highest in the in person setting.

When comparing student connectedness and the number of days students reported being absent, there was a negative, statistically significant relationship between the number of days students reported being absent from school and students' sense of connectedness, learning, and classroom community. As the number of days students reported being absent increased, the levels of classroom community decreased. Students missing between zero and two school days had the highest mean scores in all three categories. Meanwhile students with five or more absences reported the lowest mean scores in all three categories. Additionally, online and blended students in this survey reported missing more school than their face-to-face peers.

When comparing student connectedness and course grades, there was a negative, statistically significant relationship between connectedness and course grades showing that as students' grades decreased, so did their mean scores for connectedness, learning, and classroom community. Students with all A's reported the highest mean results and students with at least one D or F reported the lowest mean results. Overall, online and blended students in this survey reported higher course grades than their face-to-face peers.

Chapter 5: Discussion

This study was designed to address a large knowledge gap regarding students' classroom connectedness in a suburban high school with online, blended, and face-to-face learning options. The primary purpose was to examine differences in students' self-reported classroom connectedness in online and in person courses. A second purpose was to determine if there were differences in classroom connectedness based on student characteristics like gender, race, or grade level. A third purpose was to test the relationship between attendance, academic performance, and classroom connectedness.

The results of this study lead to three claims about student connectedness that have implications for educational stakeholders. Claim 1: Online-only students are less connected than their peers enrolled in blended and face-to-face-only settings. Claim 2: Vulnerable student populations may need additional support to feel connected to their classroom community. Claim 3: Attendance and course grades influence students' feelings of connectedness to the classroom community. These claims are supported by data from this study and situated in the context of existing literature.

Claim 1: Online-only students are less connected than their peers enrolled in blended and face-to-face-only settings.

While none of the educational settings achieved the standard set for experiencing classroom connectedness, the online-only education setting produced the lowest mean results when compared with students in the blended and face-to-face settings. Online only students responded negatively to eight of the eighteen Likert Scale survey items, while their face-to-face and blended peers responded negatively to only two of the survey items. Online only students responded negatively to four questions in the connectedness category (questions 4, 9, 11, and 13)

and four questions in the learning category (questions 6, 8, 12, and 18). Only 41.6% of online students reported feeling a sense of community and 45.5% reported trusting their teachers and classmates. Only 25% of online students felt they could rely on others in their courses to help them and 8.3% felt that members of their courses depended on them. Furthermore, online only students felt more uneasy exposing gaps in their understanding and felt reluctant to speak or ask questions than their peers. Online only students felt resolutely that other students did not help them learn and that their courses did not promote a desire to learn. Furthermore, online only students missed more school than their face-to-face peers as noted in Table 21. This could cause compounding effects between the negatives experienced with their educational setting and additional issues from missing school.

These findings align with other studies that found the asynchronous virtual classroom presents challenges in fostering a close and connected relational environment for some students (Booker, 2021; Martin, 2019; Quin, 2017). Attempting to foster connection and community in an online learning environment is particularly important due to the transactional distance between learners and their instructors (Boling et al., 2012). Education stakeholders must recognize and value the process of establishing a community within a K-12 virtual classroom and intentionally carve out time to prioritize its development (Johnson et al., 2023). Connecting to the online classroom community can increase student achievement and learner satisfaction (Borup et al., 2019; Whiteside, 2015).

Historically, instabilities have plagued K-12 online courses, including a general lack of student participation and academic progress (Darrow-Magras, 2015; Humber, 2018; Kebritchi et al., 2017). Subsequently, the online learning environment has continued to draw concerns from education stakeholders about its viability in meeting adolescents' social and emotional needs

(Arslan, 2018; Jamison & Bollinger, 2020). Experts have highlighted concerns about student isolation and the need for more opportunities in an online setting to interact with others (Arslan, 2021; Graff, 2003; Jamison & Bollinger, 2020). Online learning has the potential to perpetuate a lack of socialization and lack of community for some students (Simmons, 2022). Therefore, school leaders must consider the characteristics of online learners to ascertain if students' learning type, self-regulation, and motivation are conducive to learning online (Park & Shea, 2020).

Nevertheless, enrollment in online courses has continued to grow at an accelerated pace, and the online educational setting has proven to be a viable choice for an increasing number of students since its widespread use during the pandemic (Simmons, 2022). This experience allowed students an opportunity to sit in the driver's seat of their education and enjoy the freedom of self-managing and constructing their learning in asynchronous online courses (Simmons, 2022). While online students have more control over their learning environment and use of learning materials, they also have an additional responsibility to maintain a sense of self-motivation and self-direction and to actively participate in online courses (Gilbert, 2015; Kebritchi et al., 2017). Likewise, course designers and instructors must continue to seek fresh ways to humanize the online learning process and help students connect to the classroom community (Boling et al., 2012; Darius et al., 2021). Online students desire knowing that a genuine, caring person is working with them on the other side of the computer screen (Martin, 2019). It is increasingly vital to hire the right teachers to teach online courses.

Regardless of the educational setting, learning is the primary purpose of schooling and education leaders want students to experience success in whichever education setting they choose (Willermark & Island, 2022). Furthermore, school belonging is essential to adolescents'

emotional well-being (Arslan, 2018). During adolescence, school connectedness is a known protective factor for mental health, violence, sexual behavior, and substance abuse. (Sieving et al., 2017). Steiner et al. (2019) reported that school connectedness has long-lasting effects on positive health and well-being into adulthood. School leaders have a responsibility to focus on producing strong learning outcomes and student connectedness (Barbour et al., 2011). While each educational setting (online, blended, face-to-face) caters to different student learning behaviors and needs (Willermark & Islind, 2022), educational leaders must continue to balance the strengths and weaknesses of each unique educational setting and seek ways to increase student connectedness in online-only settings.

Online courses will remain an essential part of the larger educational environment. Such courses have the potential to enhance educational access and opportunities for students, but as the results in this study show, achieving this potential will require understanding how to cultivate strong student classroom connectedness. Teachers teaching online courses at the high school level have room for instructional growth, but so do teachers in the regular brick and mortar high school. To enhance student classroom connectedness, it will be important for educators to understand factors related to students feeling connected to others and to learning and how to cultivate these conditions.

Claim 2: Vulnerable student populations may need additional support to feel connected to their classroom community.

Patterns in the results of this study identified three potentially vulnerable populations of students: nonbinary/third-gender students, students with higher absentee rates, and students with at least one D or F. Nonbinary/third-gender students reported the lowest mean levels of all student populations in connectedness ($M = 2.29$), learning ($M = 2.42$), and classroom community

($M = 2.34$). Students with five or more absences, when compared to students with fewer absences, reported lower mean scores in all three connectedness categories, with scores of 2.55, 2.53, and 2.52, respectively. Furthermore, when compared to students with higher course grades, students with at least one D or F reported the lowest mean scores in all three categories.

Previous studies have tied student identity to motivation and engagement, essential factors in student connectedness and learning outcomes (Korpershoek et al., 2020). A recent study found that loneliness, lack of social and emotional support, stress, frequent mental distress, and depression were significantly higher among nonbinary/third-gender persons than among heterosexual and cisgender persons (Bruss et al., 2024). Moreover, in recent years, a growing number of youths have identified as nonbinary (De Coninck, D., & d’Haenens, 2023). Fox and Ralston (2016) reported that lesbian, gay, bisexual, transgender, and questioning (LGBTQ) students often avoid groups and refuse to engage in classes where they are unsure how their identity will be accepted. “LGBTQ youth have been found to retreat into digital environments to compensate for a lack of supportive face-to-face connections” (De Coninck, D., & d’Haenens, 2023, p. 36). The current study corroborates this idea as connectedness for nonbinary/third-gender students was higher in the online/blended educational setting ($M = 2.94$) than in the in person setting ($M = 2.29$). Nonbinary youth report significantly higher digital skills and online usage than both males and females of the same age (De Coninck, D., & d’Haenens, 2023). Developing a learning environment that is a safe place for relationship building and support can be beneficial for students who face gender disparities (Bruss et al., 2024).

In this study, 28.2% of online and blended students self-reported being absent five or more school days by early November. This was 5% higher than the 23.2% of face-to-face students reporting similar absences. These numbers were much higher when compared to a 2022

study of students in Maryland that found virtual students' attendance was about 0.6% less than their in-person peers (Simmons, 2022).

Compared with students with fewer absences, students with five or more absences reported lower mean scores in all three connectedness categories, with scores of 2.55, 2.53, and 2.52, respectively. Students missing between zero and two school days had the highest mean scores in all three categories of classroom connectedness. The multiple regression analysis on all students showed a negative, statistically significant relationship between the number of days students reported being absent from school and students' sense of connectedness, learning, and classroom community. Overall, as the number of days absent increased, the mean scores for connectedness, learning, and classroom community decreased.

Meanwhile, students in online and blended courses reported higher course grades than their peers in face-to-face courses. 76.3% of online and blended students reported course grades of As and Bs while only 70.3% of students in face-to-face courses reported course grades of As and Bs. These findings align with Simmons (2022) which found that about 10% more high school students in online only courses earned As than their in-person peers. Means et al. (2013) found that in 99 empirical studies online students performed at least as well as their peers in face-to-face courses. Moreover, online and blended students in this study reported 10% earning at least one D or F, while almost 14% of face-to-face students reported earning at least one D or F. These findings contradict previous research from Molnar et al., 2021, that found students in virtual programs underperform their brick-and-mortar counterparts.

Overall, the mean scores for connectedness, learning, and classroom community decreased as students' grades decreased. Compared with students with higher course grades,

students with at least one D or F reported the lowest mean scores in all three categories. Students with all As reported the highest mean scores in all three categories.

Special populations in our schools may present unique needs. Edwards (2017) found that many students feel "lost" in an educational model that is not designed for their learning styles or cultural backgrounds. These students may need a personalized learning approach unique from their classmates' needs. Furthermore, teachers may require additional training and resources to help them build meaningful relationships online with special populations of students (Kebritchi et al., 2017). Jackson et al. (2021) found that teachers struggle to understand their students' identities and may need additional instruction on how to account for student diversity.

Claim 3: Student attendance and course grades influence their feelings of connectedness to the classroom community.

It is commonly believed that academic success and attendance are closely related (Darling-Aduana, 2019). If students are absent from school, they miss instructional time and assignments that compose their course grades. "The best prediction of passing classes and earning high grades in high school comes from a combination of just two indicators - grades and attendance" (Allensworth et al., 2014, p. 1). Furthermore, conventional wisdom says that students must be involved in their classes, work hard, and engage with their courses to gain academic and noncognitive skills to be successful beyond high school (Farrington et al., 2012; McDaniel et al., 2022).

Absenteeism is not a new concern. Educators have focused on this issue for over a century and have yet to make sustained progress (McDaniel et al., 2022). "From Tom Sawyer to Ferris Bueller, truancy has been a staple of popular culture in the U.S." (Jacob & Lovett, 2017, p. 1). Meanwhile, there is an intuitive connection between school attendance and academic

learning. Furthermore, teenage truancy is more frequently associated with factors such as disengagement from school (Jacob & Lovett, 2017). Allensworth et al, 2014, noted that students who struggle in ninth grade with absences or low grades become high risk for not graduating. “Attendance is also a basic, but essential requirement for workforce success -an employee cannot show up 90 percent of the time and keep a job” (Allensworth et al., 2014, p. 10).

Students not connected to their classroom community and having difficulty interacting with others are less likely to attend school regularly (Yin et al., 2023). A literature review by Quin in 2017 conceptualized behaviors such as attendance and academic grades as indicators of engagement and connectedness and their influence on the educational outcomes of students. Since secondary students have greater control over their decision to attend classes and participate fully in their learning experience, secondary student's perceptions of school are critical to their educational success (Liu & Loeb, 2019).

The analysis of students in this study showed a negative, statistically significant relationship between the number of days students reported being absent from school and students' sense of connectedness, learning, and classroom community. As the number of days absent increased, the mean scores for connectedness, learning, and classroom community decreased. Darling-Aduana, 2019, found that students enrolled in an online course attended around three more days of school per year than students enrolled in solely face-to-face courses. This was not the case for students in the current study, in which students in online and blended courses missed school more than their face-to-face peers.

Similarly, in the current study, as students' grades decreased, so did the mean scores for connectedness, learning, and classroom community. Students in online and blended courses reported higher course grades than their face-to-face peers. Research completed by Chicago

Public Schools established a threshold of students earning Bs or better to be ready for college (Allensworth et al., 2014). Using a similar threshold, 76.3% of online and blended students reported earning B's or better compared to 70.3% of face-to-face students. Conversely, the percentage of students with at least one C or below was 23.6% for online/blended students and 29.7% for face-to-face students.

Grades are consistently found to be strongly related to educational attainment (Steedle & Way, 2024). A 2020 study by Nieuwoudt found a significant relationship between course grades and the number of hours online students participated in their online learning system. Other studies also found a positive relationship between the time students spent on the online learning system and their course grades (Nieuwoudt, 2018; Wong, 2013). Furthermore, Nieuwoudt found no differences in the grades of students attending online classes synchronously or asynchronously (Nieuwoudt, 2020).

Meanwhile, students with higher levels of cooperation, emotional control, and energy were less likely to demonstrate chronic absenteeism (Yin et al., 2023). Due to the cumulative effects of missing school, it is imperative to address attendance issues early in a student's educational career (NCES, 2009; Jacob & Lovett, 2017). Chronic absenteeism can adversely affect student achievement, well-being, and graduation rates (Allensworth et al., 2014). According to the National Center for Education Statistics, chronically absent students are at higher risk of lower academic achievement and dropping out of school (NCES, 2009).

A 2021 study found that 9th-grade students who miss ten total absences "reduce the probability of on-time graduation and ever enrolling in college by 2%" (Lui et al., 2021, p. 1). Before the pandemic, around 8 million students in the United States missed at least 10% of the school year, classifying them as chronically absent. In spring 2022, that number doubled to

around 16 million students (Chang et al., 2022). Figuring out the factors behind students' low grades or poor attendance and addressing those issues are steps toward improving classroom communities.

Educators are working to identify social and emotional learning (SEL) skills and interventions for adolescents to impact school climate and students' overall connection to school (McDaniel et al., 2022). Finding ways to improve student connectedness will likely produce compounding results and also improve student attendance and learning outcomes. A case study by Chu and Casimere in 2023 found that building relationships with students, boosting student engagement, and prioritizing student wellness drastically improved teen attendance (Chu & Casimere, 2023). Chiu et al., 2012, found that teacher-student relationships were statistically significantly related to school belonging and connectedness. The relationship between teachers and students was positively associated with students' sense of belonging (Ahmadi et al., 2020; Boardman et al., 2021).

Student attendance and academic performance are critical components for a successful education culture. The results of this study show that student attendance and course grades influence students' feelings of connectedness to the classroom community. Students in online and blended courses missed more school than their face to face peers. They also experienced lower classroom community than their peers in the blended and face-to-face educational setting. The results of this study show that as students miss more days of school their connectedness to the classroom community decreases. Furthermore, as academic performance decreases, classroom connectedness also decreases.

Implications for School Leaders:

High school online students may need additional structures and support to increase their sense of connectedness to the classroom community. Course designers and high school instructors should create a variety of course activities to ensure online students have multiple opportunities to interact with classmates and participate in learning activities. Multiple and varied activities are essential to student participation and interaction in their learning (Hattie, 2012). Research has revealed the importance of teacher training and exposure to best practices for online teaching (Johnson et al., 2023; Moore et al., 2021; Hart et al., 2019; Heafner et al., 2015). When teachers create clear course structures with consistent expectations for performance and use interactive teaching and learning styles, students learn better and have opportunities to interact with each other (Ahmadi et al., 2020; Kebritchi et al., 2017).

Moreover, learning is more meaningful and lasting when students participate in the classroom community (Wenger, 1998). While online students have more control over their learning, they must also have control over their ability to stay self-motivated and self-directed in their studies (Kebritchi et al., 2017; Gilbert, 2015). Johnson et al (2023) highlights the fact that younger students may lack the technological and learning autonomy to access online course work independently. Many online students could benefit from a parent or guardian who serves as a learning coach until the student no longer needs them (Simmons, 2022).

Yergler (2020) suggests five main ways to help adolescents feel a sense of belonging in an online environment. The first is to find ways to get to know each other, find out each other's interests and personalities (Yergler, 2020). Harris (2020) suggests assigning projects like creating get-to-know-you slides, sharing artifacts, or creating life maps or life timelines to allow students the opportunity to share information about themselves and get to know their classmates.

The second way is to clearly communicate classroom rules, expectations, and norms (Dorn et al., 2020; Yergler, 2020). Students feel a stronger sense of trust when they know what to expect. Teachers can assign class roles and responsibilities to establish a sense of consistency and comfort for students. Urging learners to ask questions and then following up with timely feedback will also help students feel more connected to their instructors (Zoloth, 2023). The third way to help build connectedness in an online classroom is to create class traditions and celebrations (Yergler, 2020). Strategies like starting weekly announcements the same way or consistently using sign-off questions or exit tickets can build traditions in the classroom. Minero (2019) suggests a strategy called Rose and Thorn where students must tell something positive and something negative about their week. Furthermore, Harris (2020) suggests using celebrations, spirit days or theme days to help create connections for students. The fourth way is to plan collaborative projects (Yergler, 2020). Zoloth (2023) says when students have shared goals and shared outcomes they feel more connected to one another. The fifth way to build classroom community in an online environment is for teachers to forge individual connections and get to know students as individuals. Teachers can use consistent check-ins (Harris, 2020), or give weekly shout outs or compliments (Zoloth, 2023) to build relationships with online students.

Furthermore, school leaders should maintain policies that let students choose whether to take online classes since full-time asynchronous learning is not the ideal learning environment for all students (Simmons, 2022). Online educators need a toolbox equipped with best-practice pedagogical strategies for the online learning environment (Darling-Hammond & Hyler, 2020; Hodges et al., 2020; Herold, 2022; Johnson et al., 2023). Despite the growing advantages of educational technology, technology cannot replace appropriate pedagogy and quality instructors

(Park & Shea, 2020). Educational leaders must ensure that instructors are equipped with best practices for online course design and delivery (Simmons, 2022).

While we have long understood the importance of student attendance, absences from school impact student connectedness and learning. School leaders must continue addressing the root causes of student absenteeism and working to mitigate the compounding long-term effects of missing school. Schools must also continue to employ school-based interventions, such as supportive and engaging teachers and student outreach, to reduce absenteeism (Liu & Loeb, 2019; Liu et al., 2021; Tran & Gershenson, 2021). Chu & Casimere (2023) suggest a "Primary Person" model in which a primary adult serves as a mentor to check in with students daily. Reaching out to students not living up to their potential can engage them more in the classroom community (Allensworth et al., 2014). Creating an early warning system, identifying at-risk students, and providing individualized support may increase attendance outcomes (Jacob & Lovett, 2017).

The impact of an effective teacher is multi-dimensional. Not only can an effective teacher foster a passion for learning and increase student engagement, but they are also responsible for course design, engaging students, and connecting them to the classroom community (Liu & Loeb, 2019; Tran & Gershenson, 2021). Finding an adult that students can relate to reduces the probability of chronic absenteeism and increases the likelihood of connectedness to the school community (Tran & Gershenson, 2021). Dalton (2018) credits the instructor as the most crucial factor in online student achievement. The instructor's presence is vital to students' overall learning experience (Kennette & Redd, 2015; Marzano & Marzano, 2003; Richardson et al., 2016; Wilson, 2018). Rios, Elliot, and Mandernach (2018) emphasize the importance of course design as a key to student satisfaction with online learning. Online courses should be "user-

friendly, easy to navigate, and incorporate clear guidance” (Rios et al., pg. 1, 2018). In addition, students should be engaged in course content through visual, written, and relevant experiences (Kaufman, 2015). Setting clear student expectations about engagement, communication, instructor availability, and workload are other critical considerations for teachers preparing to teach online (Hehir et al., 2021; Northcote et al., 2019).

The sample used in this study consisted of high school students at a single school; therefore, caution should be taken when generalizing scores to students at other schools. In the future, longitudinal studies could be examined to determine if the cross-sectional data in this survey holds up over time. Additional research could survey teachers and administrators to identify course design or pedagogy elements that promote stronger sense of community scores. The influence of teachers' experience level and previous training could provide insight into additional support K-12 teachers need to support online learners.

Conclusion

This quantitative study informs K-12 education stakeholders and policymakers at the high school level on decisions regarding online learning. Preexisting quantitative data was analyzed from a student survey of high school students in central Oklahoma. This study examined the relationship between students’ sense of connectedness to the classroom community and other demographic factors, educational settings, and measures of academic performance. Results found that online students are less connected than their peers in a blended or face-to-face educational setting. Student characteristics of gender, race, and grade level did not produce significant differences in connectedness; however, nonbinary/third-gender students and students who preferred not to reveal their gender had significantly lower connectedness than their peers. Furthermore, attendance and grades were significant predictors of student connectedness. While

student connectedness decreased as the number of days absent from school increased, student connectedness increased as course grades increased.

While K-12 online education has existed for more than twenty years, it has evolved through a variety of formats and district-operated programs are still relatively new. While an asynchronous online environment is not ideal for all students, there are many students who appreciate the format and are successful in the online learning environment. These results encourage a focus on student relationships and connectedness in a classroom community.

There is still much to learn about K-12 online education and the factors influencing student success. The burgeoning growth of online learning for K-12 students emphasizes the need for stakeholders to recognize the pronounced role online learning is likely to play in the future of K-12 education. Meanwhile, K-12 stakeholders must continue to seek better ways to equip teachers to meet the demands of online teaching (Darling-Hammond & Hyler, 2020) and district leaders must leverage high-quality online learning practices based on research and sound educational pedagogy (Arghobe et al., 2017). Providing equitable and inclusive access to online learning should drive the decision-making process for leaders; however, many additional nuanced factors must also be considered. Student connectedness to the classroom community plays a crucial role in students' overall participation and achievement.

References

- Ahmady, S., Kohan, N., Bagherzadeh, R., Rakshhani, T., & Shahabi, M. (2018). Validity testing of classroom community scale in virtual environment learning: A cross-sectional study. *Annals of Medicine and Surgery*, 36, 256–260.
<https://doi.org/10.1016/j.amsu.2018.08.021>
- Ali, T., Chandra, S., Cherukumilli, S., Fazlullah, A., Galicia, E., Hill, H., McAlpine, N., McBride, L., Vaduganathan, N., Weiss, D., & Wu, M. (2021). *Looking back, looking forward: What it will take to permanently close the K–12 digital divide*. San Francisco, CA: Common Sense Media.
- Allen, I.E., & Seaman, J. (2017). *Digital Compass Learning: Distance Education Enrollment Report 2017*. In ERIC. Babson Survey Research Group. <http://eric.ed.gov/?id=ED580868>
- Allen, I.E., & Seaman, C.A. (2007). *Likert Scales and Data Analyses*.
<https://www.bayviewanalytics.com/reports/asq/likert-scales-and-data-analyses.pdf>
- Allen, K., Kern, M. L., Vella-Brodrick, D., Hattie, J., & Waters, L. (2016). What Schools Need to Know About Fostering School Belonging: A Meta-analysis. *Educational Psychology Review*, 30(1), 1-34. <https://doi.org/10.1007/s10648-016-9389-8>.
- Allensworth, E., Gwynne, J., Moore, P., & de la Torre, M. (2014). *Looking Forward to High School and College: Middle Grade Indicators of Readiness in Chicago Public Schools*.
- Anli, G. (2019). Investigating the Relationship between Sense of Classroom Community and Interpersonal Sensitivity. *International Journal of Progressive Education*, 15(5), 371–379.

- Arghode, V., Brieger, E.W., & McLean, G.N. (2017). Adult learning theories: Implications for online instruction. *European Journal of Training and Development*, 41(7), 593-609. <https://doi.org/10.1108/ejtd-02-2017-0014>
- Arnesen, K.T., Hveem, J., Short, C.R., West, R.E., & Barbour, M.K. (2018). K-12 online learning journal articles: Trends from two decades of scholarship. *Distance Education*, 40(1), 32-53. <https://doi.org/10.1080/01587919.2018.1553566>
- Arnett, T. (2021). Carpe Diem: Convert Pandemic Struggles into Student-Centered Learning. In *Clayton Christensen Institute for Disruptive Innovation*. Clayton Christensen Institute for Disruptive Innovation.
- Arslan, G. (2018). Understanding the Association between School Belonging and Emotional Health in Adolescents. *International Journal of Educational Psychology*, 7(1), 21–41. <https://doi.org/10.17583/ijep.2018.3117>
- Arslan, G. (2021). Loneliness, college belongingness, subjective vitality, and psychological adjustment during Coronavirus pandemic: Development of the College Belongingness Questionnaire. *Journal of Positive School Psychology*, 5(1), 17–31. <https://doi.org/10.47602/jpsp.v5i1.240>
- Bao, D. (2020). Exploring How Silence Communicates. *English Language Teaching Educational Journal*, 3(1), 1–13. <https://doi.org/10.12928/eltej.v3i1.1939>.
- Barbour, M. K., Brown, R., Waters, L.H., Hoey, R., Hunt, J.L., Kennedy, K., Ounsworth, C., Powell, A., & Trimm, T. (2011). Online and Blended Learning: A Survey of Policy and Practice from K-12 Schools around the World. In *International Association for K-12 Online Learning*. International Association for K-12 Online Learning. <https://aurora->

[institute.org/resource/online-and-blended-learning-a-survey-of-policy-and-practice-from-k-12-schools-around-the-world/](https://www.pearsoned.com/institute.org/resource/online-and-blended-learning-a-survey-of-policy-and-practice-from-k-12-schools-around-the-world/).

- Barbour, M.K. (2021). The Shift to Distance Learning: Tracing the Roots of 100+ Years of Practice and Opportunity. *TechTrends* 65(6), 919–922. <https://doi.org/10.1007/s11528-021-00670-0>
- Barnett, K. (2016). The At-Risk Student’s Journey with Online Course Credit: Looking at Perceptions of Care. *Journal of Online Learning Research*, 2(4), 367-398.
- Basilaia, G., & Kvavadze, D. (2020). Transition to Online Education in Schools during a SARS-CoV-2 Coronavirus (COVID-19) Pandemic in Georgia. *Pedagogical Research*, 5(4), 1-9. <https://doi.org/10.29333/pr/7937>.
- Beise, C., & Wynekoop, J. (2001). *A Hierarchy of Needs for a Virtual Class*. <http://www.iaim.org>
- Bergmann, H. F. (2001). “The Silent University”: The Society to Encourage Studies at Home, 1873-1897. *The New England Quarterly*, 74(3), 447–477. <https://doi.org/10.2307/3185427>.
- Berry, S. (2019). Teaching to Connect: Community-Building Strategies for the Virtual Classroom. *Online Learning*, 23(1), 164-183. <https://doi.org/10.24059/olj.v23i1.1425>.
- Black, E. W., Dawson, K., & Priem, J. (2008). Data for free: Using LMS activity logs to measure community in online courses. *The Internet and Higher Education*, 11(2), 65–70. <https://doi.org/10.1016/j.iheduc.2008.03.002>.
- Boardman, K. L., Vargas, S. A., Cotler, J. L., Burshteyn, D., & College, S. (2021). Effects of Emergency Online Learning during COVID-19 Pandemic on Student Performance and Connectedness. *Information Systems Education Journal*, 19(4), 23–36.

- Boling, E. C., Hough, M., Krinsky, H., Saleem, H., & Stevens, M. (2012). Cutting the distance in distance education: Perspectives on what promotes positive, online learning experiences. *The Internet and Higher Education*, 15(2), 118–126.
<https://doi.org/10.1016/j.iheduc.2011.11.006>
- Booker, K. (2021). Rules without Relationships Lead to Rebellion: Secondary Teachers and School Belonging. *School Community Journal*, 31(1), 65–84.
- Britt, M. (2015). How to Better Engage Online Students with Online Strategies. *College Student Journal*, 49(3), 399–404.
- Bruss, K. V., Seth, P., & Guixiang Zhao. (2024). Loneliness, Lack of Social and Emotional Support, and Mental Health Issues -- United States, 2022. *MMWR: Morbidity & Mortality Weekly Report*, 73(24), 539–545. <https://doi.org.ezproxy.lib.ou.edu/10.15585/mmwr.mm7324a1>
- Caruth, G. D., & Caruth, D. L. (2013). Distance Education in the United States: From Correspondence Courses to the Internet. *Turkish Online Journal of Distance Education*, 14(2), 141–149.
- Carver, L. B. (2020). Supporting learners in a time of crisis. *Advances in Social Sciences Research Journal*, 7(4), 129–136. <https://doi.org/10.14738/assrj.74.8109>
- Castelo, M. (2020). How to Support English Language Learners During E-learning. *Ed Tech Magazine*. <https://edtechmagazine.com/k12/article/2020/05/how-support-english-language-learners-during-e-learning>
- Chandra, S., Chang, A., Day, L., Fazlullah, A., Liu, J., McBride, L., Mudalige, T., & Weiss, D., (2020). *Closing the K–12 Digital Divide in the Age of Distance Learning*. San Francisco, CA: Common Sense Media. Boston, Massachusetts, Boston Consulting Group

- Chang, H., Balfanz, R., & Byrnes, V. (2022, September 27). *Pandemic Causes Alarming Increase in Chronic Absence and Reveals Need for Better Data*. Attendance Works. <https://www.attendanceworks.org/pandemic-causes-alarming-increase-in-chronic-absence-and-reveals-need-for-better-data/>
- Chiu, M. M., Pong, S., & Mori, I. (2012). Immigrant Students' Emotional and Cognitive Engagement at School: A Multilevel Analysis of Students in 41 Countries. *Journal of Youth and Adolescence*, 41(11), 1409–1425.
- Chu, L., & Casimere, H. (2023). *Should Daily Attendance Be a Measure of Success? Prioritizing Community Building and Student Engagement. Case Studies in High School Redesign*.
- Creswell, J. W., & Creswell, D. J. (2018, January 2). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). SAGE Publications, Inc.
- Cutri, R. M., Mena, J., & Whiting, E. F. (2020). Faculty readiness for online crisis teaching: transitioning to online teaching during the COVID-19 pandemic. *European Journal of Teacher Education*, 43(4), 523–541. <https://doi.org/10.1080/02619768.2020.1815702>.
- Dalton, M. (2018). Online programs in higher education: Strategies for developing quality courses. *FOCUS on Colleges, Universities, & Schools*, 12(1), 1–8.
- Darling-Aduana, J. (2019). Behavioral Engagement Shifts among At-Risk High School Students Enrolled in Online Courses. *AERA Open*, 5(4).
- Darling-Hammond, L., & Hyler, M. E. (2020). Preparing educators for the time of COVID... and beyond. *European Journal of Teacher Education*, 43(4), 1–9. <https://doi.org/10.1080/02619768.2020.1816961>.
- Darrow-Magras, S. (2015). *Returning to High School Online: A Phenomenological Study Exploring the Student Experience of Internet-Based Learning Self-Efficacy and*

Persistence.

- De Coninck, D., & d'Haenens, L. (2023). Gendered Perspectives on Digital Skills and Digital Activities: Comparing Nonbinary and Binary Youth. *Comunicar: Media Education Research Journal*, 31(75), 35–45.
- De Risio, L., Pettorruso, M., Collevocchio, R., Collacchi, B., Boffa, M. B., Santorelli, M., Clerici, M., Martinotti, G., Zoratto, F., & Borgi, M. (2024). Staying connected: An umbrella review of meta-analyses on the push-and-pull of social connection in depression. *Journal of Affective Disorders*, 345, 358–368.
<https://doi.org/10.1016/j.jad.2023.10.112>
- Derakhshandeh, Z., & Esmaeili, B. (2020). Active-Learning in the Online Environment. *Journal of Educational Multimedia and Hypermedia*, 29(4), 299–311.
- De Vynck, G. & Bergen, M. (2020). Google Classroom users doubled as quarantines spread, Retrieved from; www.bloomberg.com/news/articles/2020-04-09/google-widens-lead-in-education-market-as-students-rush-online?sref=ExbtjSG.
- Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2020). COVID-19 and learning loss—disparities grow and students need help. *McKinsey & Company*, December 8, 2020.
- Edwards, C. (2017). Supporting K-12 Online Learners: Developing a Mentorship Program [ProQuest LLC]. In *ProQuest LLC*.
- Elliot, G., Kao, S., & Grant, A. (2004). Mattering: Empirical validation of a social-psychological concept. *Self and Identity*, 3(4), 339-354.
- Etherington, C. (2017, June 3). How PLATO changed the world...in 1960. *ELearningInside News*. <https://news.elearninginside.com/how-plato-changed-the-world-in-1960/>

- Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T. S., Johnson, D. W., & Beechum, N. O. (2012). *Teaching Adolescents to Become Learners: The Role of Noncognitive Factors in Shaping School Performance--A Critical Literature Review*.
- Fiorella, L., Stull, A. T., Kuhlmann, S., & Mayer, R. E. (2019). Instructor presence in video lectures: The role of dynamic drawings, eye contact, and instructor visibility. *Journal of Educational Psychology*, 111(7), 1162-1171. <https://doi.org/10.1037/edu0000325>
- Florida Virtual School: Grades K-12 online. FLVS. (n.d.). Retrieved October 9, 2022, from <https://www.flvs.net/>
- Gaytan, J., & McEwen, B. C. (2007). Effective Online Instructional and Assessment Strategies. *American Journal of Distance Education*, 21(3), 117–132. <https://doi.org/10.1080/08923640701341653>
- Gemin, B., Pape, L., & Evergreen Education Group. (2017) Keeping pace with K-12 online learning 2016. In *Evergreen Education Group*. Evergreen Education Group.
- German, E. (2020). Distance learning has been part of American culture for 100 years. Why can't we get it right? : Medium. <https://gen.medium.com/distancelearning-has-been-part-of-american-culture-for-almost-100-years-e3c001a05858>
- Gilbert, B. (2015). Online Learning Revealing the Benefits and Challenges. *Education Masters*. Retrieved from https://fisherpub.sjfc.edu/education_ETD_masters/303/
- Goodenow, C., & Grady, K. E. (1993). The Relationship of School Belonging and Friends' Values to Academic Motivation Among Urban Adolescent Students. *The Journal of Experimental Education*, 62(1), 60–71. <https://doi.org/10.1080/00220973.1993.9943831>

- Graff, M. (2003). Learning from web-based instructional systems and cognitive style. *British Journal of Educational Technology*, 34(4), 407–418. <https://doi.org/10.1111/1467-8535.00338>
- Gulosino, C., & Miron, G. (2017). Growth and performance of fully online and blended K-12 public schools. *Education Policy Analysis Archives*. 25 (124).
<http://dx.doi.org/10.14507/epaa.25.2859>
- Gusfield, J.R. (1978). *Community: a critical response*. New York: Harper Colophon.
- Hackney, J. (2013). The impact of high school schedule type on instructional effectiveness and student achievement in mathematics (Ph.D.). Available from ProQuest Dissertations & Theses Global. (1430909771).
- Hanson, D., Maushak, N., Schlosser, C., Anderson, M., & Sorensen, M. (1997). *Distance education: Review of the literature*, (2nd ed.). Washington, DC: Association for Educational Communications and Technology.
- Hart, C. M. D., Berger, D., Jacob, B., Loeb, S., & Hill, M. (2019). Online Learning, Offline Outcomes: Online Course Taking and High School Student Performance. *AERA Open*, 5(1). <https://doi.org/10.1177/2332858419832852>
- Harris, M. (2020, November 17). *15 Ideas for Building Community in Your Virtual Classroom*.
<https://www.teachingchannel.com/k12-hub/blog/build-community-virtual-classroom/>
- Hattie, J. (2012). *Visible learning for teachers*. New York, NY: Routledge.
- Heafner, T., Hartshorne, R., & Petty, T. (2015). *Exploring the effectiveness of online education in K-12 environments*. IGI Global.

- Hehir, E., Zeller, M., Luckhurst, J., & Chandler, T. (2021). Developing Student Connectedness under Remote Learning Using Digital Resources: A Systematic Review. *Education and Information Technologies*, 26(5), 6531–6548.
- Heppen, J.B., Sorensen, N., Allensworth, E., Walters, K., Rickles, J., Stachel-Taylor, S. & Michelman, V. (2017) The Struggle to Pass Algebra: Online vs. Face-to-Face Credit Recovery for At-Risk Urban Students, *Journal of Research on Educational Effectiveness*, 10(2), 272-296. <https://doi.org/10.1080/19345747.2016.1168500>
- Herold, B. (2022, April 13). How tech-driven teaching strategies have changed during the pandemic. *Education Week*. Retrieved October 29, 2022, from <https://www.edweek.org/technology/how-tech-driven-teaching-strategies-have-changed-during-the-pandemic/2022/04>
- Heslop, B. (2018, December 18). *History of content management systems and rise of headless CMS*. contentstack.com. Retrieved May 1, 2022, from <https://www.contentstack.com/blog/all-about-headless/content-management-systems-history-and-headless-cms/>
- Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *Educause Review*, 3. <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remoteteaching-and-online-learning>.
- Hornbeck, D., Abowitz, K. K., & Andrew Saultz. (2019). Virtual Charter Schools and the Democratic Aims of Education. *Education and Culture*, 35(2).
- Humber, J. F. (2018). Student Engagement in Online Courses: A Grounded Theory Case Study [ProQuest LLC]. In *ProQuest LLC*.

- Hussein, M. H., Ow, S. H., Ibrahim, I., & Mahmoud, M. A. (2021). Measuring Instructors Continued Intention to Reuse Google Classroom in Iraq: A Mixed-Method Study during COVID-19. *Interactive Technology and Smart Education*, 18(3), 380–402.
- Jacob, B., & Lovett, K. (2017, July 27). *Chronic absenteeism: An old problem in search of new answers*. <https://www.brookings.edu/articles/chronic-absenteeism-an-old-problem-in-search-of-new-answers/>
- Jamieson S. (2004). Likert scales: how to (ab)use them. *Medical education*, 38(12), 1217–1218. <https://doi.org/10.1111/j.1365-2929.2004.02012.x>
- Jamison, T.E., & Bolliger, D.U. (2020). Student perceptions of connectedness in online graduate business programs. *Journal of Education for Business*, 95(5), 275-287.
- Johnson, C., Walton, J., Strickler, L., & Elliott, J. (2023). Online teaching in K-12 education in the United States: A systematic review. *Review of Educational Research*, 93(3), 353–411. <https://doi.org/10.3102/00346543221105550>
- Johnson, S. D., & Aragon, S. R. (2003). An Instructional Strategy Framework for Online Learning Environments. *New Directions for Adult and Continuing Education*, 100, 31–43.
- Jonassen, D. H. (1994). *Computers in schools: Mindtools for critical thinking*. University Park, PA: Pennsylvania State University Press.
- Jonassen, D.H. (2000). Transforming learning with technology: Beyond modernism and postmodernism or whoever controls the technology creates the reality. *Educational Technology*, 40(2), 21–25.
- Justin. (2022, March 20). A brief history of Blackboard. Listedtech <https://listedtech.com/blog/brief-history-blackboard/>

- Kaden, U. (2020). COVID-19 school closure-related changes to the professional life of a K–12 teacher. *Education Sciences*, 10(6), 165. <https://doi.org/10.3390/educsci10060165>
- Kebritchi, M., Lipschuetz, A., & Santiago, L. (2017). Issues and Challenges for Teaching Successful Online Courses in Higher Education: A Literature Review. *Journal of Educational Technology Systems*, 46(1), 4–29.
- Keeton, M. T. (2004). Best online instructional practices: report of Phase I of an ongoing study. *Journal of Asynchronous Learning Networks*, 8(2), 75.
- Keeya, D. (2020, June 1). From TV to online: the evolution of remote learning at UH. Retrieved from: <http://thedailycougar.com/2020/06/01/remote-Learning-uh/>
- Kennette, L., & Redd, B. (2015). Instructor presence helps bridge the gap between online and on-campus learning. *College Quarterly*, 18(4).
- Keyes, T. S. (2019). A Qualitative Inquiry: Factors That Promote Classroom Belonging and Engagement among High School Students. *School Community Journal*, 29(1), 171-200.
- Kim, A.J. (2000). *Community Building on the Web*. Peachpit Press: Berkeley, CA:
- Kirtman, L. (2009). Online versus In-Class Courses: An Examination of Differences in Learning Outcomes. *Issues in Teacher Education*, 18(2), 103–116.
- Korpershoek, H., Canrinus, E., Fokkens-Bruinsma, M., & de Boer, H. (2020). The relationships between school belonging and students’ motivational, social-emotional, behavioral, and academic outcomes in secondary education: a meta-analytic review. *Research Papers in Education*, 35(6), 641-680. <https://doi.org/10.1080/02671522.2019.1615116>
- Krause, A., & Goering, E. M. (2021). Like Peas in a Pod: A Strategy for Creatively Transposing Interaction-Based Classes into an Online Learning Environment. *Journal of Teaching and Learning with Technology*, 10, 279–293.

- Lamblin, M., Murawski, C., Whittle, S., & Fornito, A. (2017). Social connectedness, mental health and the adolescent brain. *Neuroscience & Biobehavioral Reviews*, 80(1), 57–68.
<https://doi.org/10.1016/j.neubiorev.2017.05.010>
- Lee, E. E., Pate, J. J., & Cozart, D. D. (2015). Autonomy support for online students. *Techtrends: Linking Research & Practice to Improve Learning*, 59(4), 54-61.
- Lewis, E. (2020). Best Practices for Improving the Quality of the Online Course Design and Learners Experience. *The Journal of Continuing Higher Education*, 69(1), 1–10.
<https://doi.org/10.1080/07377363.2020.1776558>
- Lin, X., & Gao, L. (2020). Students' Sense of Community and Perspectives of Taking Synchronous and Asynchronous Online Courses. *Asian Journal of Distance Education*, 15(1), 169–179.
- Liu, J., & Loeb, S. (2019). *Engaging Teachers: Measuring the Impact of Teachers on Student Attendance in Secondary School. EdWorkingPaper No. 19-01*.
- Liu, J., Lee, M., & Gershenson, S. (2021). The short- and long-run impacts of secondary school absences. *Journal of Public Economics*, 199, N.PAG. <https://doi-org.ezproxy.lib.ou.edu/10.1016/j.jpubeco.2021.104441>
- Lowenthal, P. R., Horan, A., DeArmond, M. C., Lomellini, A., Egan, D., Johnson, M., Knut Möeller, Fayth Keldgord, Kuohn, J., Jensen, S., Stamm, A., & Pounds, D. (2023). Classroom Community and Online Learning: A Synthesis of Alfred Rovai's Research. *TechTrends*, 67(6), 931–944. <https://doi.org/10.1007/s11528-023-00904-3>
- Lowenthal, P. R., & Trespalacios, J. (2022). Classroom community and time: Comparing students' perceptions of classroom community in traditional vs. accelerated online courses. *Online Learning*, 26(4), 59-77. <https://doi.org/10.24059/olj.v26i4.3498>

- Mahmood, S. (2021). Instructional strategies for online teaching in COVID-19 pandemic. *Human Behavior and Emerging Technologies*, 3(1), 199–203.
- Mandernach, B. J., Robertson, S. N. & Steele, J.P. (2018). Beyond content: The value of instructor-student connections in the online classroom. *Journal of Scholarship of Teaching and Learning*, 18(4), 12–17.
- Martin, F., Wang, C., & Sadaf, A. (2018). Student perception of helpfulness of facilitation strategies that enhance instructor presence, connectedness, engagement and learning in online courses. *The Internet and Higher Education*, 37, 52-65.
- Martin, J. (2019). Building relationships and increasing engagement in the virtual classroom: Practical tools for the online instructor. *Journal of Educators Online*, 16(1), n1.
- Marzano, R. & Marzano, J. (2003). The key to classroom management. *Educational Leadership*, 61(1), 6-13. <https://www.ascd.org/publications/educational-leadership/sept03/vol61/num01/The-Key-to-Classroom-Management.aspx>
- Maslow, A.H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370-396.
- Maslow, A.H. (1962). *Toward a psychology of being*. Princeton, NJ: Van Nostrand.
- Maslow, A.H. (1970). *Motivation and Personality (2nd ed)*. Harper Collins: New York, NY.
- Maslow, A.H. (1987). *Motivation and Personality (3rd ed)*. Harper & Row Publishers.
- Matuga, J.M. (2009). Self-Regulation, Goal Orientation, and Academic Achievement of Secondary Students in Online University Courses. *Journal of Educational Technology & Society*, 12(3), 4–11.
- Mazza, R., & Milani, C. (2005). Exploring usage analysis in learning systems: Gaining insights from visualizations. 12th International Conference on Artificial Intelligence in Education (AIED 2005).

- Mazzolini, M. & Maddison, S. (2007). When to jump in: The role of the instructor in online discussion forums. *Computers & Education*, 49(2), 193–213. Elsevier Ltd. Retrieved October 26, 2022, from <https://www.learntechlib.org/p/67353/>.
- McBrien, J., Jones, P., & Cheng, R. (2009). Virtual spaces: Employing a synchronous online classroom to facilitate student engagement in online learning. *International Review of Research in Open and Distance Learning*, 10(3).<https://doi.org/10.19173/irrodl.v10i3.605>
- McCracken, H. (2020). Before Zoom and Coronavirus, How the telephone became the 20th century's most successful remote-learning technology for homebound students. *The 74*. <https://www.the74million.org/article/how-the-telephone-became-the-20th-centurysmost-successful-remote-learning-technology-for-homebound-students/>.
- McDaniel, S., Bardhoshi, G., Kivlighan, M. (2022). Universal SEL Improvement to Community and Prosocial Skills: A Pilot Study. *School Community Journal*, 32(2), 57-76.
<http://www.schoolcommunitynetwork.org/SCJ.aspx>.
- McLeod, S. A. (2019, July 17). *Constructivism theory for teaching and learning*. Simply Psychology. www.simplypsychology.org/constructivism.html
- McMillan, D. W. (1976). Sense of Community: An attempt at definition. Unpublished manuscript, George Peabody College for Teachers, Nashville, TN.
- McMillan, D. W. (1996). Sense of Community. *Journal of Community Psychology*, 24(4), 315–326.
- McMillan, D. W., & Chavis, D. M. (1986). Sense of Community: A Definition and Theory. *Journal of Community Psychology*, 14(January), 6–23.
- Means, B., Toyama, Y., Murphy, R., & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. Teachers College

- Record, 115(3), 1–47. <https://www.tcrecord.org/ExecSummary.asp?contentid=16882>
- Minero, E. (2019, February 5). *10 Powerful Community-Building Ideas*.
<https://www.edutopia.org/article/10-powerful-community-building-ideas/>
- Molnar, A., Miron, G., Barbour, M., Huerta, L., Shafer, S., Rice, J., Glover, A., Browning, N., Haggie, S., & Boninger, F. (2021). *Virtual Schools in the U.S. 2021*. Boulder, CO: National Education Policy Center. <http://nepc.colorado.edu/publication/virtual-schools-annual-2021> .
- Moore, R., Hayes, S., Croft, M., & ACT Center for Equity in Learning. (2021). Meeting the Online Learning and Basic Needs of High School Students during the Coronavirus Pandemic. Insights in Education and Work. In *ACT, Inc.* ACT, Inc.
- NATIONAL CENTER FOR EDUCATION STATISTICS (2009). Every school day counts: The forum guide to collecting and using attendance data. Ed.gov; National Center for Education Statistics. <https://nces.ed.gov/pubs2009/attendancedata/chapter1a.asp>
- Nieuwoudt, J. (2018). Exploring online interaction and online learner participation in an online science subject through the lens of the interaction equivalence theorem. *Student Success*, 9(4), 53–62. <https://doi-org.ezproxy.lib.ou.edu/10.5204/ssj.v9i4.520>
- Nieuwoudt, J. E. (2020). Investigating Synchronous and Asynchronous Class Attendance as Predictors of Academic Success in Online Education. *Australasian Journal of Educational Technology*, 36(3), 15–25.
- Noonoo, S. 2012, June 12. Flipped learning founders set the record straight. Retrieved from: <https://thejournal.com/articles/2012/06/20/flipped-learning-founders-q-and-a.aspx>

- Northcote, M., Gosselin, K., Kilgour, P., Reynaud, D., & McLoughlin, C. (2019). A professional learning program for novice online teachers using threshold concepts. *Online Learning*, 23(4), 336–353. Doi: 10.24059/olj.v23i4.1573
- Nowell, B., & Boyd, N. (2010). Viewing Community as Responsibility as well as Resource: Deconstructing the Theoretical Roots of Psychological Sense of Community. *Journal of Community Psychology*, 38(7), 828–841.
- National Standards for Quality (NSQ). (2019). NSQ National Standards for Online Courses. (Third edition). <https://www.nsqol.org/wp-content/uploads/2019/09/National-Standards-for-Quality-Online-Courses-Catalog3-2019.09.01.pdf>
- Park, H., & Shea, P. (2020). A Review of Ten-Year Research through Co-citation Analysis: Online Learning, Distance Learning, and Blended Learning. *Online Learning*, 24(2), 225–244.
- Patrick, S., & Jones, F. (2019, December 16). *Fast facts about online learning*. Aurora Institute. <https://aurora-institute.org/resource/fast-facts-about-online-learning/>
- Patrick, S., & Powell, A. (2009). A summary of research on the effectiveness of K-12 online learning. International Association for K-12 Online Learning. https://www.k12.com/sites/default/files/pdf/school-docs/NACOL_ResearchEffectiveness-hr.pdf
- Peacock, S., & Cowan, J. (2019). Promoting Sense of Belonging in Online Learning Communities of Inquiry in Accredited Courses. *Online Learning*, 23(2), 67–81.
- Picciano, A. G. (2017). Theories and Frameworks for Online Education: Seeking an Integrated Model. *Online Learning*, 21(3). <https://doi.org/10.24059/olj.v21i3.1225>
- Picciano, A. G., Seaman, J., & Sloan Consortium. (2009). K-12 Online Learning: A 2008 Follow-Up of the Survey of U.S. School District Administrators. *Sloan Consortium*.

- Pittman, L. D., & Richmond, A. (2008). University belonging, friendship quality, and psychological adjustment during the transition to college. *Journal of Experimental Education*, 76(4), 343–361. <https://doi.org/10.3200/JEXE.76.4.343-362>.
- Quin, D. (2017). Longitudinal and Contextual Associations Between Teacher-Student Relationships and Student Engagement: A Systematic Review. *Review of Educational Research*, 87(2), 345–387. <https://doi.org/10.3102/0034654316669434>
- Richardson, J., Besser, E., Koehler, A., Lim, J., & Strait, M. (2016). Instructors' perceptions of instructor presence in online learning environments. *International Review of Research in Open and Distributed Learning*, 17(4), 82–104.
- Rios, T., Elliott, M., & Mandernach, B. J. (2018). Efficient Instructional Strategies for Maximizing Online Student Satisfaction. *Journal of Educators Online*, 15(3).
- Rovai, A.P. (2001). Building Classroom Community at a Distance: A Case Study. *Educational Technology Research and Development Journal*, 49(4), 35–50.
- Rovai, A.P. (2002, April). Building Sense of Community at a Distance. *International Review of Research in Open and Distance Learning*, 3(1).
- Rovai, A.P. (2002, May). Development of an Instrument To Measure Classroom Community. *Internet and Higher Education*, 5(3), 197–211.
- Rovai, A.P. (2002, June). Sense of Community, Perceived Cognitive Learning, and Persistence in Asynchronous Learning Networks. *Internet and Higher Education*, 5(4), 319–332.
- Rovai, A.P. (2002, July). A Preliminary Look at the Structural Differences of Higher Education Classroom Communities in Traditional and ALN Courses. *Journal of Asynchronous Networks*, 6(1), 41–56.

- Rovai, A.P. (2004). A Constructivist Approach to Online College Learning. *Internet and Higher Education*, 7(2), 79–93.
- Rovai, A.P., Lucking, R., & Cristol, D. (2000). Sense of Classroom Community Index (SCCI).
Unpublished
- Rowland, D. & Pivcevic, P. (2022, April 8). Leading change post-pandemic: Belonging. London School of Economics. [Blog]
- Saba, F. (1998). Enabling the distance learner: A strategy for success. *Distance Education Report*.
- Saba, F. (2013). Building the future: A theoretical perspective. In M.G. Moore (Ed.), *Handbook of distance education* (3rd ed.) (pp. 49–65). Routledge.
- Salas, R. (2022, June 22). *The Block Schedule System: 7 Pros and 3 Cons*. Education Advanced, Inc. <https://educationadvanced.com/resources/blog/the-block-schedule-system-7-pros-and-3-cons/>
- Sarason, S.B. (1974). *The psychological sense of community: Prospects for a community psychology*. San Francisco, CA: Jossey-Bass.
- Sarkar, S. (2020, May 16). *A brief history of online education*. Adamas University. Retrieved May 1, 2022, from <https://adamasuniversity.ac.in/a-brief-history-of-online-education/>
- School Connectedness. (2019). www.cdc.gov/healthyyouth/protective/school_connectedness.html
- Seppala, E., Rossomando, T., & Doty, J. R. (2013). Social Connection and Compassion: Important Predictors of Health and Well-Being. *Social Research*, 80(2), 411–430.
<http://www.jstor.org/stable/24385608>

- Shah, R. K. (2019). Effective Constructivist Teaching Learning in the Classroom. Shanlax International Journal of Education, 7(4),1-13., <https://ssrn.com/abstract=4004512>
- Simmons, K. (September 13, 2022). (rep.). *K-12 Virtual Education Promising Practices*. Office of Legislative Oversight, Montgomery County, Maryland.
- Singh, V., & Thurman, A. (2019). How Many Ways Can We Define Online Learning? A Systematic Literature Review of Definitions of Online Learning (1988-2018). *American Journal of Distance Education*, 33(4), 289–306.
- Sieving, R.E., McRee, A.L., McMorris, B.J., Schlafer, R.J., Gower, A.L., Kapa, H.M., Beckman, K.J., Doty, J.L., Plowman, S.L., & Resnick, M.D. (2017). Youth-Adult Connectedness: *American Journal of Preventive Medicine*, 52(3), S275-S278.
<https://doi.org/10.1016/j.amepre.2016.07.037>
- Sleator, R. D. (2010). The evolution of eLearning Background, blends and blackboard... *Science Progress (1933-)*, 93(3), 319–334. <http://www.jstor.org/stable/43424249>
- Smith, M. C., & Winking-Diaz, A. (2004). Increasing Students' Interactivity in an Online Course. *Journal of Interactive Online Learning*, 2(3).
- Sorensen, C. (2015). An Examination of the Relationship between Online Class Size and Instructor Performance. *Journal of Educators Online*, 12(1), 140–159.
- Steedle, J., & Way, J. (2024). Decomposing High-School GPA as a Predictor of First-Year GPA. *Educational Assessment*, 29(1), 21-35.
- Steele, J., Holbeck, R., & Mandernach, J. (2019). Defining Effective Online Pedagogy. *Journal of Instructional Research*, 8(2), 5–8.

- Steiner, R.J., Sheremenko, G., Lesesne, C., Dittus, P.J., Sieving, R.E., & Ethier, K.A. (2019). Adolescent Connectedness and Adult Health Outcomes. *Pediatrics*, 144(1), e20183766. <https://doi.org/10.1542/peds.2018-3766>.
- Su, A. (2016, September 27). A timeline of Google Classroom's march to replace learning management systems. <https://www.edsurge.com/news/2016-09-27-a-timeline-of-google-classroom-s-march-to-replace-Learning-management-systems>
- Sullivan, G. M., & Artino, A. R. (2013). Analyzing and Interpreting Data From Likert-Type Scales. *Journal of Graduate Medical Education*, 5(4), 541–542. <https://doi.org/10.4300/jgme-5-4-18>
- Sulun, C. (2022). The evolution and diffusion of learning management systems. Retrieved from: <https://ohiostate.pressbooks.pub/drivechange/chapter/the-evolution-and-diffusion-of-learning-management-systems-the-case-of-canvas-lms/>
- Taylor, B. D., & McNair, D. E. (2018). Virtual School Startups: Founder Processes in American K-12 Public Virtual Schools. *International Review of Research in Open and Distributed Learning*, 19(1), 312–326.
- Terosky, A. L., & Heasley, C. (2015). Supporting Online Faculty through a Sense of Community and Collegiality. *Online Learning*, 19(3), 147–161.
- The history of online schooling*. OnlineSchools.org. (2022, October 26). Retrieved October 27, 2022, <https://www.onlineschools.org/visual-academy/the-history-of-online-schooling/>
- Thomson, D. L. (2010). Beyond the Classroom Walls: Teachers' and Students' Perspectives on How Online Learning Can Meet the Needs of Gifted Students. *Journal of Advanced Academics*, 21(4), 662–712.
- Thomson, D. (2011). Conversations With Teachers on the Benefits and Challenges of Online

- Learning for Gifted Students. *Gifted Child Today*; Thousand Oaks, 34(3), 31–39.
- Tran, L., & Gershenson, S. (2021). Experimental Estimates of the Student Attendance Production Function. *Educational Evaluation and Policy Analysis*, 43(2), 183–199.
- Townsend, E., Campbell, C., Curran-Smith, J., McGinn, F., Persaud, D., & Peters, P. (2002). Accessibility and interactivity in distance education programs for health professions. *Journal of Distance Education*, 17(2), 1–24.
- Vrasidas, C., & Zembylas, M. (2004). Online Professional Development Lessons from the Field. *Education + Training*, 46(6–7), 326–334.
- Watson, F. F., Castano Bishop, M., & Ferdinand-James, D. (2017). Instructional Strategies to Help Online Students Learn: Feedback from Online Students. *TechTrends: Linking Research and Practice to Improve Learning*, 61(5), 420–427.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge University Press.
- Whiteside, A. L. (2015). Introducing the Social Presence Model to Explore Online and Blended Learning Experiences. *Online Learning*, 19(2). <https://doi.org/10.24059/olj.v19i2.453>.
- Willermark, S., & Islind, A. S. (2022). Seven educational affordances of Virtual Classrooms. *Computers and Education Open*, 3, 100078. <https://doi.org/10.1016/j.caeo.2022.100078>
- Wilson, S. (2018). Leading-edge online classroom education: Incorporating best practices beyond technology. *American Journal of Business Education*, 11(3), 41–48.
- Wong, L. (2013). Student engagement with online resources and its impact on learning outcomes. *Journal of Information Technology Education: Innovations in Practice*, 12, 129–146.

- Yergler, S. (2020, August 17). *How to Create Community in a Virtual Classroom*. Edutopia.
<https://www.edutopia.org/article/how-create-community-virtual-classroom/>
- Yin, M., Szabo, J., & Baumgartner, E. (2023). *Social and Emotional Skills and Chronic Absenteeism. Research Brief for the Houston Independent School District [Brief 3A]*.
- You, J., & Kang, M. (2014). The role of academic emotions in the relationship between perceived academic control and self-regulated learning in online learning. *Computers & Education*, 77, 125–133.
- Young, K., Young, C., & Beyer, A. (2017). Does the classroom matter? How the physical space affects learning in introductory undergraduate science courses. *Journal of College Science Teaching*, 46(6), 80–87.
- Zhang, Y., & Lin, C.H. (2020). Student Interaction and the Role of the Teacher in a State Virtual High School: What Predicts Online Learning Satisfaction? *Technology, Pedagogy, and Education*, 29(1), 57–71.
- Zhao, Y. (2021). Could the Pandemic Change Education for the Better? *Educational Leadership*, 79(1), 26–31.
- Zoloth, S. (2023, November 19). *5 Strategies for Building Community in the Classroom*.
<https://www.nshss.org/resources/blog/blog-posts/5-strategies-for-building-community-in-the-classroom/>