2024

Engagement Strategies in a Virtual Classroom

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Engagement Strategies in a Virtual Classroom

by
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An Applied Dissertation Submitted to the
Abraham S. Fischler College of Education
and School of Criminal Justice in Partial
Fulfillment of the Requirements for the
Degree of Doctor of Education

Nova Southeastern University
2024

Approval Page

This applied dissertation was submitted by Kelly Clarke under the direction of the persons listed below. It was submitted to the Abraham S. Fischler College of Education and School of Criminal Justice and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

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Statement of Original Work

I declare the following:

I have read the Code of Student Conduct and Academic Responsibility as described in the *Student Handbook* of Nova Southeastern University. This applied dissertation represents my original work, except where I have acknowledged the ideas, words, or material of other authors.

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April 18, 2024
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Acknowledgments

I would like to express my appreciation and gratitude to my dissertation chairperson, Dr. Sandra Duncan. Thank you for your patience and responding to my frequent emails and messages. I am so grateful to you; thank you for walking alongside me. To all my previous professors at Nova Southeastern University, thank you. I have never felt so challenged.

Four years of hard work, determination, and perseverance have paid off. To my dad, Greg, you have always given me the confidence to push myself beyond my comfort zone. To my sister, Becky, I am so proud to be your sister. Always remember to have faith in yourself. To my brother, Brett and sister-in-law, Nichole, thank you for the endless laughs to get my mind off anything out of my control. To my mom, Beth, I have always looked up to you. Thank you for being a guiding light, illuminating my path with your wisdom and love. To my husband, Travis, you are my rock, confidant, best friend, and editor. I could not have done this without your love and support. To my children, Avery, Weston, and Wyatt— never doubt how strong you are. Mama did this for you. As long as I am living, my babies you'll be. Always.

Abstract

Engagement Strategies in a Virtual Classroom. Kelly Clarke, 2024: Applied Dissertation, Nova Southeastern University, Abraham S. Fischler College of Education and School of Criminal Justice. Keywords: asynchronous, synchronous, cooperative learning strategies, engagement, classroom culture, virtual education, and transactional distance theory

This applied dissertation was designed to determine if cooperative learning strategies increased student engagement in a virtual elementary classroom. The purposes of this study were (a) to determine whether the implementation of cooperative learning strategies increased student engagement and (b) to explore student perceptions of engagement.

In this mixed methods research, the writer utilized a sequential explanatory design. The pre-test and post-test survey used in this study was based on the *Elementary Student Engagement: Student Response* created by the American Institutes for Research (2023). Convenience sampling was used to select 12 students to complete both surveys. A total of 4 students completed the interview after 4-weeks of implementation of cooperative learning strategies in the virtual classroom. The researcher analyzed the quantitative data using statistical software. Themes were generated after the qualitative phase of the study. The themes that were generated were collaboration, peer support, and engagement.

An analysis of the data revealed that there was a significant statistical difference in the engagement surveys before and after implementation of cooperative learning strategies. The student participants expressed an increase of collaboration with other students after the implementation of cooperative learning strategies. Although the sample size was small in this mixed methods study, the researcher recommends the use of cooperative learning strategies to increase engagement in the virtual classroom.

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Chapter 1: Introduction

Statement of the Problem

Virtual education has been an option for students and families since the mid-1990s (Banas & Emory, 1998). After the COVID-19 pandemic in 2020, families from across the globe transitioned from their brick-and-mortar classroom to online learning (Beeman, 2022). In the United States, the response to the pandemic shutdown affected many areas of life, including education (Castro & George, 2021). In the spring of 2020, many school districts, universities, and other educational institutions transition from brick-and-mortar settings to remote learning. Due to the increase of students learning from afar, virtual education has grown exponentially nationally and internationally (Beeman, 2022; Muir et al., 2022). Transitioning to online education has not been an easy feat for educators and students across the United States and throughout the world. Despite the challenges of online learning, it is imperative young children continue their education to avoid an educational decline for generations to come (Hatch, 2021). Therefore, there is an explicit need to further develop and enhance the world of virtual education.

Hatch's (2021) research purported that to aid in the expansion of virtual education, educators must have resources and opportunities to increase student engagement and discourse within their online classroom. There is, however, limited research on whether virtual students are more engaged than students who are in a brick-and-mortar classroom. Students who are unengaged are profoundly impacted academically and emotionally, including a decrease in social skills and the ability to problem-solve in a collaborative format (Choi & Walters, 2018). Beeman's (2022) research, for example, found that student participation is positively correlated to student

engagement and connected to a positive classroom culture. Future research should investigate the importance of student interaction, engagement, and satisfaction in a synchronous virtual classroom to ensure that students are successful in the online classroom.

In a fully online program, students may participate in classroom meeting sessions with their instructor several times each week, along with completing assignments independently. Because this type of learning is done in partial isolation, there is a lack of socialization with peers, and this isolation has become a widespread problem encountered by virtual students. Students report online courses result in a lack of socialization, including decreased teamwork, collaboration, and feedback from peers (Choi & Walters, 2018). To make up for this lack of socialization, instructors typically encourage students to participate in discussions in a virtual setting and believe that fully engaged students are essential to ensure their understanding of material.

The Research Problem

The problem studied in this applied dissertation is that target students are not engaged while working in a full-time virtual elementary classroom. In the researcher's third grade classroom, 24 students regularly attended virtual live sessions. Out of these students, 15 did not engage with the instructor by turning on their camera, conversing in the chat box, or utilizing the features within the presentation tool, Nearpod (Nearpod, n.d.).

Background and Justification

Creating an online learning environment that encourages student dialogue is the responsibility of the instructor. To encourage student dialogue in classrooms, students

must feel comfortable and safe. Beeman (2022) stated that a student's participation is positively correlated to the classroom culture the instructor creates, including rapport with other classmates and connectedness to each other. Further, according to Choi and Walters (2018), student-led discussions lead to increased understanding of taught material. Silent online classrooms or discouraging student-led discussions can have detrimental effects on young students. In a study conducted by Wenham (2019), for instance, the psychological damage of a silent classroom to young students includes increased anxiety, humiliation, and reluctance to engage in conversation related to content in subsequent years.

Elementary-aged students must have opportunities to engage in conversation with peers to build understanding and reinforce critical thinking skills. In virtual education, students might not have the ability to engage in such conversations. The negative impact of reduced talking includes a decrease in student social skills, ability to participate in teamwork with peers, and opportunities for solving problems collaboratively (Choi & Walters, 2018). Therefore, it is imperative that teachers, especially virtual teachers, are aware of the detriments of a silent classroom and that student dialogue and conversations are encouraged throughout online lessons.

Deficiencies in the Evidence

Since the COVID-19 pandemic, virtual schools have expanded to meet the educational needs of a variety of students. Although there is a plethora of literature on virtual education, there is a limited amount of research on methods to improve student discourse in an online classroom (Beeman, 2022). Students need opportunities to engage in conversation with peers to aid in retention of newly taught and reviewed material.

According to Choi and Walters (2018), there is limited research on whether virtual students benefit academically with the freedom of discussion and collaboration with peers. Consequently, research is needed to identify the effects of virtual elementary education, especially if teachers promote student-led discussions and discourse in their classroom.

Audience

Virtual elementary teachers may benefit from additional research on methods that encourage student conversation to promote retention and understanding of material taught. In addition, social workers, school counselors, students, and parents of virtual elementary-aged students may also benefit from this applied dissertation research study.

Contribution to the Field

Virtual education has steadily increased since the Covid-19 pandemic (Beeman, 2022; Choi & Walters, 2018). The results of this study may enable virtual educators to utilize cooperative engagement strategies to increase student involvement during synchronous classes. By leveraging tools such as the use of Zoom's breakout rooms, educators may create meaningful interactions amongst students and promote active participation. Fostering a sense of community and collaboration within the virtual classroom may mitigate feelings of isolation and enhance learning outcomes.

Purpose Statement

The purpose of this study was to determine if the implementation of cooperative engagement strategies improves student involvement during synchronous class time, as measured by the presentation tool (Nearpod), Zoom camera features, and pretest and posttest surveys in a full-time virtual elementary classroom. A sequential explanatory

mixed methods study was used, collecting quantitative data first and explaining the quantitative results with in-depth qualitative data (Creswell & Plano Clark, 2017). In the first quantitative phase of the study, survey results from students in the researcher's third grade class addressed the relationship between the implementation of cooperative learning strategies and student engagement. In the second phase, qualitative semi-structured interviews were conducted to explore students' perceptions of classroom engagement. In this exploratory phase, the aim was to determine if the implementation of cooperative engagement strategies increases student involvement in a virtual third grade classroom.

Definition of Terms

For this study, there are several terms that are relevant to this applied dissertation and, therefore, are identified and defined. These terms will be used throughout this applied dissertation research study.

Asynchronous

Students and instructors who do not meet in live time, rather the facilitator uploads recordings and additional materials (such as the interactive lesson presentation, Nearpod) to aid the learner (Gamage et al., 2022).

Classroom Culture

Unwritten goals and rules created by the teacher and students within the classroom contribute to the establishment of an effective learning environment (Cicco, 2017).

Cooperative Learning Strategies

Students who work in groups towards a common goal or outcome will only

succeed if they work together as a team, while holding accountable individual contributions and efforts (Wyman & Watson, 2020).

Engagement

The degree in which a learner focuses on the assigned task or activity, while committing to stay on task and willingness to participate (Spiker, 2021).

Explicit Instruction

A common instructional approach where instructors break tasks into manageable components, provides modeling, uses prompts, providing feedback, and creating opportunities for practice (Long et al., 2021).

Learning Management System

Technology that stores online courses and organizes course content facilitating efficient management and access to educational materials (Samawi & Al-kreimeen, 2022).

Nearpod

A digital presentation tool students can complete synchronously or asynchronously (Nearpod, n.d.). Various slide settings may be used, such as open-ended questions, matching activities, interactive videos, virtual field trips, polls, and draw-it slides. The teacher or instructor can visualize student work in real-time, when conducted synchronously (Anggoro & Khasanah, 2022).

Synchronous

Instructors delivering course work to students in real time using a video conferencing system, such as Zoom (Gamage et al., 2022).

Webcam

Could also be known as video conferencing, webcams allow individuals to see each other's facial expressions, interpret moods, and feelings (Dennen et al., 2022).

Zoom

A web-conferencing application that connects people virtually, either through video, audio-only, or both, while conducting live discussions, which can be recorded for later viewing (Quiamco et al., 2022).

Chapter 2: Literature Review

The purpose of this literature review is to report and investigate literature findings in peer-reviewed articles, contemporary journals, and textbooks on the topic of virtual education and engagement strategies. An exhaustive literature review was conducted through the Nova Southeastern University online library databases, including ERIC, ProQuest, and Education Source databases, as well as primary sources through the Nova Southeastern University Interdisciplinary Loan. This literature review will include (a) the theoretical framework; (b) synchronous and asynchronous virtual classrooms; (c) lack of student engagement in the virtual classroom; and (d) solutions to increase student engagement in the virtual environment. Minimal research has been conducted investigating the effects of student engagement and participation in a full-time virtual synchronous elementary classroom, which stipulates the need to investigate the connection between student engagement and participation in a full-time elementary virtual classroom (Ong & Quek, 2023).

Introduction

Virtual education in the United States has grown exponentially since the COVID-19 pandemic (Diaz et al., 2022). The shift to online learning has taken a hold of institutions nationwide. According to the Educause Horizon Report (2022), online learning is not deemed as a short-term mode of instruction but may be used as a sustainable investment for the future. In response to the global pandemic, transition from face-to-face instruction to remote instruction occurred throughout the United States and the world (Gamage et al., 2022). In the United States, approximately six million students are enrolled in virtual schools, compared to 361,000 students in Canada, and 173,889

students in the United Kingdom in 2022 (Roach & Attardi, 2022). The transition to virtual education has changed the landscape of what class participation and student engagement can look like (Beeman, 2022). Integrating technology into the classroom adds a layer of complexity for teachers and students. Too often, virtual students are disengaged in the online classroom. Disengagement may cause low motivation, poor participation, and disinterest in the topic. Whereas students who are heavily engaged in a learning program demonstrate active attention, interest, and motivation to succeed academically (Alrajeh & Shindel, 2020).

Despite the transition to online learning, instructors must build a rapport with students (Samawi & Al-kreimeen, 2022). Increased rapport is connected to student connectiveness to instructors and leads to engagement and participation. In comparison to Samawi and Al-kreimeen (2022), Alrajeh and Shindel (2020) stated that building rapport with a student is essential in the student's learning process. Positive interactions between student and teacher allow learners to feel connected to the classroom culture and build a supportive classroom environment (Alrajeh & Shindel, 2020).

One such way to enhance student engagement is to use cooperative engagement strategies. Cooperative engagement learning is a teaching strategy where students are organized in heterogeneous groups and cooperate with one another to achieve common goals. Using cooperative learning, students can blend their abilities to achieve goals set by the teacher (Wyman & Watson, 2020). Since student interaction improves the development of critical thinking, it is essential to embed such engagement within the virtual elementary classroom. Silva et al., (2022) stated cooperative learning allows students to use critical thinking skills, which aid in communication and creative thinking.

Theoretical Framework

Due to the increase of distance education throughout the nation, more support is needed for virtual school educators. The problem of students not engaged in virtual education is grounded in the Transactional Distance Theory, developed by Michael Moore in 1973 (Abuhassna & Alnawajha, 2023). Transactional distance is the interplay of communication between student and teacher as they interact through technology (Roach & Attardi, 2022). This theory is used to study the use of synchronous and asynchronous teaching and learning outside of the traditional classroom setting (Kara, 2021; Reyes, 2013). The term 'transactional distance' refers to the communication styles between teachers and learners in the virtual realm. The transactional distance represents the gap of knowledge between teacher and student (Roach & Attardi, 2022).

Moore's theory recognizes the distance is not time or space, rather than a distance in communication and psychological distance that is impacted by the structure of the course, dialogue between student and teacher, and learner autonomy (Achuthan et al., 2024; Fabian et al., 2022). As online learning grows, there becomes an increasing need to close the transactional distance between teacher and student. The gap, or distance, between student and teacher presents numerous opportunities where misunderstanding or misconceptions may occur (Roach & Attardi, 2022). Using communication strategies, online educators can manipulate the space to enhance student engagement and achievement.

Dialogue

There are three types of interactions that influence the success of the learner, including dialogue, program structure, and learner autonomy (Kara, 2021; Reyes, 2013).

Dialogue refers to the communication between learner and teacher, where each party uses respectful language and is an active listener (Reyes, 2013). Like Reyes' findings, Kara (2021) stated dialogue as the mutual interaction between teacher and learners and is referred to as purposeful and constructive. Instructional dialogue occurring between the student and the teacher should be considered purposeful and constructive (Achuthan et al., 2024; Roach & Attardi, 2022). Comparing to Reyes' beliefs regarding dialogue, Roach and Attardi (2022) stated communication between virtual student and teacher should be continuous, whereas an absence of communication contributes to the increase of transactional distance.

Program Structure

The structure of the online program outlines the flexibility or rigidity of the program, and accommodations made to support the needs of all learners (Roach & Attardi, 2022). The highly structured course offering is connected to minute-by-minute organization of the course and the responsiveness to individualistic needs of the students (Reyes, 2013; Roach & Attardi, 2022). However, despite the rigid structure of the program, teacher-student communication is integral. When course programming is highly structured, but teacher communication is limited, the transactional distance between teacher and student is increased (Roach & Attardi, 2022).

Learner Autonomy

Learner autonomy is the relationship between teacher and student, where goals are created, and evaluations are made to determine the effectiveness of the program (Reyes, 2013). Learner autonomy is contingent upon the characteristics of the learner. Reyes stated that learners who are more autonomous can manage any degree of dialogue

from their instructor, whereas students who are not skilled in self-regulation need a higher level of dialogue. Moore (2007) stated “the level of autonomy required of the learner increases as the transactional distance decreases” (p. 96). Students with greater autonomy would be sufficient in courses with little communication, whereas students with less autonomy would experience less transactional distance when there is an increased dialogue between student and teacher and greater program structure.

Virtual education leaders use Moore’s (2007) theory of transactional distance to determine the nature of online learning (Fabian et al., 2022). Transactional distance theory surrounds three forms affecting transactional distance, including student-teacher interaction, student-content interaction, and student-student interaction (Fabian et al., 2022). Factors of success in online instruction are gleaned from student engagement, accessibility to technology, and course content. As students interact with their instructors, their transactional distance decreases, gaining autonomy and comfort in their courses (Fabian et al., 2022; Reyes, 2013). As stated by Reyes (2013), students who are autonomous in their learning can manage a wide degree of dialogue, whereas students who are not able to self-regulate, rely on a higher degree of dialogue and support from their instructor. Students with greater autonomy will experience greater comfort in distance, thus there is a specific need to encourage dialogue for all virtual students.

Learner-to-learner interaction refers to the opportunities provided to students to learn from one another through discussion, exchanging of resources, and sharing of ideas and experiences (Muir et al., 2022). Castro and George’s (2021) research stated that learner-to-learner interaction is the foundation of student collaboration, by promoting student interactions without the instructor. By sharing ideas, students may feel more

connected to the course, therefore closing the transactional distance. However, Reyes (2013) noted that in a study conducted by Kuskis (2006), learner-to-learner dialogue did not reduce transactional distance. Additional research is needed to determine the role of learner-to-learner in the virtual classroom and its connection to Moore's transactional distance theory.

Synchronous and Asynchronous Virtual Classrooms

The internet is seen as an essential educational tool, readily used by teachers and students throughout the world (Samawi & Al-kreimeen, 2022). Werang and Leba (2022) defined online teaching and learning as a type of education where student and teacher are separated, thus learning materials and schedules can be accessed by using technological devices and the internet. Online teaching and learning take place through the internet, where online teaching and learning occurs. Students and families opt into online learning due to the convenience, self-pacing, and self-directed learning virtual education provides (Bollinger & Martin, 2020). In a study conducted by Tarhini et al., (2017) participants who engaged in virtual learning described the process as enjoyable and interesting, and demonstrated desirable results on assessments.

In a virtual classroom, teachers may communicate with their students synchronously or asynchronously. Synchronous learning is based on real-time interactions between student and teacher, whereas asynchronous learning occurs through online platforms where there are no interactions (Gamage et al., 2022). In a synchronous classroom, students meet on an online video conferencing platform, such as Zoom, Microsoft Teams, or Google Hangouts. Video conferencing allows teachers and students to have real interactions, direct feedback, and closer involvement between student and

teacher in comparison to the asynchronous platform (Rojabi et al., 2022). Instructors deliver instruction in real-time, facilitating and engaging in discussions with students (Gamage et al., 2022). In contrast, in an asynchronous classroom, students work in their own time, while under the guidance of the teacher (Roach & Attardi, 2022). A common issue within asynchronous learning is the lack of engagement in the learning community (Henrikson & Baliram, 2023). There are a variety of options available for teachers and students to communicate, including the use of a learning management system (Samawi & Al-kreimeen, 2022). A learning management system is technology that stores online courses and organizes course content (Samawi & Al-kreimeen, 2022). Teachers using an asynchronous platform may upload content onto a learning management system, and students can complete the content at their own pace.

The advantage of a synchronous classroom is students may feel more connected to the teacher, therefore decreasing the transactional distance between teacher and student (Roach & Attardi, 2022). However, due to the confines of virtual education, not all students can attend live class time via online platform or have appropriate technology or computer bandwidth. Balancing asynchronous and synchronous delivery methods to reach all learners is necessary. Regardless of the mode, synchronous or asynchronous, delivery of content should be student-centered and promote peer collaboration (Gamage et al., 2022).

Lack of Engagement in Virtual Education

Online learning may present its own challenges to a variety of educators throughout the global learning community. In a study conducted by Yong et al. (2021), virtual teachers experienced an array of challenges, including unable to meet the needs of

students and unable to engage students. High-quality interactions between classroom teachers and students support learning, effort, achievement, motivation, and engagement (Alrajah & Shindel, 2020; Havik & Westergård, 2020). In fact, more than 10% of schools in the United States fail to engage students, resulting in an unproductive learning environment (Havik & Westergård, 2020). In contrast, Cevikbas and Kaiser (2022) state that 40 to 60% of students are disengaged in schools within the United States. In addition, the problem of student disengagement is increasing in various countries outside of the United States, including Australia, Finland, and France (Cevikbas & Kaiser, 2022). Feelings of alienation, loneliness, and disconnection have been identified by students who were disengaged in that virtual classroom (Muir et al., 2022). Reasons for students' lack of engagement include fewer opportunities for learner autonomy and student collaboration. A variety of factors impact student engagement including the support from fellow peers and teachers (Qi Li et al., 2022). In a study conducted by Abdullah et al. (2022), students were disengaged during lessons, showed a lack of motivation, low attendance rates, and were despondent towards the teacher and other students during opportunities of participation.

The Necessity of Engagement

Student engagement can be defined as "energy in action," as referenced by Havik and Westergård. Whereas Bollinger and Martin (2020) define student engagement as "the student's psychological investment in an effort directed toward learning, understanding, mastering the knowledge, skills or crafts that the academic work is intended to promote" (p. 404-405). Additionally, Castro and George (2021) stated student engagement is even more important in an online classroom. Student engagement, or lack thereof, contributes

to the feeling of isolation and course dropout (Castro & George, 2021; Ramli et al., 2024). While students may be separated physically, the emotional connection and sense of community is connected to student engagement (Castro & George, 2021).

Engagement may also be connected from a psychological viewpoint, where engagement is internal and depends on the sense of belonging (Spiker, 2021). The common theme amongst all researchers is engagement can be determined by the students' interactions with course content, teachers, lessons, and their peers. Several subtypes of student engagement exist, including emotional, cognitive, and behavioral (Alrajeh & Shindel, 2020; Havik & Westergård, 2020; Pedler et al., 2020; Ramli et al., 2024). Behavioral engagement includes effort, attention, ability to ask questions, and participation in lessons (Pedler et al., 2020). Whereas emotional engagement includes affective reactions within the classroom, including the sense of belonging (Pedler et al., 2020). Finally, cognitive engagement includes student autonomy, self-regulation, and investment in learning (Pedler et al., 2020). Similarly, Spiker and Ramli et al. implied students may feel a sense of belonging and feel welcome to take risks from a psychological standpoint.

Student engagement is related to learning and performance (Castro & George, 2021). If students are not engaged in the classroom, boredom, poor motivation, isolation, and low grades may occur (Alrajeh & Shindel, 2020; Ramli et al., 2024). Like Alrajeh and Shindel's claims, Castro and George stated feelings of isolation, student dropout, and retention increases when students are disengaged. Student engagement is critical in an online, synchronous classroom. Although students are physically separated from their

peers and teachers in a virtual classroom, a sense of community is connected to feelings of engagement (Castro & George, 2021).

Use of the Video Camera

In an online course, students may feel isolated (Ramli et al., 2024). The proper use of the functionalities of the technological device may assist in fostering relationships and supporting student engagement. Webcams play an integral role in a virtual classroom by decreasing the transactional distance (Dennen et al., 2022). When the transactional distance decreases, student satisfaction with the course increases. In a synchronous classroom, transactional distance can be lessened by using the webcam embedded within the user's computer or device. The webcam, also known as video conferencing, allows individuals to see each other's facial expressions, interpret moods, and feelings (Dennen et al., 2022; Rojabi et al., 2022). Rojabi et al., (2022) stated video conferencing as a communication tool that allows teachers and students to interact in real-time from various locations.

Further, video conferencing provides real interaction, effective communication, and may create a closer connection between student and teacher (Rojabi et al., 2022). Whether learning takes place virtually or in a brick-and-mortar setting, teachers need to have the opportunity to observe their students. By using the video camera, teachers may gauge their students' level of attention, understanding, and progress toward mastering the standard(s) or content (Händel et al., 2022). When the webcam is turned off, it is difficult for the instructor to provide feedback to students, as well as determining student understanding of the lesson (Händel et al., 2022).

Students who have their camera on during class time may be engaged more than students who do not have their camera on during synchronous online classes (Garris et al., 2022). Using both audio and webcams has been found to aid in developing relationships within the synchronous classroom (Dennen et al., 2022). In a study conducted by Garris et al., students expressed that when they had their camera on during live class time, they felt there was a social expectation to contribute to conversations. On the other hand, when students had their camera turned off, students reported that "[they felt] like doing whatever. So, definitely, keeping the camera on helps" (Garris et al., 2022, p. 5). Further, students noted that keeping the Zoom camera on contributed to positive engagement and an increased likelihood of classroom participation (Garris et al., 2022).

Händel et al. had similar findings in a study conducted in 2022. In this study, the researchers found student engagement increased when students had their cameras turned on during the duration of their live synchronous class (Händel et al., 2022). Additionally, Händel et al. reported teachers had difficulty determining whether students were engaged in their lesson when students' webcams were turned off. As also indicated by Dennen et al. (2022), teachers stated that when the students' webcams were off, they had difficulty gauging whether students were understanding the material.

Use of Synchronous Chat

Adapting to an online environment that supports all students can be challenging for educators. When students are disengaged in the classroom, there is an increased risk of underperformance on grade-level tasks (Nyborg et al., 2020). Virtual educators must utilize the features in their online platforms to communicate effectively with students to

increase engagement (Buckley & Nimmon, 2021; Nash et al., 2023). To aid in communicating with students on an online platform, teachers may use the chat box. The Zoom chat feature may be used to foster learning, allowing students to actively engage with others and their teacher, mimicking face-to-face discussions (Nash et al., 2023).

Benefits of utilizing the chat feature include increased participation, creating an atmosphere where students feel safe to volunteer responses, and providing more autonomy to students (Nash et al., 2023). The results of a study conducted by Goodman and Moore (2023) discovered that a moderate amount of chat interactions between students may boost confidence in learned material. Lowenthal and Moore (2020) stated students who can interact and communicate with one another can develop a stronger sense of classroom community and presence socially, which aids in the success of their online program. When virtual teachers utilize the chat features during synchronous classes, students may experience an increase of engagement by providing an unstructured space in which informal comments and socialization may occur (Nash et al., 2023). In comparison, Buckley and Nimmon (2021) stated informal conversation amongst students can aid in building a positive classroom culture, and scaffold learning.

Buckley and Nimmon (2021) argued that the use of the chat feature builds social bonding, forming a stronger classroom community, which in turn, will increase student engagement. The teacher should create an environment where students are able and encouraged to interact in a variety of methods, including nonverbal cues. Additionally, the use of a synchronous chat significantly increased student participation when utilized with an asynchronous discussion board. Teachers who used the chat feature had greater student participation and higher satisfaction results in online courses (Beeman, 2022).

Students may communicate directly with their teacher to convey ideas and express themselves through instant messages (Beeman, 2022). The research work of Beeman found that quieter students who utilized the chat box and other non-verbal participation tools had increased engagement than students who did not utilize the tools.

Silent Classrooms

Classroom teachers, either virtually or in a physical classroom, must cultivate a positive culture to increase student engagement and attitude toward learning (Oliveras-Ortiz et al., 2021). The classroom community is vital to student engagement in the virtual program. Berry (2019) stated that a sense of community is a feeling of belonging, and a shared belief that student needs will be met when together. To increase the sense of classroom community and develop a positive culture in the virtual classroom, student communication must be increased. Silent classrooms may contribute to student feelings of anxiety and the reluctance to speak up or contribute to discussions out of fear and humiliation (Wenham, 2019). The impact of silent virtual classrooms may be detrimental to students, including decreased social skills and problem-solving abilities (Choi & Walters, 2018; Ramli et al., 2024). Wenham adds that in silent classrooms, little learning takes place, as it is a teacher-centered environment, where the teacher controls the pace, sequencing, and dialogue.

Talking and discussions are critical in the classroom. Sedova and Navratilova (2020) contributed to this theory by stating there is a positive connection between classroom discourse and learning for individual students. However, Sedova and Navratilova add that it may vary by individual student and their comfort in participating in conversation. While vocal students engage in classroom conversations, non-vocal

students may have external situational factors that may contribute to their lack of talk in the classroom (Sedova & Navratilova, 2020; Wenham, 2019). Beeman (2022) stated the teacher has a significant impact on non-vocal students and their comfort level in participating in discussions. By building a strong rapport with students and sustaining a healthy classroom community, students may feel more comfortable participating in classroom discussions in comparison to a classroom culture that discourages student voice. Beeman further added that the teacher's personality had minimal effect on student participation, whereas the creation of a positive class culture had significant effect.

Teachers may use various strategies to increase communication in their classroom. For virtual teachers, increasing communication amongst students can be difficult. Encompassing a classroom that is inclusive to all learners is challenging, especially for virtual education teachers (Nyborg et al., 2020). Students who are withdrawn during class time are at risk of falling behind their peers (Nyborg et al., 2020). To promote communication for all students, virtual education teachers need to develop a culture that allows students to take risks and make mistakes (Beeman, 2022). In a study conducted by Nyborg et al. (2020), teachers participating in the study to enhance student communication had positive results when students were paired in a small group setting with their peers. Creating consistent routines and rituals in the classroom may help improve the culture and environment within the classroom (Beeman, 2022). Students who feel connected to their teacher may experience greater success than students who do not (Beeman, 2022; Morton, 2022). The relationship between classroom culture and student connectedness is linked to the rapport with the teacher, classmates, and classroom connectedness (Beeman, 2022; Morton, 2022).

Explicit Instruction in Online Classroom

Explicit instruction is used to teach a variety of skills to all learners. According to Long et al. (2021), teachers would introduce the skill using a learning target, modeling the skills, guided learning, and independent practice. Often a common instructional approach for students with disabilities, explicit instruction may aid in student engagement by allowing teachers to model proper communication and collaboration with students (Bouck et al., 2022). In a virtual platform, teachers may utilize explicit instruction synchronously or asynchronously. Explicit instruction can be delivered by instructors using a virtual whiteboard during think-a-louds synchronously, or by video asynchronously.

Bouck et al. (2022) stated there are five components of explicit instruction, including breaking tasks into manageable pieces, providing modeling and think-a-louds for students, using prompts, allowing students to engage and receive feedback, and creating opportunities for students to practice the content. During the guided phase of explicit instruction, students can solve problems on their own, while the instructor gives verbal or nonverbal cues (Long et al., 2021). In the same study, Bouck et al. determined the use of explicit instruction in a virtual classroom benefited students academically in comparison to virtual classrooms without the teacher providing explicit instruction.

Similar to Bouck et al. (2022), Long et al., (2021) stated the importance of implementing explicit instruction regularly in the virtual classroom. The regular use of explicit instruction is connected to an increase of student collaboration and retention of material. According to the results of Long et al.'s study, using technology, along with incorporating flexibility, modifications, and creativity in lessons, allows students to

achieve at a higher rate than students who do not. Using online applications, such as Nearpod, may be used during the guided learning process to increase student engagement and aid in explicit instruction (Měkota & Marada, 2020).

Nearpod is a presentation tool that allows students to independently complete interactive and engaging slides (Anggoro & Khasanah, 2022; Nearpod, n.d.). There are several activities that can be added to Nearpod presentations, including quizzes, polls, games, embedded videos, collaboration boards, and draw-it slides (Měkota & Marada, 2020). Instructors and presenters can view their student's Nearpod screen in real time, create quizzes, games, and open response questions. Teachers can determine student understanding throughout the lesson. Problems arise when students are not participating in Nearpod lessons, providing evidence of student disengagement or disinterest in the lesson (Abdullah et al., 2022). Further, Abdullah et al. stated the lack of engagement of a lesson to students results in lack of motivation, which results in poor learning gains. Designing engaging and interactive lessons through Nearpod may assist in student motivation and increase participation.

When teachers used Nearpod consistently, students showed an increase in interaction and engagement in the learning process (Abdullah et al., 2022). The advantages of using Nearpod have three notable benefits, according to Abdullah et al. Such advantages include the ability to see students' work in action, gamification features, and interactivity with other students. Also, teachers can submit feedback to students, which aids in engagement and participation (Abdullah et al., 2022; Měkota & Marada, 2020).

Students who have used Nearpod say that it was interesting and easy to use, interactive, and flexible (Měkota & Marada, 2020). Měkota and Marada, for example, performed a study which measured student participation and engagement when using the application Nearpod in a classroom setting. According to the results of this study, 62% of students said the lesson was engaging. However, in the same study, it was noted the need for collaboration during lessons. Statistically, students who solely used Nearpod and did not collaborate with their peers performed worse than students who used pencil and paper and collaborated with their classmates. Měkota and Marada noted the importance of collaboration and is an important factor for student success.

Possible Solutions

The evolution of online learning is moving at a rapid pace and is used by students of all age levels. Teaching in an online classroom is vastly different than teaching in a brick-and-mortar setting. However, the need for student engagement remains the same. Understanding what strategies to utilize in the virtual classroom is critical to determining how to increase student engagement. Developing and maintaining a positive classroom culture is connected to increased student engagement and participation during synchronous lessons (Beeman, 2022; Choi & Walters, 2018; Martin, 2019). The studies presented in this section provide evidence of the need to increase student engagement on an online platform. Many of the reviewed articles originate from the United States, Europe, and China. The common theme in these studies is the necessity to cultivate positive relationships between students and teachers and between students and students in the online synchronous classroom (Cicco, 2017; Luo et al., 2022; Martin, 2019). To aid

in developing such relationships, the need to integrate specific engagement strategies, including cooperative learning.

Promoting Student and Teacher Relationships

An online teacher must make every effort to develop a positive culture and climate. To promote engagement in an online classroom, students must feel like they are connected to a community. Relationships between student and teacher aid in developing such community (Beeman, 2022). To create a positive classroom community, a solid foundation of trust between student and teacher must be formed (Cicco, 2017). This starts with the teacher's presence and availability to students, using appropriate language to respond to various students' learning styles and comfort levels (Cicco, 2017). Interacting regularly with students is critical and aids in developing and maintaining a positive relationship with students. Beeman (2022) adds that students are reluctant to contribute to classroom discussions if they are insecure or have low self-esteem. However, a more comfortable classroom environment can positively impact student participation.

The engagement of the online instructor helps build upon the online social presence, promoting relationships between student and teacher (Bollinger & Martin, 2020). The relationship between student and teacher is the foundation of an effective classroom management plan (Martin, 2019). Proper relationships between student and teacher increases student participation and engagement (Alrajeh & Shindel, 2020). According to Keyes and Heath (2023), student belonging is connected to student engagement within the classroom. Moreover, a direct correlation exists between student academic engagement and sense of belonging (Keyes & Heath, 2023).

The sense of belonging is connected to higher cognitive and affective engagement in an online classroom (Keyes & Heath, 2023; Luo et al., 2022). In an online platform, students may feel isolated or lonely, which can affect the learning process (Luo et al., 2022; Ramli et al., 2024). Instructors who build rapport with their students are likely to have increased engagement and overall satisfaction with the course (Samawi & Al-kreimeen, 2022). The relationship between student and teacher and student and student can impact morale on a large scale (Luo et al., 2022). When students receive emotional support from their teacher, there is a positive increase in retention of material and involvement in learning activities (Beeman, 2022; Luo et al., 2022). In turn, if students have an opportunity to engage in positive and purposeful dialogue with other students in an online setting, it enhances the learning process and increases cognitive engagement (Luo et al., 2022; Martin, 2019).

In a study conducted by Luo et al. (2022), the relationship between student and teacher could serve as a predictor for student engagement during the course. The study also found that the relationship between students influences the engagement students have in the course (Luo et al., 2022). The impact of reduced collaborative discussion in online learning is connected to deeper understanding of concepts and problem-solving skills for complex tasks (Choi & Walters, 2018). Choi and Walters (2018) implied that discourse allows students to explain their reasoning, provide evidence for their claims, and allows opportunities to verify their ideas with peers. When students engage in scaffolded discussion with peers and teachers, deeper connections are created. The teacher should consider creating small groups of students to promote peer-to-peer interaction. In a study conducted by Choi and Walters (2018), students who engaged in

regular discourse had greater learning outcomes than students who did not, regardless of whether students were interacting face-to-face or virtually.

Classroom Community

There are a multitude of factors that may contribute to student disengagement during class sessions. Individual teachers can positively impact student engagement by building a strong rapport and relationship with students and maintaining a positive and welcoming classroom environment (Beeman, 2022). Wylie (2023) stated the presence of a classroom community enhances student interaction and may increase engagement. Synchronous virtual classrooms can support academic and social interaction and engagement between students and teachers (Andrew et al., 2021). Engagement supports student motivation, satisfaction, and retention of information (Andrew et al., 2021).

A predictor of engagement and an indicator of a positive classroom culture is the student's emotional response and connection to the teacher. Martin (2019) found that the key component of successfully managing a classroom is the relationship between student and teacher. In a study conducted by Martin, ten teachers were polled on what helped them manage behaviors effectively. All the teachers stated the student-teacher relationship is imperative to maintaining a positive classroom environment (Martin, 2019). Without positive relationships between student and teacher, it is likely student engagement and trust will waver. Further, students who are more connected to instructors take an active role in classroom discussions (Berry, 2019). If online instructors can create a positive classroom culture, students will feel a sense of community. By establishing classroom norms, teachers can foster and develop the type of community where students can flourish and grow personally and academically (Easley & Lehto, 2022).

The sense of community can be described as feelings that individuals belong to one another or to the overall group (Kavrayici, 2021). Like physical classrooms, the virtual classroom includes pedagogical interactions between students and teachers, and students-to-students (Kavrayici, 2021). Classroom culture is unwritten goals and rules created by the teacher and students (Cicco, 2017). There are numerous benefits derived from the classroom culture, including increased classroom participation and learning (Berry, 2019). Additionally, there are social benefits including an increased ability to manage stress and emotional well-being (Berry, 2019). Wylie (2023) added that students who feel connected to their classroom culture are less likely to withdraw from the online academic program. True engagement occurs when the learner becomes a part of the learning process and community (Piedra & Yudintseva, 2020).

A classroom community promotes strong relationships between group members. In turn, students and the instructor develop a culture where students are encouraged to share ideas, reducing isolation (McKenna et al., 2022). Developing a strong classroom community can generate long-term effects for students. Such effects include the ability to interact with a wide variety of individuals through debate, collaboration, and discussion (McKenna et al., 2022). In the online classroom, the sense of community is driven by social and emotional interactions (Martin, 2019; McKenna et al., 2022). Kenna et al., further stated that students not only feel welcome and connected to their classroom community, but they are motivated and encouraged to engage in rigorous dialogue and build relationships with their fellow classmates.

The classroom instructor is instrumental in developing a positive classroom community (Cicco, 2017). The pedagogical techniques and strategies used by the

instructor to deliver content to students are pivotal. The teacher's leadership style, communication, and interaction with students impacts student satisfaction levels and retention (Berry, 2019; Cicco, 2017; McKenna et al., 2022). The climate of a classroom pertains to how stakeholders feel or perceive their environment (Cicco, 2017). Like Cicco, Berry stated a classroom climate can be described as a feeling of belonging, where participants have a shared goal, and provide academic and social rapport with others. Kavrayici (2021) stated the teacher's classroom management techniques help solidify the classroom climate. Classroom management requires building healthy student and teacher relationships, and the sense of community is the result of a well-managed classroom environment (Kavrayici, 2021).

Student Talk

Teachers drive the delivery of instruction to their students. To enhance student engagement, the instructor must structure the class to encourage student interaction with classmates and the teacher (Henrikson & Baliram, 2023; Samawi & Al-kreimeen, 2022). The teacher should promote a communication style that allows students to voice their opinions, thoughts, and ideas freely. By providing students with the time and space to think, they can listen to and consider the viewpoints of others (Tammi & Rajala, 2018). The benefits of student talk and discussion include stronger engagement and increased participation in lessons and content (Conner, 2022; Henrikson & Baliram, 2023). According to Kahne et al. (2022), students who were more responsive and communicative reported higher grades, better attendance, and lower levels of retention.

Mitra (2018) concluded that a large body of research supports student talk in the classroom and improves classroom practice. The benefits of classroom talk for children's

learning have been well documented and is a popular trend currently in education (Khong et al., 2019; Ong & Quek, 2023). Further, through classroom discussion, various layers of learning take place, including a deeper understanding of material, and supporting cognitive growth (Khong et al., 2019). Khong et al. emphasized the significance for educators to grasp productive student dialogue while collaborating on the completion of tasks. Teacher professional development opportunities focusing on student discussion and student talk are necessary to ensure validity.

Pedagogically, teachers may need to shift their classroom management style from a power over to a power with approach to teaching and student learning (Conner, 2022). Conner further stated that a teacher may need to change their mindset on student abilities, providing students more of an opportunity to participate in, and take initiative in decision-making in the classroom. Like Conner's findings, Kennedy (2018) found that teachers who encouraged student talk in their classroom allowed them to change their perceptions of students' skills and knowledge when expressing themselves. Similarly, Premo et al. (2023) cited a significant amount of evidence that the quality of student dialogue between student-to-student and student-to-teacher contributes to the effectiveness of the lesson and material. In a study conducted by Choi and Walters (2018), students who participated in student discourse regularly in their online classroom demonstrated higher outcomes on their final course assessments and higher odds of performing at or above proficiency levels on the state's standardized assessments. Therefore, the need for teachers to encourage student-initiated dialogue.

Xiangming et al., (2022) investigated management communication style and its impact on student voice in the classroom. Management communication style refers to the

way managers speak to their employees to achieve smooth operations in a business (Xiangming et al., 2022). There is an established connection between a manager's delivery style and the employee's satisfaction (Botez, 2019; Xiangming et al., 2022). The delivery styles range from to tell, to sell, to consult, and to join. In a *to tell* delivery style, employers announce business decisions to employees, have a top-down delivery approach, and have passive compliance from employees. The *to sell* approach convinces employees to conduct business decisions and has a partially passive compliance reaction from employees, according to Xiangming and colleagues. On the other hand, consulting, according to Xiangming et al., allows employers to negotiate with employees about business decisions, motivating employees to be partially involved in the decision-making process. Finally, *joining* involves the employees in the decision making and business operations, and employees who are actively invested in the company (Xiangming et al., 2022). Xiangming et al., used the management communication style theory in an online platform, citing similarities in interactions between the teacher and student are like employer to employee.

When students have increased opportunities to contribute to classroom discourse, they are more actively involved in the lesson, which leads to stronger participation and overall achievement (Connor et al., 2020). Xiangming et al. (2022) found that teachers' excessive lecturing and dialogue during class time contributes to negative student engagement. The more the teacher controlled the content of instruction, the less frequently students were involved in the learning activities throughout the lesson. There was a positive correlation, however, between student engagement and student involvement in online learning activities (Xiangming et al., 2022).

Support Student Collaboration through Cooperative Learning

In distance education, opportunities for interactive and collaborative learning allow students to engage in meaningful conversations (Ozkara & Cakir, 2018). In a study conducted by Meyer and McNeal (2011), productivity and efficiency increased in distance education when there was increased interaction between students. Through collaborative learning, students can expand their knowledge together, allowing them to share experiences and promote more opportunities for learning and academic growth (Chadha, 2018). To begin, students need the opportunity to introduce themselves. Bollinger and Martin (2020) stated students need to get to know one another, which aids in creating a supportive, interactive, and meaningful classroom community. Further, Bollinger and Martin added that moments of reflection also aid in developing peer-to-peer relationships.

Collaboration, problem-solving, conflict resolution, and productivity are life-skills and are promoted when students are provided the opportunity to work together (Wyman & Watson, 2020). Further, according to Wyman and Watson, numerous research studies have shown the benefits of cooperative learning, including academics, increased social interaction, better motivation and self-esteem, organization. However, Wyman and Watson also stressed the importance of teacher participation. Complaints surrounding cooperative learning include intentional preparation of questions, grouping of students, and implementing cooperative learning principles into lessons (Wyman & Watson, 2020). Yet, studies have shown that cooperative learning is connected to student achievement and increased student participation (Shana et al., 2020). As a result of the COVID-19 pandemic and the shift to online learning, digital collaboration is essential for student

engagement to help with performance inside and outside of the digital classroom (Gaad, 2022).

Cooperative learning, also known as collaborative learning, is a strategy where students are divided into small groups to work together as a team (Shana et al., 2020). Due to the physical distance between online students, cooperative learning may help students overcome the feeling of isolation and disconnect (Gaad, 2022). According to Gaad, collaboration can strengthen student relationships, contribute to further understanding of material, and assist in developing interpersonal skills. Peer interaction aids in critical thinking, as each member of the team works together. Additionally, each member of the group is responsible for learning, thus creating an atmosphere requiring collaboration and student engagement (Gaad, 2022; Shana et al., 2020; Silva et al., 2022).

Gillies (2023) stated there are five basic elements of cooperative learning groups' work, including (a) positive interdependence, (b) individual and group accountability, (c) promotive interaction, (d) social skills, and (e) group processing. Positive interdependence surrounds the notion that the success of each member of the group contributes to the success of the team (Gillies, 2023; Johnson & Johnson, 2016; Silva et al., 2022). Johnson and Johnson's research found that individual and group accountability allows the team to reduce the likelihood of one individual taking advantage of or controlling the group and work of others. To succeed in cooperative learning, each member of the team is assigned a task, and must fulfill the task to successfully accomplish the task. To work together as a group, students need to develop the necessary social skills to cooperate, Silva et al. stated. Finally, group processing allows individuals to reflect on their own learning and performance (Silva et al., 2022).

To support student engagement, the classroom teacher must establish procedural norms, setting the tone for risk-taking and collaboration (Easley & Lehto, 2022). The culture inside a classroom fosters communication, allowing the classroom's community to flourish (Berry, 2019; Easley & Lehto, 2022). The relationship between student participation and teacher connectedness is profound. Beeman's (2022) research discovered that student participation is positively correlated to instructor rapport, classroom relationship, and classmate connectiveness. Through modeling, the teacher can reinforce elevated expectations for respectful collaboration, including actively listening, periodically checking for understanding, and developing a consensus before making decisions (Easley & Lehto, 2022). Additionally, by setting clear expectations, students understand the purpose of their collaboration and the procedures to support efficiency in student-led tasks. The community the teacher builds can be seen as a supportive social group, where members have a sense of belonging and shared goals (Berry, 2019).

Online tools must be utilized to help to facilitate cooperative learning. Such tools include the use of the Zoom chat box and integration of the Zoom camera, or equivalent communication software. Proper use of technology can aid students and teachers to feel more connected in the classroom, encouraging engagement and collaboration (Rojabi et al., 2022). Researchers Rojabi et al. found that students were more enthusiastic and engaged in an online classroom when their camera was turned on. Additionally, students had greater participation in discussions when their camera was turned on (Rojabi et al., 2022). In a study conducted by Beeman (2022), students who utilized the chat box through Zoom had higher levels of participation in the course. Further, Beeman adds, the use of the chat box increased the quality of participation and fulfillment of students. In

the same study, students felt more comfortable collaborating with their peers, allowing all students to participate in classroom discussions. Further, discussions through the chat feature can be instrumental in promoting a classroom community, which leads to greater learner satisfaction in an online setting (McKenna et al., 2022).

During student-led collaboration and cooperation, teachers may circulate throughout the classroom (Easley & Lehto, 2022). In a virtual setting, this may occur during the use of break-out rooms. By circulating break out rooms, teachers can intervene or extend the learning process for students (Easley & Lehto, 2022). While in break out rooms, a small group of students interact with their peers, with the intention of working together to produce results. In a study conducted by Wyman and Watson (2020), students who participated in cooperative learning in small groups showed significant learning gains, in comparison to students working independently. In addition, Shana et al. (2020) found the use of cooperative learning groups increased student engagement and had a powerful impact on improving student achievement and participation.

After students meet in their respective groups, students need to have an opportunity for reflection with the instructor. By bringing the classroom back together allows students to learn from one another and provides an opportunity to engage in guided reflection (Bollinger & Martin, 2020; Easley & Lehto, 2022). It also allows students to give productive and respectful feedback to classmates (Easley & Lehto, 2022). To support all learners, the teacher must relay the key ideas throughout the lesson, in a variety of formats, during the guided reflection. Reviewing the lesson's overall goals allows students to focus on the big idea, while allowing them to take charge of their learning process (Bollinger & Martin, 2020; Easley & Lehto, 2022).

Conclusion

Throughout the literature review, numerous studies indicated the importance of student engagement, and how teachers can support student learning and participation. This review adds to the challenges of implementing student engagement strategies into the synchronous online classroom, by illustrating the challenges and setbacks brought on by students and teachers. Closing the transactional distance is imperative to building relationships with students, emphasizing the importance of the student-teacher relationship in the online setting (Fabian et al., 2022; Reyes, 2013). Increasing student engagement in the virtual classroom is vital and necessary to increase student participation. Participation in the online classroom can be monitored using the video camera in Zoom, chat box, and participation in the interactive presentation tool, Nearpod. Wenham's (2019) position on her study has shown that silent classrooms are detrimental to student learning, leading to student anxiety and lower academic achievement.

Building and sustaining a classroom environment conducive to student engagement and participation is the goal of the researcher. A common theme within numerous articles is the importance of creating an atmosphere that promotes collaboration and student discussion (Gaad, 2022; Henrikson & Baliram, 2023; Shana et al., 2020; Silva et al., 2022; Wyman & Watson, 2020). There is evidence that the quality of student interaction contributes to the effectiveness of the online program (Conner, 2022; Premo et al., 2023; Samawi & Al-kreimeen, 2022).

Virtually, students may feel isolated and lonely, which may affect the students' involvement in lessons and performance (Beeman, 2022; Luo et al., 2021). Teachers who create an online presence of collaboration may build on students' motivation to create

relationships with their peers (Hatch, 2021). As a result, the students will have more motivation to collaborate with their classmates on teacher-assigned tasks. A solution to student disengagement, as referenced in the literature review, is the implementation of cooperative learning strategies in the online classroom. The benefits of the cooperative learning strategies include improvement to the classroom environment, developing student confidence and social skills (Shana et al., 2020).

Research Questions

1. To what extent are cooperative learning strategies effective, indicated by increased student satisfaction, in the virtual elementary classroom as measured by Zoom camera features and the presentation tool, Nearpod? (Quantitative Question)
2. How do students' feelings of engagement in a virtual classroom compare to their feelings of engagement in a brick-and-mortar classroom? (Qualitative Question)
3. To what extent does the implementation of cooperative learning strategies converge with students' feelings of engagement? (Mixed Methods Question)

Chapter 3: Methodology

The purpose of this mixed-methods study is to examine student engagement in the virtual elementary classroom. Details about the participants, method, instrumentation, procedures, and limitations are described in this chapter.

Participants

The targeted participants in this study were third grade students at a full-time virtual elementary school in the southeast region of the United States. There were 24 students in the researcher's third grade virtual classroom who regularly attend synchronous live lessons three times a week, for a total of two hours each day. Participants may have chosen to participate in only the quantitative part of the study or in both the quantitative and qualitative components. All participants needed to have parental permission to participate.

Students in the researcher's classroom were between 8 and 9 years of age, 11 students are female and 13 males. The ethnicity of students included 6 White, 7 African American, 2 Asian, and 9 Hispanic. One student received Exceptional Education Services, and three students had a 504-plan due to physical impairments.

Quantitative

The target population was comprised of third grade students in a full-time elementary virtual classroom in the southeastern region of the United States. Edmonds and Kennedy (2017) stated that nonrandom assignment of participants is needed when the researcher does not have the ability to use random assignment due to pre-existing groups. The pre-existing group in this study was the researcher's third grade students. The non-probability sampling technique that was used in this study was convenience sampling.

Sometimes referred to as accidental sampling, the researcher selected participants based on their availability and willingness to participate in the study (Creswell & Guetterman, 2019; Edmonds & Kennedy, 2017). Parents of those interested students needed to sign a written consent allowing their children to participate in the study and students will need to assent to being part of the study.

Nonprobability sampling is the most beneficial sampling technique due to the convenience and limitations of the researcher (Edmonds & Kennedy, 2017). The researcher recruited participants through an interest survey (see Appendix A) sent to their parents or guardians through e-mail. The targeted participants' parents' and guardians' e-mail addresses were accessible through the school's Focus School Software account. Once permission was granted and the students assented to participate, the targeted students completed a pretest and posttest survey using the online website, SurveyMonkey (SurveyMonkey, 2018). Twenty students were the minimum number of students needed for the quantitative portion of the study, as derived from Lipsey's Sample Size Table referenced by Creswell and Guetterman (2019) and displayed in Table 1. However, 12 students participated in the research study.

Table 1

Lipsey's Sample Size Table

Sample Size Table: Approximate Sample Size per Experimental Group Needed to Attain Various Criterion Levels of Power for a Range of Effect Sizes at Alpha = .05

	Power Criterion		
Effect Size	**.80**	**.90**	**.95**
.10	1570	2100	2600
.20	395	525	650
.30	175	235	290
.40	100	130	165
.50	45	60	105
.60	45	60	75
.70	35	45	55
.80	25	35	45
.90	20	30	35
1.00	20	25	30

Note. From "Determine Size Using Sample Size Tables," by J. W. Creswell and T. C. Guetterman, *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (6th ed., p. 668), 2019, Pearson. Copyright 2019 by Pearson.

Qualitative

The targeted participants for this part of the study included students enrolled in the researcher's virtual third grade classroom who had expressed an interest in participating in the Zoom interview and who have completed the quantitative section of the study. Four students indicated their willingness to participate in this phase of the study. When collecting qualitative data, the researcher must identify the site of the study and individuals of interest in the study (Creswell & Guetterman, 2019; Edmonds & Kennedy, 2017). Purposeful sampling was used to recruit participants. Creswell and Guetterman (2019) described that researchers use purposeful sampling to intentionally

select individuals to better understand a phenomenon. The specific type of purposeful sampling that was used in this study was concept sampling. Concept sampling is a strategy in which the researcher samples sites or groups of people to generate a theory or specific concepts within a theory (Creswell & Guetterman, 2019). The researcher used this sampling strategy due to the theory that the use of cooperative learning strategies will increase student engagement within the virtual classroom.

The researcher selected participants for the qualitative part of the study with the the consent of their parents or guardians, obtained via an interest form through e-mail (see Appendix A). Students who agreed to the study and who have had parental permission to participate completed a Zoom interview. The researcher's goal was to gain insight on the students' perception of engagement and how it compared to their experience in a brick-and-mortar classroom if they have attended a brick-and-mortar classroom in prior years.

Instruments

The quantitative data for the first phase of the mixed-methods study was collected using questions created by the researcher based on the survey entitled *Elementary Student Engagement Survey: Student Response* (American Institutes for Research, 2023). This survey is free to access and is used for research purposes to understand student engagement within the individual, classroom, and school levels (American Institutes for Research, 2023).

The researcher selected to use this survey as a model to draft her own questions based on the survey covering the four domains of engagement, including emotional, social, behavioral, and cognitive (Vail & Leary, 2022). In the survey used in this study,

the researcher asked participants questions on three out of the four domains of engagement: emotional, social, and cognitive. The researcher omitted the behavioral domain due to the overall focus of this research project surrounding the emotional, social, and cognitive domains. Creswell and Guetterman (2019) explained validity is used to demonstrate that the test interpretation matches the proposed use. Omitting the behavioral domain did not affect the validity of the survey due to the other three domains not being impacted.

The survey (see Appendix B) had a total of 10 questions, using a 4-point Likert scale, ranging from strongly agree to strongly disagree. Creswell and Guetterman (2019) stated that the researcher must develop multiple response options to normally distribute the data and establish an equal distance between each value. Therefore, respondents made choices on the scale from strongly agree to strongly disagree for all 10 questions. The score criteria that were used in this study was single-item scores. Single-item scores are individual scores for each participant of the study (Creswell & Guetterman, 2019). The researcher used this approach to tie into the second phase of this study, the qualitative interview phase.

Elementary Student Survey: Engagement During Class Time

The survey, designed after the *Elementary Student Engagement: Student Response* created by the American Institutes for Research (2023), encompassed the four domains of engagement, including emotional, social, behavioral, and cognitive. The researcher omitted the behavioral domain due to it not contributing to the overall purpose of this study. Questions 1, 2, 3, and 10 captured the students' feelings about their school and sense of belonging within the classroom, contributing to the domain emotional

engagement (See Appendix B). Items 4, 7, and 8 targeted social engagement, addressing how students connect with their teacher and classmates (See Appendix B). Finally, cognitive engagement was referenced in items 5, 6, and 9. These three items determined student usage of online tools during live class time that contributed to cognitive engagement, as well as student perception of the usage of cooperative learning strategies. The items were rated on a 4-point scale, ranging from strongly disagree to strongly agree.

Survey validity was demonstrated when a test interpretation matches the proposed use (Creswell & Guetterman, 2019). The student engagement survey used in this study is modeled after the survey, *Elementary Student Engagement: Student Response* created by the American Institutes for Research (2023). The *Elementary Student Engagement: Student Response* survey was developed and adapted by several validated surveys, including but not limited to the Alaska School Climate and Connectedness Survey, the AIR Conditions for Learning Surveys, and the REACH Survey from the Search Institute (Vail & Leary, 2022).

The Elementary Student Engagement: Student Response survey demonstrated strong reliability. As Vail and Leary (2022) stated, the composite score for the survey demonstrated a Cronbach's alpha > 0.70, and Rasch > .70 across each aspect of the survey. Both Cronbach's alpha and Rasch are on a scale of 0-1, which indicates higher values indicate a higher reliability (Vail & Leary, 2022).

Engagement Interview

The engagement interview will be conducted over the web-application, Zoom. The researcher's virtual school utilized Zoom for all synchronous courses. Zoom was selected due to its ease of use, recording, and transcription services (Zoom, n.d.). The

researcher developed the engagement interview questions based on the *Elementary Student Engagement: Student Response* survey created by the American Institutes for Research (2023). The *Elementary Student Engagement: Student Response* survey surrounded the four key elements of engagement, including emotional, social, cognitive, and behavioral (Vail & Leary, 2022). The interview questions were validated by the response processes of the participants. Creswell and Guetterman (2019) stated validity is greater when the researcher observes participants responding to the instrument in a similar manner.

Only participants who consented to participate in the interview and received authorization from their parent or guardian participated in the virtual interview, as required by institution's Institutional Review Board (IRB) because of the minors' age (Cotrim et al., 2021). The questions in the interview were open-ended, which allowed the researcher to gain insight of the student's perception of cooperative learning strategies within the virtual classroom. In total, there were 13 questions (See Appendix C). All students who participated in the interview engaged in the first 10 questions.

The first 10 questions in the interview converge with the quantitative research question of this study. The aim was to uncover if cooperative learning strategies were effective, as indicated by increased student satisfaction and perception and student usage of the presentation tool, Nearpod. Students' open-ended responses allowed the researcher to gain a deeper understanding of students' perception of engagement and whether they believed it contributed to additional Nearpod and Zoom features usage during synchronous classes. The last three questions were only to be asked to students who have attended brick-and-mortar schools in the past. These questions are a reference to the

second research question, determining how students' feelings of engagement in a virtual classroom compared to their feelings of engagement in a brick-and-mortar classroom. Student responses to questions 11 through 13 provided a deeper understanding of their feelings of engagement and how it compared to different settings, whether virtual or in person.

Procedures

After IRB permission had been received to undertake the study and after parents had consented and students have assented to participate in the study, the researcher began data collection for the study. The data for this mixed-methods study was collected through a pretest and posttest survey using the website, SurveyMonkey, and a virtual interview using the online web-conferencing application, Zoom, as noted in the previous section. The data was collected and analyzed by the researcher. The researcher used both quantitative and qualitative methods to provide insight into the effectiveness of engagement strategies in the virtual elementary classroom. The mixed-methods approach allowed the researcher to gain an understanding of how students perceive engagement during synchronous lessons. Student responses were kept anonymous. The researcher used a unique identifier instead of a name for each answer and username.

Research Design

This mixed-methods study followed a sequential explanatory design. Creswell and Plano Clark (2017) explained that the explanatory design is best suited when the researcher needs qualitative data to explain significant or insignificant quantitative results. The researcher selected this design as a method to better understand students' perception of engagement. Creswell and Guetterman (2019) stated the researcher who

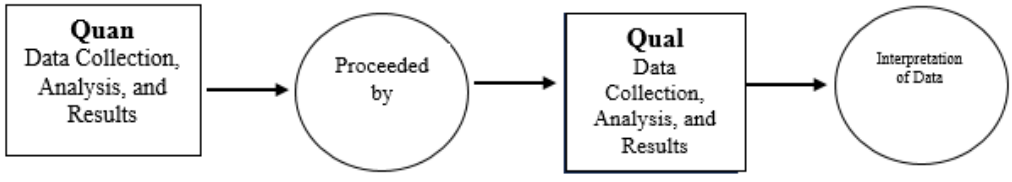
uses this method may use the qualitative data to refine the results of the quantitative data. The researcher's interview with students provided an in-depth analysis of student engagement, refining the results from the quantitative data (Creswell and Guetterman, 2019).

A sequential explanatory mixed methods design allowed for conclusions from quantitative data and lead the researcher to formulate interview questions for the qualitative component of the study (Creswell & Plano Clark, 2017). After acquiring quantitative data, the researcher implemented the qualitative phase, by collecting and analyzing qualitative data (Creswell & Plano Clark, 2017). In the final phase, the researcher analyzed the results and interpreted to what extent the qualitative results were related to the quantitative results (Creswell & Plano Clark, 2017).

Creswell and Plano Clark (2017) stated there are two points where integration occurs in a sequential explanatory mixed methods research design. The first point is where integration occurs between the quantitative data analysis in the first phase of research to the qualitative data collection in the second phase of research. The researcher then analyzed the results. The second phase occurred when the researcher connected the results and drew conclusions based on how the qualitative results extended to the quantitative data (Creswell & Plano Clark, 2017). Figure 1 provides a visual of the sequential explanatory design of this mixed methods study.

Figure 1

Sequential Explanatory Mixed Methods Design



Quantitative Data Collection

The data for the quantitative portion of this mixed-methods study was a cross-sectional survey design. Edmonds and Kennedy (2017) stated that a cross-sectional survey design allows the researcher to collect data at one point in time. The most common rationale of using such a design is to gather opinions or attitudes from one group (Edmonds & Kennedy, 2017). This research design is the most appropriate for the researcher to analyze the relationship between student engagement in the virtual classroom and its connection to cooperative learning strategies. The survey instrument that was used was the online survey tool, SurveyMonkey. SurveyMonkey is an online survey and form website, regularly used by researchers, and is HIPPA compliant (SurveyMonkey, 2018). The researcher selected SurveyMonkey due to its analytics, data export features, and privacy regulation. Prior to completing the survey, targeted students had a consent form completed by their legal parents or guardians, granting permission to be used in the study. An e-mail message was sent to the parents of the participants with a link to the online survey.

Before completing the survey, students received an e-mail explaining the rationale for the study and were notified that their participation was voluntary, and they may opt out of the study at any time (See Appendix A). The e-mail addresses of parents or guardians were obtained by the researcher's organization's Focus School Software account. The pretest and posttest survey took approximately 15-20 minutes to complete. Kost and Rosa (2018) stated that shorter surveys were more reliable and produced a higher response rate in comparison to longer surveys.

Students who participated in the study took the pretest survey before cooperative

learning strategies were implemented during synchronous classes. Cooperative learning strategies that were integrated were the implementation of breakout rooms in Zoom, where each student in a group was provided a task to assist with accountable individual contributions and efforts (Wyman & Watson, 2020). After 4 weeks of implementing cooperative learning strategies, the researcher resent the survey for targeted participants to complete (See Appendix B). The researcher analyzed the results of the pretest and posttest to determine if there was a change in data.

Qualitative Data Collection

Through the second phase of the data collection, the qualitative approach that was used were interviews. The researcher used the six steps commonly used in analyzing qualitative data. The six steps included preparing and organizing data, exploring the data through the process of coding it, using the codes to develop a general picture of the data, representing the findings through narratives and graphics, interpreting the meaning of the results through reflection and its relevance to the literature, and conducting strategies to validate the findings (Creswell & Guetterman, 2019). Interviews were used to gain a further understanding of students' perception of engagement and whether cooperative engagement strategies increased their usage in the presentation tool, Nearpod and Zoom features. Creswell and Guetterman (2019) stated open-ended questions allowed the participants of a study to best voice their experiences and perspectives.

The interviews were held via Zoom, and each interview lasted approximately 20 minutes. Muassomah et al. (2023) stated interviews that last longer than 30 minutes with children as participants may result in boredom or off-task behavior. The Zoom interviews were recorded, transcribed, and stored into the Zoom Cloud. The Zoom Cloud is an

internal database where individuals may record a meeting video and audio and can be streamed or downloaded onto the computer's browser (Cloud Recording in Zoom Room, 2023). The researcher used Zoom's transcription services used in the recordings and saved the transcripts in a Word Document. Upon receiving the transcription of the interview through Zoom, the researcher used the data analysis software Atlas.ti to aid in analyzing the transcripts for codes and themes. Atlas.ti is a qualitative research tool that is used for coding and analyzing transcripts (Atlas.ti, 2023). The transcripts were used to determine themes or categories to answer the second research question. Additionally, themes derived from the transcripts were also used to converge with the quantitative data to answer the third research question.

Quantitative Data Analysis

For the analysis of the quantitative data, the researcher used descriptive statistics to analyze and study the data. Descriptive statistics involves organizing, summarizing, and presenting data to describe and understand various information in a dataset (Creswell & Plano Clark, 2017). In the study, measures of central tendency were used to find the mean of the results of the surveys. Recoding and computing were completed with the use of the statistical computer program, SPSS software (IBM, 2023). SPSS software enables users to visually analyze data and has a reputable reputation for its data analysis (Creswell & Plano Clark, 2017; IBM, 2023).

Qualitative Data Analysis

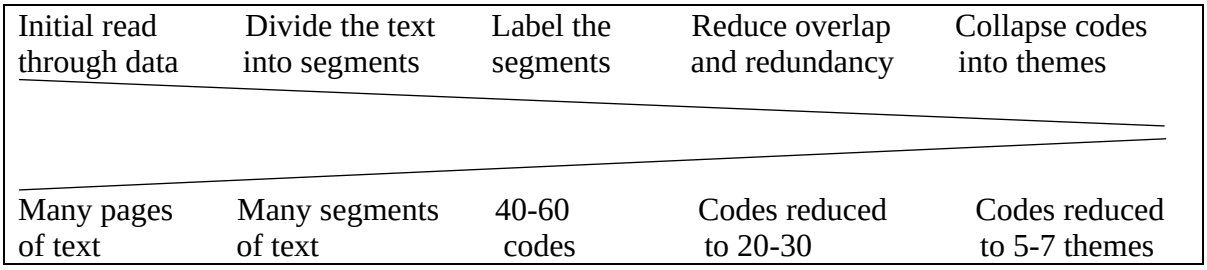
For the qualitative phase of this research study, the researcher used interviews. Interviews were audio taped, transcribed, and coded for possible themes. After the data was collected, the researcher explored the data by preliminary analysis. Preliminary

exploratory analysis, according to Creswell and Guertterman (2019), consists of exploring the data to obtain a general sense of the data. It is recommended by Creswell and Guetterman to read through the transcripts several times and immerse themselves in the details. The researcher wrote notes and used a coding process to make sense of the data. By using a coding process, the researcher made sense of the transcription, and examined the codes for overlap and redundancy (Creswell & Guetterman, 2019). After the transcription of the interviews, the researcher reduced the codes to 3 possible themes and trends. Figure 2 displays the visual model of the coding process that was used in this study, as created by Creswell and Guetterman.

Creswell and Guetterman (2019) stated themes are similar codes that are aggregated together to form a major idea. The researcher compared the findings to the quantitative phase for validation of invalidation of the findings from phase one. After the interviews were conducted, the researcher shared the recording with participants and their parents or guardian to ensure its validity. The interviews were conducted towards the latter end of the research study.

Figure 2

Coding Process



Note. From “Analyzing and Interpreting Qualitative Data,” by J. W. Creswell and T. C. Guetterman, *Educational Research: Planning, Conducting, and Evaluating Quantitative*

and Qualitative Research (6th ed., p. 280), 2019, Pearson. Copyright 2019 by Pearson.

Data Integration

This mixed-methods study was developed in two phases. The primary method for this study was based on the first phase, the quantitative phase. The qualitative component of this study was to determine how students feel about the engagement strategies introduced by the researcher and whether their participation increased during live lessons. The data was integrated by connecting one set of data to the other. The qualitative phase of the sequential explanatory mixed methods design was used to explain the quantitative results (Creswell & Guetterman, 2019).

The procedure of integrating the data occurred in three phases. The first phase was to analyze the quantitative data from the initial survey, the second phase was to analyze the second survey from the quantitative phase, and the third phase was to analyze the qualitative data to help explain the quantitative data from the mixed methods research question (Creswell & Plano Clark, 2017). Creswell and Plano Clark (2017) stated the importance of developing a table or graph that jointly displays how the qualitative results explains the quantitative results.

Creswell and Plano Clark (2017) stated the purpose of the integration of a mixed methods sequential explanatory design is to connect the quantitative and qualitative phases, so the qualitative phase provides explanations of the quantitative data. Further, the intent is to bridge the quantitative results with qualitative data (Creswell & Plano Clark, 2017). At the end of the study, the connected results were used to answer the mixed methods question: To what extent does the implementation of student engagement strategies converge with students' feelings of engagement?

Chapter 4: Results

Introduction

The purpose of this explanatory sequential mixed methods study was to (a) determine whether cooperative engagement strategies increase student participation during synchronous virtual live lessons, (b) determine how students' feelings of engagement in a virtual classroom compare to their feelings of engagement in a brick-and-mortar classroom, and (c) explore how implementation of engagement strategies converge with student perceptions of engagement. Chapter 4 expands on the methodology applied to answer the research questions. A pretest and posttest survey were used to collect data using a modified version of *Elementary Student Engagement: Student Response* survey (see Appendix B). Both quantitative and qualitative results are presented in this chapter.

Quantitative Data Collection and Analysis

Research Question 1: To what extent are cooperative learning strategies effective, indicated by increased student satisfaction, in the virtual elementary classroom as measured by Zoom camera features and the presentation tool, Nearpod?

Research question 1 sought to determine whether cooperative engagement strategies increase student participation, satisfaction, and engagement in Nearpod and increase use of Zoom features. Ten items in the survey were examined which pertained to this research question. The survey used a four-point Likert scale, ranging from 1 (low) to 4 (high). Descriptive statistics were used with multiple response frequencies and means testing to assess the 10 items.

The target population for this study were students enrolled in the researcher's

third grade classroom. The researcher had a total of 24 students when the researcher began her study. The school's organization approved permission to conduct the study after IRB approval. All 24 students were contacted by their parents and learning coaches' e-mail addresses on file through the Focus Software account. Both assent and consent forms were required to be completed by the student and learning coach before students received access to the pretest survey. The response rate among parents willing to allow their children to participate in the study was low. Out of 24 students, 12 students expressed interest in participating in the study.

All 12 students completed the quantitative portion of the study. Four out of 12 students expressed interest in participating in the qualitative phase of the study. All participants had the option to opt out of participation at any time during the study, and participant anonymity was ensured throughout the course of the study.

The pretest and posttest surveys were administered online through the software, SurveyMonkey. The survey consisted of 10 Likert-scale items. The overall response rate was 100% for the pretest and posttest surveys. The data in the surveys was analyzed according to the research procedures outlined in Chapter 3. Chapter 4 presents the results obtained from the analysis of the study, which are depicted in tables and graphs for clarity and ease of interpretation.

Participants

As shown in Table 2, participants consisted of 12 students, 5 boys and 7 girls. Out of the 12 participants, 5 students were identified as White, 3 as African American, 2 as Asian, and 2 as Hispanic. Out of 12 students, 3 students have been previously enrolled in a brick-and-mortar classroom. None of the students received special education services,

including Individualized Education Plan (IEP) or a 504 plan. One student is an English Language Learner.

Table 2

Participants' Characteristics

Baseline characteristic	Participants	
	n	%
Gender		
Female	7	58
Male	5	42
Total	12	100.0
Race/Ethnicity		
White	5	42
African American	3	25
Asian	2	16.5
Hispanic	2	16.5
Total	12	100.0

Pretest Survey Results

All 12 students completed the pretest survey through the online survey software, SurveyMonkey. The survey was designed after the American Institutes for Research (2023) survey, *Elementary Student Engagement: Student Response*. The researcher focused on the emotional, social, and cognitive domains. Questions 1, 2, 3, and 10 analyze students' feelings about school and their sense of belonging. Items 4, 7, and 8 explore social engagement and connections with classmates and their teacher. Cognitive engagement was the intent of questions 5, 6, and 9. The purpose of these questions was to determine if cooperative learning strategies increase usage of online tools, such as Zoom features and Nearpod. The overall purpose of the pretest survey was to capture student perception of live class time before the researcher's intervention of cooperative learning strategies. The posttest survey was conducted after a timeframe of 4 weeks of intervention.

The researcher utilized the statistical computer software, SPSS to analyze the data. Mean testing findings for the pretest survey are presented in Table 3.

Table 3

Pretest Survey Results

Questions	*M*	*N*	*SD*
I feel like I am part of my school.	3.33	12	0.651
I feel that I am a valued member of my classroom community	3.33	12	0.788
I am comfortable asking Mrs. Clarke for help when I need it.	3.50	12	0.674
I have friends within my classroom that I can talk to.	2.83	12	1.11
During class time, I participate regularly by turning on my Zoom camera.	3.33	12	0.888
During class time, I regularly participate with presentation tool, Nearpod.	3.25	12	0.754
When I can, I participate during class time by talking with my peers to solve questions.	2.91	12	0.996
Mrs. Clarke provides time for me to collaborate with my peers to solve problems.	3.41	12	0.792
The use of cooperative learning strategies has helped me solve complex problems with my peers.	2.75	12	1.165
I feel good about attending live class time.	3.58	12	0.514

The mean testing in Table 3 revealed that students are comfortable asking the researcher for help (100%; 12/12) by answering either “agree” or “strongly agree” on the survey. Four of 12 participants (33%) feel they have friends to talk to and disagree or strongly disagree that cooperative learning strategies enable students to solve complex problems. Before the intervention, 75% (9/12) students regularly used their Zoom camera and 83% (10/12) students participated in the presentation tool, Nearpod.

Posttest Survey Results

After the fourth week of implementation of cooperative learning strategies during live class time, the researcher provided all participants with the posttest survey through the online survey program, SurveyMonkey. All 12 participants completed the survey.

The researcher analyzed the posttest survey data through SPSS using descriptive statistics. The results of the survey are provided in Table 4.

Table 4

Posttest Survey Results

Questions	*M*	*N*	*SD*
I feel like I am part of my school.	3.41	12	0.515
I feel that I am a valued member of my classroom community	3.41	12	0.514
I am comfortable asking Mrs. Clarke for help when I need it.	3.67	12	0.492
I have friends within my classroom that I can talk to.	3.08	12	0.669
During class time, I participate regularly by turning on my Zoom camera.	3.42	12	0.792
During class time, I regularly participate with presentation tool, Nearpod.	3.42	12	0.514
When I can, I participate during class time by talking with my peers to solve questions.	3.33	12	0.492
Mrs. Clarke provides time for me to collaborate with my peers to solve problems.	3.25	12	0.622
The use of cooperative learning strategies has helped me solve complex problems with my peers.	3.33	12	0.651
I feel good about attending live class time.	3.50	12	0.522

The mean testing in Table 4 showed students are comfortable asking the researcher for help (92%; 11/12) by answering either “agree” or “strongly agree” on the survey. Ten of 12 participants (83%) feel they have friends to talk to, which is an increase from the pretest survey (8/12; 67%). Eleven students agreed that the use of cooperative learning strategies allowed them to solve complex problems (11/12; 92%), which is quite an increase from the pretest survey (8/12; 67%). Regarding the use of Zoom features,

83% of students answered they regularly turn their camera on, which is an 8-point increase from the pretest survey (75%; 9/12). The posttest survey showed that 100% of students regularly participate in Nearpod, a 17-point gain from the pretest survey.

Pretest and Posttest Comparison

Upon completion of both surveys, the researcher utilized a dependent *t*-test. Edmonds and Kennedy (2017) stated that a dependent *t*-test, also known as a paired *t*-test, is used to examine the mean differences between two variables of the same group of people. Once data was collected from the posttest in SurveyMonkey, the researcher imported the data into SPSS. The data was compared to the pretest means using a paired sample *t*-test. The null hypothesis for the *t*-test is that no differences exist between the two groups (Edmonds & Kennedy, 2017). The hypothesis will either be confirmed or denied, based on the analysis.

The purpose of the first research question was to determine if cooperative learning strategies increase student participation, satisfaction, and engagement in Nearpod and increase use of Zoom features. A total of 12 students completed the pretest and posttest. The mean pretest score was 3.22, while the mean posttest score was 3.38. A paired-sample *t*-test revealed a statistically significant difference between the two samples, (t (9) = 2.314, $p < .05$). Cohen's d effect size was medium between the two samples (d = 0.732). The null hypothesis is rejected due to the data supporting a statistically significant difference between the pretest and posttest scores.

Qualitative Data Analysis and Results

Research Question 2: How do students' feelings of engagement in a virtual classroom compare to their feelings of engagement in a brick-and-mortar classroom?

The qualitative phase of this mixed methods study was conducted by interviewing participants whose parents' granted permission for them to be interviewed by the researcher. Both consent and assent forms must have been completed by the child and parent or guardian prior to the interview. Out of 12 participants, the parents of four participants gave permission by e-mail for their child to be interviewed. The four participants were interviewed by the researcher via Zoom meetings. The researcher used pseudonyms for each participant to protect their identity (the pseudonyms are Student A, Student B, Student C, and Student D). The interview was recorded and transcribed using Zoom's transcription services.

Once the interviews were completed, the researcher used the qualitative research tool Atlas.ti to code and analyze the transcripts. Themes were established and derived from the codes the researcher used after inputting the transcripts into Atlas.ti. The major themes that emerged from the four participants were collaboration, peer support, and engagement.

Collaboration

Collaboration was a reoccurring theme for all four participants. The participants reported that collaboration with their classmates was beneficial to their learning process. Student C acknowledged the challenge that not all students participated during the use of the researcher's cooperative learning strategies. However, Student B surmised that when working on complex problems "you may feel stuck on a question, so you can ask a friend, or a classmate, and get feedback on your answer. And if you are unsure about an answer, people can agree or respectfully disagree with you."

Similarly, Student D commented "when we're in a breakout room, I would say, 'I

don't understand this. Can you guys help?' And they would share their ideas and help you understand what we are learning." Although Student C acknowledged that one classmate did not regularly collaborate, Student C commented that "when we are in break-out rooms we do talk a lot and I feel like we are more engaged" in comparison to whole-group instruction. Student A had a similar response and indicated "we were working as a team, and someone did one question and the other people did the other ones. And we would say if we respectfully agreed or disagreed."

Peer Support

Peer support was a reoccurring theme throughout the interviews. All four participants indicated that they developed friendships after the implementation of cooperative learning strategies. Student C stated, "I can interact with my classmates and have actual conversations." Like Student C, Student A stated she liked when the researcher used cooperative learning strategies because she knows she "already has friends in the classroom." Student B had similar responses and commented:

> There are people who can interpret stuff very well, and people who can understand it better than I can sometimes. And sometimes I just get tripped up to where I am rereading a question 1,000 times trying to figure out what to do. And it is nice just having someone who can help you out with that kind of stuff.

All four students indicated throughout the interview that they feel more comfortable sharing ideas with their peers.

Engagement

Engagement was the final theme derived from the interviews. Student D commented the following about cooperative learning strategies:

> Because you get to share your opinion, and you can actually tell [your classmates] what you feel. And you get to have fun. And you get to interact with people, because usually in most virtual schools, you just listen to the teacher […] and you do not get to use the [Zoom] chat box. You don't get to actually have that interaction like you probably would in real school. So that is what I like about it [the learning strategies]."

All four students expressed they felt more engaged in Nearpod and utilized Zoom features more because of the intervention. Student A and Student B both stated the use of Nearpod "helps me a lot." Student D elaborated more and said the use of Nearpod "helps us. It helps us show our work." Regarding the use of Zoom features, Student C commented that she "always have my camera on. So [you] know that I am active in class." Student B had a comparable response and stated that the Zoom camera feature allows him to see the reactions of other students.

Brick and Mortar Responses

Out of the four interviewees, three students attended a brick-and-mortar classroom prior to attending virtual school and were asked questions 11-13 on the *Elementary Student Engagement: Student Response* (See Appendix C). Student A commented that her previous classroom teacher did not use structured learning strategies but did encourage students to work with classmates. Student A stated in her previous classroom "you can choose to work with other people, or you can work by yourself."

Student C stated that when she attended her previous school, she "did not really engage that much […] and I feel like we are more engaged here." Student D had a comparable response. She stated, "it is more [traditional] instead of being cooperative and

working together. It is less engagement and more physical learning face to face."

Alignment of Quantitative and Qualitative Results

Research Question 3: To what extent does the implementation of cooperative learning strategies converge with students' feelings of engagement?

The researcher cross-referenced the qualitative results with those of the quantitative phase to validate or refute them. The themes that were derived from the qualitative data analysis were consistent with the results from the quantitative data. Participants who completed the pretest and posttest surveys and participated in the interview indicated that they felt more engaged after the intervention of cooperative learning strategies. The interviews highlighted the positive impact of the intervention, emphasizing collaboration, peer interaction, and further engagement in Nearpod and utilizing Zoom features. The convergence between the qualitative themes and quantitative results corroborates the effectiveness of cooperative learning strategies in the virtual classroom.

To summarize, quantitative analysis included means testing and a *t*-test between two surveys. Interviews were conducted for the qualitative phase of the study. The qualitative findings corroborate the quantitative results. In Chapter 5, a summary, discussion of findings, interpretation of findings, implications, limitations, and recommendations is provided.

Chapter 5: Discussion

The purposes of this study were to (a) determine if cooperative engagement strategies increase student engagement as measured by increased usage of Zoom features and Nearpod, (b) explore how students' feelings of engagement in a virtual classroom compare to their feelings of engagement in a traditional brick and mortar classroom, and (c) to investigate how the implementation of student engagement strategies converge with students' feelings of engagement. The quantitative and qualitative data are displayed according to the research questions. The findings of this sequential explanatory mixed method design are presented in Chapter 4. Chapter 5 consists of the analysis of the quantitative and qualitative research questions, discussion of the findings, implications of the findings, study limitations, and recommendations for future research.

Summary of the Study

The purpose of this mixed methods study was to determine whether cooperative learning strategies increase student participation as measured by student satisfaction, use of Zoom features, and Nearpod usage. The researcher utilized a sequential explanatory mixed method, collecting quantitative data first and explaining the quantitative results with in-depth qualitative data (Creswell & Plano, 2017). A pretest and posttest survey were used, and interviews were conducted to gather data.

This mixed methods study aimed to investigate the impact of cooperative learning strategies on student participation in a virtual elementary classroom. The virtual school district will be provided recommendations by the researcher because of this study. The study covered the following research questions.

1. To what extent are cooperative learning strategies effective, indicated by

increased student satisfaction, in the virtual elementary classroom as measured by Zoom camera features and the presentation tool, Nearpod?

2. How do students' feelings of engagement in a virtual classroom compare to their feelings of engagement in a brick-and-mortar classroom?
3. To what extent does the implementation of cooperative learning strategies converge with students' feelings of engagement?

Participants in this study were minors and enrolled in the researcher's third-grade virtual classroom. All 24 students in the researcher's classroom were invited to participate in the study; however, 12 students expressed interest. Out of the 12 students, four students volunteered to participate in the qualitative portion of the study.

Discussion of the Findings

As noted in Table 1, the study participants were a mixture of girls and boys of differing ethnicities, all attending the same live class. The findings for research question 1 revealed that the implementation of cooperative learning strategies increased student satisfaction as measured by comparing the means of the pretest and posttest surveys. Students who engaged in cooperative learning strategies during the 4-week intervention had opportunities to be actively involved with classmates, enabling a higher sense of belonging and engagement (Luo et al., 2022).

Students who participated in the qualitative portion of the study had similar sentiments as presented in the quantitative phase. All four participants reported an increase in their participation in Nearpod and Zoom, as well as collaborating more with their peers. Therefore, the convergence observed from the qualitative themes and quantitative results provides robust support for the effectiveness of cooperative learning

strategies in the virtual classroom.

Interpretation of Findings

Research Question 1. *To what extent are cooperative learning strategies effective, indicated by increased student satisfaction, in the virtual elementary classroom as measured by Zoom camera features and the presentation tool, Nearpod?* The results from this research question were derived from the pretest and posttest surveys. The findings revealed that there is a significant statistical difference in engagement survey scores from the pretest to posttest, as revealed by the paired t-test in Chapter 4 (t (9) = 2.314, $p < .05$).

Research Question 2. *How do students' feelings of engagement in a virtual classroom compare to their feelings of engagement in a brick-and-mortar classroom?* Students who previously attended a brick-and-mortar classroom were asked the remaining three questions in the *Elementary Student Engagement: Student Response* Interview (See Appendix C). Out of four participants, three students qualified to respond to these questions. Two out of three students did not feel as engaged in their previous brick-and-mortar classroom. As stated in Chapter 4, Students C and D both indicated that they did not feel as engaged in their previous brick and mortar classroom. Student A stated that although she was able to engage with classmates regularly, her previous teacher did not utilize structured cooperative learning strategies.

Research Question 3. *To what extent does the implementation of cooperative learning strategies converge with students' feelings of engagement?* The themes extracted from the qualitative data analysis resonated closely with the outcomes derived from the quantitative results. Participants who completed both the pretest and posttest

surveys and engaged in interviews reported a heightened sense of engagement following the implementation of cooperative learning strategies. Students reported an increase in involvement and interaction with Zoom features and the presentation tool, Nearpod. Also, participants expressed an increase of collaboration with other students after the implementation of cooperative learning strategies.

Implications of the Study

The implications of the results of this study may motivate and encourage other virtual teachers to explore strategies to strengthen student voice and engagement. The findings of this study may provide educators of all levels of academia to motivate their students to think critically and deliberately, all while supporting students to engage in thought-provoking conversations with fellow classmates. Silva et al. (2022) stated that critical thinking skills are essential for success, and cooperative learning strategies may strengthen such skills. The continuous usage of cooperative learning strategies may provide students with opportunities to express their understandings and communicate difficulties (Gillies, 2023).

The observed increase in student satisfaction emphasizes the importance of incorporating cooperative learning strategies into the instructional design of virtual education. By providing opportunities for cooperative learning experiences, students will experience a supportive learning environment that promotes peer interaction and active participation. The findings from this study suggest that fostering a sense of belonging and community in the classroom is essential and is supported by using cooperative learning strategies. Virtual education has become embedded in the fabric of modern education. If ineffective online learning continues, it could hinder students' learning and wellbeing

(Ong & Quek, 2023).

Limitations of the Study

A limitation to this study is the participant size. The study is limited to one virtual classroom and one teacher. Silva et al. (2022) stated small participant size may be seen as a limitation. Additionally, Graus and Enrique (2023) stated that the size of a sample can greatly impact the reliability and accuracy of the findings of a study. Graus and Enrique implied the larger the sample size, the more accurate the results, due to a broader representation of the population. The data points obtained in this study are limited in quantity. Therefore, the findings in this study cannot be generalized to the entire population (Edmonds & Kennedy, 2017). Additional studies may present different findings if the participant size is greater.

In the virtual classroom, external factors may affect student participation during live lessons. Learning coaches may interfere during live lessons, which may have impacted the results of the study. Such interference may result in a threat to external validity of the study, due to interaction of the setting and treatment (Creswell & Guetterman, 2019). There may be concerns about the integrity and reliability of the data due to external influences. Without adequate controls in place, the validity and reliability of the study's findings might have been compromised.

Another potential limitation is the use of open-ended questions. Targeted students may not understand the questions asked or may have different interpretations. Open-ended questions allow the participants to best voice their opinions and experiences without probing from the researcher (Creswell & Guetterman, 2019). The disadvantage to open-ended questions is it provides information filtered by the interviewer and may be

interpreted differently by the researcher (Edmonds & Kennedy, 2017).

A fourth limitation may be the role of the researcher. The researcher in this study is the teacher of the targeted participants. Participants may have strived to answer questions to please the researcher, due to their role as the researcher's students. According to Edwards and Kennedy (2017), this may be a threat to the construct validity of the study due to the participant's reactivity of the assessment.

Recommendations for Further Research

As a result of this study, the first recommendation is to encourage educators, specifically virtual educators, to employ cooperative learning strategies in their live lessons. Mentorship and training are needed beforehand to ensure the strategies are implemented correctly. Proper guidance and support can allow educators to understand how to effectively integrate these strategies into their own classroom. Although the sample size of this study was inadequate, the study supported the notion that cooperative learning strategies have a positive impact on student engagement. In a research study conducted by Shana et al. (2020), the implementation of cooperative learning strategies showed an increase of students' self-esteem and strengthened their understanding of content. Shana et al.'s study highlights the potential benefits of incorporating cooperative learning strategies into educational settings. Gillie (2023) reported that students who participated in cooperative learning strategies consistently outperformed their counterparts who only received traditional teacher-led discussions.

A second recommendation is to implement the same study to a broader sample size. Increasing the sample size would increase the chance of finding a significant difference in means between the pretest and posttest and be more comparable to the entire

population (Wyman & Watson, 2020). Increasing the sample size will enhance the statistical power of the study and may detect a statistical significance between the pretest and posttest measurements (Hecht, 2021). A larger sample size may also improve the generalizability of the findings to a broader population (Hecht, 2021).

References

2022 Educause Horizon Report: Teaching and learning edition. EDUCAUSE. (2022, April 18). Retrieved March 8, 2023, from https://library.educause.edu/resources/2022/4/2022-educause-horizon-report-teaching-and-learning-edition

Abdullah, M. I., Inayati, D., & Karyawati, N. N. (2022). Nearpod use as a learning platform to improve student learning motivation in an elementary school. *Journal of Education and Learning (EduLearn), 16*(1), 121-129. https://doi.org/10.11591/edulearn.v16i1.20421

Abuhassna, H., & Alnawajha, S. (2023). The transactional distance theory and distance learning contexts: Theory integration, research gaps, and future agenda. *Education Sciences, 13*(2), 112. https://doi.org/10.3390/educsci13020112

Achuthan, K., Kolil, V. K., Muthupalani, S., & Raman, R. (2024). Transactional distance theory in distance learning: Past, current, and future research trends. *Contemporary Educational Technology, 16*(1), 1-28. https://doi.org/10.30935/cedtech/14131

Alrajeh, T. S., & Shindel, B. W. (2020). Student engagement and math teaches support. *Journal of Mathematics Education, 11*(2), 167-180. https://ezproxylocal.library.nova.edu/login?url=https://www.proquest.com/scholarly-journals/student-engagement-math-teachers-support/docview/2459013943/se-2

American Institutes for Research. (2023). *Engagement monitoring and support tools: Student engagement surveys.* Communities in Schools. https://app.box.com/s/jqydevi2cl2rfinxysyu5zaer9fmb0wh

Andrew, L., Wallace, R., & Sambell, R. (2021). A peer-observation initiative to enhance student engagement in the synchronous virtual classroom: A case study of a COVID-19 mandated move to online learning. *Journal of University Teaching & Learning Practice, 18*(4), 1-21. https://ro.uow.edu.au/jutlp/vol18/iss4/14/

Anggoro, K. J., & Khasanah, U. (2022). Nearpod slides to enhance students' self-study. *SiSAL Journal, 13*(4), 442-446. https://doi.org.ezproxylocal.library.nova.edu/10.37237/130405

ATLAS.ti Scientific Software Development GmbH. (2023). ATLAS.ti Mac (version 23.2.1) [Qualitative data analysis software]. https://atlasti.com

Banas, E. J., & Emory, W. F. (1998). History and issues of distance learning. *Public Administration Quarterly, 22*(3), 365-383. https://ezproxylocal.library.nova.edu/login?url=https://www.proquest.com/scholarly-journals/history-issues-distance-learning/docview/1294875595/se-2

Beeman, K. L. (2022). The quiet girl in a virtual world: Learning from the virtual classroom to better support quiet girls in the middle grades. *Research in Middle Level Education Online, 45*(7), 1-19. https://doi.org/10.1080/19404476.2022.2106082

Berry, S. (2019). Teaching to connect: Community-building strategies for the virtual classroom. *Online Teaching, 23*(1), 164-183. https://doi.og/10.24059/olj.v23i1.1425

Bollinger, D. U., & Martin, F. (2020). Factors underlying the perceived importance of online student engagement strategies. *Journal of Applied Research in Higher Education, 13*(2), 404-419. https://doi.org/10.1108/JARHE-02-2020-0045

Botez, S. (2019). Correlation between the managerial style and communication style in education units. *Euromentor, 10*(1), 145-156.

Bouck, E. C., Long, H., & Jakubow, L. (2022). Teaching struggling students mathematics online via explicit instruction. *Preventing school failure: Alternative education for children and youth, 66*(2), 126-135. https://doi.org/10.1080/1045988X.2021.1980852

Buckley, H., & Nimmon, L. (2021). Social connectedness in virtual learning contexts. *The Clinical Teacher, 18*(3), 208-209. https://doi.org/10.1111/tct.13281

Castro, E., & George, J. (2021). The impact of COVID-19 on student perceptions of education and engagement. *e-Journal of Business Education & Scholarship of Teaching, 15*(1), 28-39.

Cevikbas, M., & Kaiser, G. (2022). Student engagement in a flipped secondary mathematics classroom. *International Journal of Science and Mathematics Education, 20*(1), 1455-1480. https://doi.org/10.1007/s10763-021-10213-x

Chadha, A. (2018). Virtual classrooms: Analyzing student and instructor collaborative experiences. *Journal of the Scholarship of Teaching and Learning, 18*(3), 55-71. https://doi.org/10.14434/josotl.v18i3.22318

Choi, J., & Walters, A. (2018). Exploring the impact of small-group synchronous discourse sessions in online math learning. *Online Learning, 22*(4), 47-64. https://doi.org/10.24059/olj.v22i4.1511

Cicco, G. (2017). Establishing positive culture and climate in the online classroom: Pathways for instructors. *Journal of Educational Technology, 14*(2), 1-5. https://ezproxylocal.library.nova.edu/login?url=https://www.proquest.com/scholar

ly-journals/establishing-positive-culture-climate-online/docview/2488220583/se-2?accountid=6579

Cloud Recording in Zoom Rooms. (2023). Zoom Support. Retrieved October 20, 2023 from https://support.zoom.us/hc/en-us/articles/206185446-Cloud-Recording-in-Zoom-Rooms#:~:text=Cloud%20recording%20in%20Zoom%20Rooms%20allows%20you%20to%20record%20meeting,can%20be%20viewed%20or%20downloaded

Conner, J. (2022). Who's afraid of student voice: The challenges of learning to listen to and learn from student feedback. *Teacher Education Quarterly, 49*(4), 49-71.

Cotrim, H., Granja, C., Carvalho, A. S., Cotrim, C., & Martins, R. (2021). Children's understanding of informed assents in research studies. *Healthcare, 9*(7), 1-16. https://doi.org/10.3390/healthcare9070871

Creswell, J. W., & Guetterman, T. C. (2019). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* Pearson.

Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting mixed methods research* (3rd ed). Sage.

Dennen, V. P., Yalcin, Y., & Hur, J. (2022). Student webcam behaviors and beliefs: Emergent norms, student performance, and cultural difference. *Online Learning, 26*(4), 168-192. https://doi.org/10.24059/olj.v26i4.3472

Diaz, A., Deran, J .J., Cruz, J., Ricohermoso, C., Casamayor, J., Rayman, M. E., Peromingan, R., Antonio, A., Pasoc, M. G., Antes, N., Tubo, M., Abequibel, B., Dioso, M., Morgia, J., Helar, M., Toribio, C., Francisco, J. M., Diaz, M. A., & Juanito, J. (2022). The blind and mute in virtual classrooms: Parental perceptions

towards online learning of children with special needs. *Special Education, 2*(43), 1538-1552.

Easley, K., & Lehto, J. (2022). Let's work together: Teacher strategies for supporting student engagement in long-term collaborative inquiry. *Science & Children, 60*(1), 80-83.

Edmonds, W. A., & Kennedy, T. D. (2017). *An applied guide to research designs: Quantitative, qualitative, and mixed methods* (2nd ed). Thousand Oaks, CA: Sage.

Fabian, K., Smith, S., Taylor-Smith, E., & Meharg, D. (2022). Identifying factors influencing study skills engagement and participation for online learners in higher education during COVID-19. *British Journal of Educational Technology, 53*(6), 1915-1936. https://doi.org/10.1111/bjet.13221

Gaad, A. L. (2022). The effects of online collaborative learning (OCL) on student achievement and engagement. *IAFOR Journal of Education, 10*(3), 31-49. https://doi.org/10.22492/ije.10.3.02

Gamage, K. A. A., Gamage, A., & Dehideniya, S. C. P. (2022). Online and hybrid teaching and learning: Enhance effective student engagement and experience. *Education Sciences, 12(*651), 1-13. https://doi.org/10.3390/educsci12100651

Garris, B. R., Novotny, B. A., & Kwangman, K. (2022). Lights, camera, action: A focus group study exploring university students' experiences of learning via zoom. *Journal of Educators Online, 19*(1), 81-93. https://search-ebscohost-com.ezproxylocal.library.nova.edu/login.aspx?direct=true&db=eue&AN=155151679&site=ehost-live

Gillies, R. M. (2023). Using cooperative learning to enhance students' learning and

engagement during inquiry-based science. *Education Sciences, 13*(12), 1-12. https://doi.org/10.3390/educsci13121242

Goodman, S. G., & Moore, E. (2023). To chat or not to chat: Text-based interruptions from peers improve learning confidence in an online lecture environment. *Journal of the Scholarship of Teaching & Learning, 23*(2), 29-56. https://doi.org/10.14434/josotl.v23i2.33413

Graus, G., & Enrique, M. (2023). Sample size calculation in scientific research. *Dilemas Contemporáneos: Educación, Política y Valores, 11*(1), 1-27. https://searchebscohost-com.ezproxylocal.library.nova.edu/login.aspx?direct=true&db=eue&AN=174567292&site=ehost-live

Händel, M., Bedenlier, S., Kopp, B., Gläser-Zikuda, M., Kammerl, R., & Ziegler, A. (2022) The webcam and student engagement in synchronous online learning: Visually or verbally? *Education and information technologies, 27*(7), 10405 10428. https://doi.org/10.1007/s10639-022-11050-3

Hatch, B. (2021). A new paradigm for early childhood education: Opening doors through virtual kindergarten. *Childhood Education, 97*(2), 60-63. https://doi.org/10.1080/00094056.2021.19007684

Havik, T., & Westergård, E. (2020). Do teachers matter? Students' perceptions of classroom interactions and student engagement. *Scandinavian Journal of Educational Design, 64*(4), 488-507. https://doi.org/10.1080/00313831.2019.1577754

Hecht, S. (2021, June 9). *Recorded chat for assignment #4 t-tests Tutorial with*

SPSS [Video recording]. https://nsu.instructure.com/courses/2528600/pages/recorded-chat-for-assignment-number-4-t-tests-tutorial-with-spss?module_item_id=44966153

Henrikson, R., & Baliram, N. (2023). Examining voice and choice in online learning. *International Journal of Educational Technology in Higher Education, 20*(1), 1-19. https://doi.org/10.1186/s41239-023-00401-w

IBM. (2023). *IBM SPSS Statistics.* https://www.ibm.com/products/spss-statistics

Johnson, D. W., & Johnson, R. (2016). Cooperative learning and teaching citizenship in democracies. *International Journal of Educational Research, 76*, 162-177. http://dx.doi.org/10.1016/j.ijer.2015.11.00

Kahne, J., Boywer, B., Marshall, J., & Hodgin, E. (2022). Is responsiveness to student voice related to academic outcomes? Strengthening the rationale for student voice in school reform. *American Journal of Education, 128*(3), 389–415. https://doi.org/10.1086/719121

Kara, M. (2021). Transactional distance and learner outcomes in an online EFL context. *Open Learning: The Journal of Open, Distance and E-Learning*, *36*(1), 45-60. https://doi.org/10.1080/02680513.2020.1717454

Kavrayici, C. (2021). The relationship between classroom management and sense of classroom community in graduate virtual classrooms. *Turkish Online Journal of Distance Education, 22*(7), 112-125. https://doi.org/10.17718/tojde.906816

Kennedy, H. (2018). How adults change from facilitating youth participatory action research. *Children and Youth Services Review, 94*, 298–305. https://doi.org/10.1016/j.childyouth.2018.10.010

Keyes, T. S., & Heath, R. D. (2023). The association between teaching practices and students' perceptions of being in a classroom community of engaged learners. *School Community Journal, 33*(1), 251-278. http://www.schoolcommunitynetwork.org/SCJ.aspx

Khong, T. D. H., Saito, E., & Gillies, R. M. (2019). Key issues in productive classroom talk and interventions. *Educational Review, 71*(3), 334-349. https://doi.org/10.1080/00131911.2017.1410105

Kost, R. G., & Rosa, J. C. (2018). Impact of survey length and compensation on validity, reliability, and sample characteristics for ultrashort-, short-, and long-research participant perception surveys. *Journal of Clinical and Translational Science, 2*(1), 31-37. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6208327/pdf/S2059866118000183a.pdf

Kuskis, O. A. (2006). *Facilitation and community in asynchronous online courses: Views and practices of expert practitioners* (Unpublished doctoral dissertation). University of Toronto, Ontario, Canada.

Long, H. M., Bouck, E. C., & Jakubow, L. N. (2021). Explicit instruction in mathematics: Considerations for virtual learning. *Journal of Special Education Technology, 36*(2), 67-76. https://doi.org/10.1177/0162643421994099

Lowenthal, P.R. & Moore, R. L. (2020). Exploring student perception of Flipgrid in online courses. *Online Learning, 24*(4), 28-41. https://doi.org/10.24059/olj.v24i4.2335

Luo, N., Li, H., Zhao, L., Wu, Z., & Zhang, J. (2022). Promoting student engagement in

online learning through harmonious classroom environment. *Asia-Pacific Education Researcher (Springer Science & Business Media B.V.), 31*(5), 541-551. https://doi.org/10.1007/s40299-021-00606-5

Martin, J. (2019). Building relationships and increasing engagement in the virtual classroom: Practical tools for the online instructor. *Journal of Educators Online, 16*(1), 1-8. https://doi.org/10.9743/jeo.2019.16.1.9

McKenna, K., Altringer, L., Gebhardt, K., & Long, M. G. (2022). Promoting meaningful interaction and community development through discussion board activities in the online classroom. *Journal of Educators Online, 19*(1), 94-112. https://doi.org/10.9743/jeo.2022.19.1.15

Měkota, T., & Marada, M. (2020). The influence of the Nearpod application on learning social geography in a grammar school in Czecha. *Education and Information Technologies, 25*(6), 5167-5184. https://doi.org/10.1007/s10639-020-10214-3

Meyer, K. A., & McNeal, L. (2011). How online faculty improve student learning productivity. *Journal of Asynchronous Learning Networks, 15*(3), 37–53. http://files.eric.ed.gov/fulltext/EJ935583.pdf

Mitra, D. L. (2018). Student voice in secondary schools: The possibility for deeper change. *Journal of Educational Administration, 56*(5), 473–487. https://doi.org/10.1108/ JEA-01-2018-0007

Moore, M. G. (Ed.). (2007). The theory of transactional distance. In *Handbook of distance education* (pp. 89-105). Mahwah, NJ: Erlbaum.

Morton, B. M. (2022). Trauma-informed school practices: Creating positive classroom culture. *Middle School Journal, 53*(4), 20-27.

https://doi.org/10.1080/00940771.2022.2096817

Muassomah, M., Halimi, H., Abdullah, I., & Ismail, I. (2023). Coping with technology: Children's experience with learning from home during the COVID-19 pandemic. *Asia-Pacific Journal of Research in Early Childhood Education, 17*(2), 67-88. http://dx.doi.org/10.17206/apjrece.2023.17.2.67

Muir, T., Wang, I., Trimble, A., Masinbridge, C., & Douglas, T. (2022). Using interactive online pedagogical approaches to promote student engagement. *Education Sciences, 12*(415), 1-19. https://doi.org/10.3390/educsci12060415

Nash, B. L., Zengilowski, A., & Schallert, D. W. (2023). "The conversation has more levels": Exploring Zoom's text chat as a discussion mediator in middle school teachers' online professional development. *Journal of Digital Learning in Teacher Education, 39*(2), 114-128. https://doi.org/10.1080/21532974.2023.2180117

Nearpod. (n.d.). *Nearpod interactive slides.* Nearpod: A Renaissance Company. https://nearpod.com/interactive-slides

Nyborg, G., Mjelve, L. H., Edwards, A., & Crozier, W. R. (2020). Teachers' strategies for enhancing shy children's engagement in oral activities: Necessary but insufficient? *International Journal of Inclusive Education, 26*(7), 643-658. https://doi.org/10.1080/13603116.2020.1711538

Oliveras-Ortiz, Y., Bouillion, D. E., & Asbury, L. (2021). Learning spaces matter: Student engagement in new learning environments. *Journal of Education, 201*(3), 174-182. https://doi.org/10.1177/0022057420908062

Ong, S. G. T., & Quek, G. C. L. (2023). Enhancing teacher-student interactions and

student online engagement in an online learning environment. *Learning Environments Research, 26*(3), 681-707. https://doi.org/10.1007/s10984-022-09447-5

Ozkara, B. O., & Cakir, H. (2018). Participation in online courses from the students' perspective. *Interactive Learning Environments, 26*(7), 924-942. https://doi.org/10.1080/10494820.2017.1421562

Pedler, M., Yeigh, T., & Hudson, S. (2020). The teachers' role in student engagement: A review. *Australian Journal of Teacher Education, 45*(3), 48-62. http://dx.doi.org/10.14221/ajte.2020v45n3.4

Piedra, D., & Yudintseva, A. (2020). Teaching in the virtual classroom: Strategies for success. *Journal of Applied business and economics, 22*(11), 192-196. https://doi.org/10.33423/jhetp.v20i12.3790

Premo, J., Cavagnetto, A., Collins, L., Davis, W. B., & Offerdahl, E. (2023). Discourse remixed: Shifting science learning through talk. *The Journal of Experimental Education, 91*(2), 336-357. https://doi.org/10.1080/00220973.2021.1993771

Qi Li, Q. J., Liang, J., & Wei Zhao, X. P. (2022). The influence of teaching motivations on student engagement in an online learning environment in China. *Australasian Journal of Educational Technology, 38*(6), 1-21. https://doi.org/10.14742/ajet.7280

Quiamco, M. S., Abodcado, S. M., & Toquero, C. M. (2022). Zoom engagement of pre service teachers during emergency remote classes. *Asian Journal of Distance Education, 17*(2), 19-46. https://doi.org/10.5281/zenodo.7051923

Ramli, M., Cahyadi, A., Mizani, H., Hendryadi, & Mais, R. G. (2024). Loneliness,

academic self-efficacy, and student engagement in the online learning environment: The role of humor in learning. *Research & Practice in Technology Enhanced Learning, 19*, 1-23. https://doi.org/10.58459/rptel.2024.19002

Reyes, J. A. (2013). Transactional distance theory. *Distance Learning, 10*(3), 43-50.

Roach, V. A., & Attardi, S. M. (2022). Twelve tips for applying Moore's theory of transactional distance to optimize online teaching. *Medical Teacher, 44*(8), 859-865. https://doi.org/10.1080/0142159X.2021.1913279

Rojabi, A. R., Setiawan, S., Munir, A., Purwati, O., & Widyastuti. (2022). The camera-on or camera-off, is it a dilemma? Sparking engagement, motivation, and autonomy through Microsoft teams videoconferencing. *International Journal of Emerging Technologies in Learning, 17*(11), 174-189. https://doi.org/10.3991/ijet.v17i11.29061

Samawi, F. S., & Al-kreimeen, R. A. (2022). Shifting to remote learning: Students' engagement and anticipating challenges: A review article. *Journal of Educators Online, 19*(2), 1-8.

Sedova, K., & Navratilova, J. (2020). Silent students and the patterns of their participation in classroom talk. *Journal of the Learning Sciences, 29*(4-5), 681-716. https://doi.org/10.1080/10508406.2020.1794878

Shana, Z., Lahiani, H., & Mahmoud, S. (2020). The effects of Kagan structures on UAE sixth grade students' performance of reading comprehension: A pilot study. *Education 3-13, 48*(8), 988-999. https://doi.org/10.1080/03004279.2019.1687555

Silva, H., Lopez, J., Dominguez, C., & Morais, E. (2022). Think-pair-share and

roundtable: Two cooperative learning structures to enhance critical thinking skills of 4th graders. *International Electronic Journal of Elementary Education, 15*(1), 11-21. https://doi.org/10.26822/iejee.2022.274

Spiker, A. (2021). Student engagement; Who is in charge? *College Teaching*, *69*(4), 183-190. https://doi.org/10.1080/87567555.2020.1846486

SurveyMonkey and GDPR. (2018). How it works. Retrieved from https://www.surveymonkey.com/mp/gdpr/

Tammi, T., & Rajala, A. (2018). Deliberative communication in elementary classroom meetings: Ground rules, pupils' concerns, and democratic participation. *Scandinavian Journal of Educational Research, 62*(4), 617-630. https://doi.org/10.1080/00313831.2016.1261042

Tarhini, A., Masa'deh, R., Al-Busaidi, K. A., Mohammed, A. B., & Maqableh, M. (2017). Factors influencing students' adoption of e-learning: a structural equation modeling approach. *Journal of International Education in Business, 10*(2). 164-182. https://doi.org/10.1108/JIEB-09-2016-0032

Vail, M., & Leary, K. (2022). Reengaging students: Students' engagement in school following case management services from communities in schools amidst the COVID-19 pandemic. *Communities in Schools*, 1-10. https://www.communitiesinschools.org/media/filer_public/77/cf/77cf5362-4ff6-4b34-952e-0af52072ad2b/2021-2022_engagement_survey_brief_final.pdf

Wenham, L. (2019). 'It's horrible. And the class is too silent' – A silent classroom environment can lead to a paralyzing fear of being put on the spot, called-out, shown up, shamed or humiliated. *Journal for Critical Education Policy Studies*

(JCEPS), 17(1), 162-187. https://search-ebscohost-com.ezproxylocal.library.nova.edu/login.aspx?direct=true&db=eue&AN=136972898&site=ehost-live

Werang, B. R., & Leba, S. M. R. (2022). Factors affecting student engagement in online4 teaching and learning: A qualitative case study. *The Qualitative Report, 27*(2), 555-577. https://doi.org/10.46743/2160-3715/2022.5165

Wylie, M. (2023). Experiences in an online learning community: The student perspective. *Quarterly Review of Distance Education, 24*(1), 15-23. https://search-ebscohost-com.ezproxylocal.library.nova.edu/login.aspx?direct=true&db=eue&AN=172036945&site=ehost-live

Wyman, P. J. & Watson, S. B. (2020). Academic achievement with cooperative learning using homogeneous and heterogeneous groups. *School Science & Mathematics, 120*(6), 356-363. https://doi.org/10.1111/ssm.12427

Xiangming, L., Zhang, X., Zeng, X., & Zhang, J. (2022). Exploring online student engagement scaffolded by teacher management communication style. *International Journal of Emerging Technologies in Learning, 17*(5), 4-15. https://doi.org/10.3991/ijet.v17i15.31513

Yong, K. W., Zaid, N. M., Wahid, N. H. A., Ashari, Z. M., Suhairom, N., & Said, M. N. H. M. (2021). Challenges in emergency remote teaching among Malaysian public elementary school teachers. *Internal Journal of Emerging Technologies in Learning, 16*(24), 74-90. https://doi.org/10.3991/ijet.v16i24.27453

Zoom, (n.d.). *One platform to connect.* https://zoom.us/

Appendix A

Participant Invitation

Dear _____,

My name is Kelly Clarke, and I am a doctoral candidate in the Educational Leadership program at Nova Southeastern University. I am conducting a mixed methods study to understand student engagement in a full-time elementary virtual classroom. The study will focus on your child's perception of student engagement and whether cooperative learning strategies increase student engagement in the virtual classroom. Your child's participation in this study will be appreciated. Please note, your child may withdraw from the study at any time.

This email aims to gather a cohort of students interested in participating in the study. Students who meet the following criteria may participate in the study.

- Enrolled in Mrs. Clarke's third grade class.

If your child meets the above criteria, your child may join the study. The study consists of a pretest and posttest survey, along with an optional 20-minute interview through Zoom. You and your child's privacy are important to the study, and your identities will remain anonymous. There are no known risks to your child's participation in this study. The benefit of your child's participation in the study is to determine best practices to enhance student engagement within the full-time virtual classroom. If you grant your child permission to participate in this study, please respond to this e-mail, as well as if you grant your child permission to attend the interview. If you do not wish your child to participate in the study, no further action is needed. If you have any questions, please let me know. Thank you.

Kelly Clarke

Appendix B

Engagement Student Survey: Engagement During Class Time

Elementary Student PreTest and PostTest Survey: Engagement During Class Time

The purpose of this survey is to better understand your engagement during live class time with your teacher, Mrs. Clarke. The questions range from strongly disagree to strongly agree. The survey should take no longer than 15 minutes. Please answer each question to the best of your ability. The responses to this survey will remain anonymous.

How strongly do you agree or disagree with the following statements? Mark one response only.

1. I feel like I am part of my school.
    - Strongly disagree
    - Disagree
    - Agree
    - Strongly agree
2. I feel that I am a valued member of my classroom community.
    - Strongly disagree
    - Disagree
    - Agree
    - Strongly agree
3. I am comfortable asking Mrs. Clarke for help when I need it.
    - Strongly disagree
    - Disagree
    - Agree
    - Strongly agree
4. I have friends within my classroom that I can talk to.

- Strongly disagree
- Disagree
- Agree
- Strongly agree

5. During class time, I participate regularly by turning on my Zoom camera.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
6. During class time, I regularly participate with the presentation tool, Nearpod.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
7. When I can, I participate during class time by talking with my peers to solve questions.
   - Strongly disagree
   - Disagree
   - Agree
   - Strongly agree
8. Mrs. Clarke provides time for me to collaborate with my peers to solve problems.
   - Strongly disagree
   - Disagree

- Agree
- Strongly agree

9. The use of cooperative learning strategies has helped me solve complex problems with my peers.
    - Strongly disagree
    - Disagree
    - Agree
    - Strongly agree
10. I feel good about attending live class time.
    - Strongly disagree
    - Disagree
    - Agree
    - Strongly agree

Appendix C

Virtual Student Engagement Interview

Virtual Student Engagement Interview

Interview Script

Hi! Thank you for participating in this Zoom interview with me, _____. Your parents or guardians provided consent to participate in this interview. I am a doctoral student at Nova Southeastern University. Your participation in this interview is valuable to understanding the connection between your feelings about engagement and your experience with cooperative engagement strategies within the last 6 weeks during our live class-time. Also, this interview might ask questions about your experience in a brick-and-mortar school, if you attended, and how your feelings of engagement in our virtual classroom compared to your past experiences.

The interview will take approximately 20 minutes to complete.

By agreeing to participate in this virtual interview, you give your consent for me to record the interview with your understanding that your information will remain anonymous. Verbatim responses will be used to determine patterns and themes, but your identity will not be compromised.

Do you have any questions before we begin, _____?

Note to interviewer: Answer any questions prior to beginning the interview. Ensure you have received the signed consent form from the participant's legal parent or guardian.

Interview Questions

1. How many years have you been attending this school?
2. Did you attend a brick-and-mortar school prior to attending this school? ***(If the student answered yes, ensure they answer questions 11-13).***
3. How do you define engagement during live class time?
4. How would you define cooperative engagement strategies?
5. What did you like or not like about cooperative engagement strategies that were used during live class time?
6. Do you like working with your peers in smaller groups? Why or Why Not?
7. Do you think working with your peers allowed you to understand the content taught by Mrs. Clarke better? Why or why not?

8. Do you think the use of your Zoom camera allows you to be more engaged during live lessons? Why or why not?
9. Does the use of cooperative learning strategies increase your engagement during live class time? Explain how if it does, or what would need to happen to increase your engagement.
10. Do you feel like you participate in Nearpod more if you feel more engaged? Why or why not?

    If students attended a brick-and-mortar class prior to attending this school, please ask the following three questions:

11. What was your experience with engagement like in the brick-and-mortar classroom?
12. How do your feelings with engagement in this virtual classroom compare to your feelings of engagement classroom in a regular school setting (brick-and-mortar)?
13. In your previous brick-and-mortar classroom, did your teacher use the same cooperative learning strategies as Mrs. Clarke? If so, how were they similar or different?

Script: We have reached the end of this interview. Do you have any questions or concerns that you would like expressed regarding this study before I stop recording? If not, I will stop recording at this time. Thank you so much for participating in this interview.