

Empowering educators to enhance engagement in a virtual learning environment

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Abstract

This qualitative modified e-Delphi study sought to obtain consensus from a panel of K-12 online education experts as to the most effective virtual strategies for student engagement in an online learning environment. Data was obtained through multiple questionnaires of 15 online education experts in northern California with three or more years of experience teaching virtually in a virtual learning academy. By rating engagement strategies, consensus on the most effective strategies for online engagement was obtained. The three rounds of questioning provided response to the question: What are the most effective engagement strategies for online learning? Based on the engagement strategies that received a consensus level of 70% or greater, screen sharing, discussion, lecture, and using an engaging curriculum were found to be extremely important. Participants also found teacher modeling, clear instructions, and discussing test taking to be very important engagement strategies. The engagement strategies that emerged were discussed in three themes, which included Delivery Practices, Engagement and Interaction, and Support and Accessibility. The results of this study may empower teachers when teaching virtually to enhance student motivation and help reduce students' feelings of isolation.

Key words: *Virtual Learning; Engagement Strategies; e-Delphi; K-12 Teaching; K-12 Students.*

Introduction

Engagement is a crucial component of learning. Engagement is of paramount importance when it comes to learning in an educational setting (Alvarez-Bell et al., 2017). It has been argued that engagement is the foundation for all learning, in that little can be learned if one is not actively engaged (Meyer, 2014). Unfortunately, at the time of the COVID-19 pandemic, very few educators knew how to teach virtually and maintain student engagement in an online environment (Eadens et al., 2022). Marzano (2009) identified strategies which had the potential to increase student performance and impact learning. Marzano's engagement strategies are for a regular on-ground classroom environment. Few studies have been done to identify the most impactful engagement strategies in an online environment. This study identified effective engagement strategies used by K-12 educators when teaching in an online environment.

1. Literature on students' classroom engagement

Effective engagement is important in the learning process. Engagement is an invaluable component of learning (Martin & Bollinger, 2018), and is considered a critical, moldable, student-centered educational component which is susceptible to environmental influence and has a strong impact on student success (Fredricks et al., 2014). Teaching and learning have changed substantially since the turn of the century, and it has largely been attributable to the development of modern technology (Gul & Rafique, 2017). However, simply being optimistic about technology and innovation is not the way to

guarantee quality in a virtual learning education (Hansson, 2021). Although students may have a plethora of digital experience outside school, many may lack its application educationally. As a result, educators in every learning environment should constantly attempt to grow their teaching strategies to fit ever-changing student needs and attitudes about learning (Gul & Rafique, 2017). The answer to affecting this positive change and increasing student learning outcomes is effective teaching practices and pedagogical practices (Tomaszewski et al., 2022). Implementing contemporary teaching strategies which embrace different intellectual abilities will directly influence student learning and are more impactful than orthodox teaching strategies (Gul & Rafique, 2017).

In discussing the transition to online learning during the COVID-19 pandemic, Hansson (2021) asserted that the organization, teaching, and technical aspects of online learning were not well planned prior to COVID-19. The biggest obstacle was not internet connectivity issues, internet access, or even technological shortcomings, but rather inefficient teaching strategies and methods. Gul and Rafique (2017) discussed the need for updated pedagogical practices, saying, “Teachers equipped with modern teaching strategies plays a pivotal role in the ultimate progress of students’ academic and educational performance” (p. 197).

Teaching strategies reflect what educators value most educationally and to what degree learners understand what they are being taught (Gul & Rafique, 2017). According to Hansson (2021) certain teaching strategies are greatly effective in online learning environments. They include good communication, active participation, knowledge-rich classroom environments, learner-centered approaches to instruction, and active participation. Tomaszewski et al. (2022) also included that learning institutions should have a cohesive, aligned curriculum, which will positively influence student academic performance, attendance, and overall behavior in school. Tomaszewski et al. (2022) explained how impactful contemporary teaching practices can be on numerous learning outcomes like motivation, engagement, and overall success. However, ensuring that educators adopt and embrace teaching strategies that create change may require a complete philosophical shift in thinking (Hansson, 2021). Educators should be digitally competent, conscious of effective engagement strategies, and embrace the need to locate, analyze, and evaluate information critically. The deeper understanding of contemporary teaching strategies has a substantial impact on learning because the relationships between students and teachers, along with their interactions, can positively influence learning and educational outcomes (Tomaszewski et al., 2022).

Rani et al. (2022) discussed the importance of the teacher knowing the different learning styles of students and a willingness to adjust the style of teaching accordingly. Knowing how students learn best is the first step of productive, results-driven teachers (Rani et al., 2022). Teaching strategies can refer to a multitude of concepts and strategies. Rani et al. (2022) described teaching strategies as any group of plans, routines, or steps that a teacher uses to help aid in the usage, collection, storage, or retrieval of information for the synthesis of learning. Teaching strategies are concrete, pre-conceived steps taken by the teacher to aid in learning new material in a faster, easier, effective, and transferable way. Teaching strategies can help motivate and engage students to become active learners (Xu, 2018). Xu (2018) claimed it is crucial that educators select functionally appropriate teaching strategies which encourage learning so that students will process information deeply, allowing them to assimilate new information. Rani et al. (2022) further postulated that the teacher needs to be aware of his or her own learning style preferences as well as those of the student, adjusting their own method of teaching in the process. Adjusting the instructional method is valuable and possible when educators are aware of the learners’ needs. Rani et al. (2022) went even further saying a teachers’ instructional style and the students’ learning style should match. When this happens, it stands to improve learning efficiency which will affect comprehension and the processing of new material. Xu (2018) asserted that a teacher’s choice of teaching strategies is a fundamental element of teaching, learning, and overall instructional design.

According to Tomaszewski et al. (2022) there is a strong correlation between student engagement and academic performance during the last twenty years. Luo et al. (2022) referred to student engagement as “the holy grail of online learning” (p. 541), and claimed that students participate more in learning, try harder, and show a greater interest, when actively engaged, which strongly increases individual achievement. Zayapragassarazan (2020) asserted that strong engagement strategies will motivate students to be involved in their education and encourage good habits and attitudes. Luo et al. (2022) defined student engagement as the combined physical and psychological aspects of students that cause them to want to invest themselves in their own education. This multifaceted construct includes three interwoven components of cognitive, affective, and behavioral engagement that students encounter while learning, which can directly influence behavior, attitude, and opinion (Luo et al., 2022; Tomaszewski et al., 2022). It is clearly established that students are attentive, excited, and willing to perform when actively engaged in learning (Luo et al., 2022). The cognitive aspect of engagement pertains to mental effort and thought, and affective engagement pertains to how students feel while learning. The behavioral engagement pertains to observable outcomes which take place during learning. Luo et al. (2022) emphasized the connectedness of the three dimensions of student engagement and how they are in no way separate from one another. Of utmost importance is the understanding of the connection in increasing student engagement, academic performance, attendance, emotional well-being, and long-term feelings about education in general.

K-12 teachers have a crucial role in student outcomes (Ekmekci & Serrano, 2022). Studies suggest school engagement during the elementary school years may play a substantial role in determining a learner’s future career choice than classroom engagement experienced during later years of schooling (Ekmekci & Serrano, 2022). The responsibility to

provide effective engagement strategies largely rests on teachers (Luo et al., 2022). Järvinen et al. (2022) took the idea of engagement one step further and determined that there are six different levels of engagement or disengagement, which can change from moment to moment during a student's academic day. These levels include high engagement, moderate engagement, indifferent engagement, anxious engagement, and bored disengagement (Järvinen et al., 2022).

COVID-19 caused a multitude of changes to education in an extremely short period of time. For millions of students and teachers the transition from face-to-face, in-person learning to distance learning happened from one day to the next and was not easy or smooth (Ilona Huszti et al., 2021 & Ira et al. 2024). Consequently, teachers were largely unprepared for the online platforms they were forced to use as their single means of teaching and maintaining student engagement (Merve & Çağanağa, 2022). Amidst worldwide uncertainty, global fear, and unprecedented disruption, educators were forced from the comfort and familiarity of their physical classrooms into the unknown, virtual world of learning. With little guidance and feelings of discomfort and uncertainty, teachers and students were forced to adapt to new technological changes and a new idea of distance learning (Powell & McGuigan, 2020). The problem is that most K-12 virtual learning instructors do not know which engagement strategies are most effective when teaching in an online environment (Eadens et al., 2022). Due to a lack of awareness of strategies to engage students in an online environment, pedagogical strategies can result in student disinterest, underachievement, and problems with attendance (Zayapragassarazan, 2020). In an online environment, student engagement is critical to learning. Stobaugh et al. (2020) wrote that engagement is crucial for students, and that the level of engagement has strong implications on success. By knowing which online engagement strategies are most effective in a distance learning environment, K-12 public education teachers will not only improve student learning, but will enhance student motivation, increase personal satisfaction, reduce feelings of isolation, and improve performance when learning virtually (Martin & Bolliger, 2018).

2. Theoretical Framework

Gagné (1985) postulated that learning should be made as easy as possible by the proper planning and sequence of specific educational activities. Gagné's (1985) Conditions of Learning theory holds that there are different levels of learning, each of which requires different types of instruction or pedagogy. Furthermore, Gagne asserted that the parts or events of an educational lesson could be planned and analyzed to optimize learning and further define instruction. Hamilton (1997) describes these events as being intentionally planned and thought out which promote student learning. Within the Conditions of Learning theory, Gagné indicates nine levels of learning which should be used in every learning situation, making the learning process effective. In specific order, those levels or events are (a) gaining a student's attention (b) identifying an objective to be learned (c) recalling prior knowledge (d) presenting a stimulus (e) guiding learning (f) eliciting a specific performance (g) providing feedback (h) assessing performance, and (i) enhancing the retention of knowledge and the transfer of the knowledge (Gagné, 1985). Applying Gagné's Conditions of Learning theory to the present study aided in understanding how virtual engagement strategies in K-12 public education environments affected student learning. The idea of a set of learning conditions is the foundation for determining instructional tasks and scaffolding instruction. This means that the success of the learning processes depends on the existence and order of specific components of the lesson.

3. The aim of the study

The purpose of this qualitative modified e-Delphi study was to obtain consensus from a panel of K-12 online education experts as to the most effective virtual strategies for student engagement in an online learning environment. To empower teachers with effective engagement strategies when teaching virtually. The research question postulated is: What is the consensus of K-12 online education experts' most effective strategies for student engagement in a virtual learning environment?

4. Method and result

This study utilized a Delphi method to achieve consensus on the most effective engagement strategies for online learning according to a panel of experts in the field of online learning. The Delphi method is a research technique which effectively organizes a group process of communication so that the process can grapple with a complex issue (Linstone & Turoff, 1975). The research maintained the anonymity of its research participants by exclusively allowing involvement through anonymous email communications and online questionnaires. The experts participants were volunteers from nearly 150,000 K-12 public education instructors in northern California. Research participants were recruited using three criteria for inclusion. Participants must have: (a) been fully K-12 credentialed (b) taught for a minimum of three years c) taught exclusively online for at least three years. After IRB approval, a purposive sample of twenty experts were invited to

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participate via email, telephone, or mail, who met the inclusion criteria. This number is in-line with Altinpulluk et al. (2020) who recommended a total of 10–18 experts for Delphi studies. The original recruitment letter produced 20 potential participants, however only 15 people returned the informed consent form.

The process for collecting data included three rounds of electronic questionnaires. The questionnaire using SurveyMonkey® from round one contained sixteen questions, six demographic questions and ten open-ended questions created to identify best practices for engaging students online. The participants had five days to complete the questionnaire. For each round of questioning, the data received from participant responses was analyzed with the goal of reaching 70% consensus among panel participants as the most effective engagement strategies for online learning. Hasson et al. (2000), explained that the idea of consensus does not mean that participants achieved 100% agreement, but rather a percentage of agreement between 55% to 100%, with 70% being the typical result. Round one asked the participants to identify engagement strategies through a series of open-ended questions. Both open and axial coding strategies were utilized to identify themes and sub-themes from the answers to round one questions. The online instructional strategies identified by study participants in round one was used to create the questionnaire for round two. The purpose was to understand the results of round one and commence rating each identified engagement strategy according to its importance. In round two, responses from round one that reached 70% consensus were put in a Likert scale, and participants further rated the importance of each engagement strategy. The third round of questioning was to allow participants to move toward consensus regarding the most effective engagement strategies for online learning from round two. Data analysis was an iterative process. The data gathered from the Likert-scale questionnaires was analyzed upon the completion of each round utilizing a five-step protocol (see Table 1). Consensus was reached by the third round, which is typical of most Delphi studies (Skulmoski et al., 2007). The answers from the final ten open-ended questions were analyzed. Table 2 shows the consensus reached for the engagement strategies. Participants believed three engagement strategies were extremely important: screen sharing, discussion and lecture, and using an engaging curriculum. Participants also found teacher modeling, clear instructions, and discussing test taking to be very important engagement strategies.

Table 1. Steps of data analysis

Step	Task
#1	Reviewed and became familiar with the data received.
#2	Categorized information according to similarities and differences in the data.
#3	Investigated any themes, patterns, or repetitions in the data.
#4	Analyzed & assessed responses according to numerical importance within the data.
#5	Created a new questionnaire based on the highest numerical values reported (unless consensus is achieved).

Table 2. Round three: K-12 educators virtual engagement strategies

Engagement Strategies	Consensus
Screen sharing	93.33%
Discussion and lecture	86.87%
Using an engaging curriculum	86.67%
Teacher modeling	80.00%
Clear instructions	80.00%
Discussing test taking	80.00%
Content connection – discussing family, friends, and relationships	78.57%
Personal Reflection- activities about students personal lives	78.57%
Notebooks, Mystery Science, Nearpod, Padlet, Quizlet, Puzzles, & Quizizz	74.58%
Gamification: Breakout EDU, Blooket, Prodigy, and Digital Escape Rooms	74.56%
Educational Videos	73.33%
Previewing and reviewing material	73.33%
Translation Tools	73.33%

Note. Strategies with at least 70% consensus

5. Discussion and recommendations

The three overarching themes that emerged from the data include Delivery Practices, Engagement and Interaction, and Support and Accessibility. Delivery Practices refers to the individual, pedagogical aspects of a teacher's instructional style and how they express or relay content to students. These practices include stylistic choices made by a teacher about what to focus on within the curriculum, how to deliver particular lessons, and to what level students will be exposed to test taking strategies or the reviewing of materials. Engagement and Interaction, on the other hand, pertains to teaching methods geared to initiate and maintain student interest and involvement with the teacher, students, and the lesson being taught. This includes the use of online games or gaming platforms (gamification) for learning, relational activities that involve student input about personal relationships with family and friends, along with tasks that call for self-reflection and discussion with the teacher or classmates. Lastly, Support and Accessibility has to do with specific pedagogical strategies necessary for online learning, along with strategies intended to remediate or clarify instruction for greater student understanding.

Theme 1: Delivery Practices

- Using an engaging curriculum
- Discussion and Lecture
- Clear Instruction
- Discuss test taking
- Previewing and reviewing materials
- Educational videos

Theme 2: Engagement and Interaction

- Online Tools: Interactive Notebooks, Mystery Science, Nearpod, Padlet, Quizlet, Puzzles, and Quizizz,
- Gamification: Breakout EDU, Blooket, Prodigy, and Digital Escape rooms.
- Content connection – discussing family, friends, and relationships.
- Personal Reflection- activities about students' personal lives.

Theme 3: Support and Accessibility

- Screen Sharing
- Teacher Modeling
- Translation tools

These overarching themes illustrate the need for solid teacher delivery practices even in an online environment, the growing potential for gamification activities when learning core content, and an overwhelming need for relational activities between students and between students and their teachers. The emerging themes are also reinforced by Gagné's Conditions of Learning theory in understanding the foundation for effective engagement strategies in K-12 public education environments. The interpersonal relationships were perhaps the biggest "take-away" in this study. It was easy to believe that strong teacher delivery practices are important, as well as the potential that gamification activities have in learning. What was surprising was the importance of interpersonal activities when it comes to online learning, which could be isolating. The data shows consensus for activities that encourage interpersonal relationships for online learning.

Research findings presented have substantial implications on student engagement strategies for educators in grades K-12. It is recommended that online educators actively investigate and implement the use of focused gaming strategies as part of their online curriculum frequently and with vigor. This recommendation is supported by research highlighting how using gamification strategies in the classroom is an innovative educational method that helps students solve problems, become more engaged, stay motivated, and promote their own learning in all academic areas and opportunities (Alsadoon, 2023; Dicheva et al., 2018; Garcia-Lopez et al., 2023; Liu et al., 2022). Using focused gaming strategies that provide competitive, interpersonal, and intrapersonal learning opportunities as part of an online curriculum will have strong implications on learning outcomes for students in grades K-12. Liverano (2024) studies also showed that using forms of technology strategies can conduit the skills gap that complicates writing activities.

It is recommended that online educators focus intently on lesson delivery techniques with proven results like sufficient teacher modeling, teacher lecturing and discussions, clear and detailed instructions, and using educational videos to help with instruction and motivation. Research supports this recommendation in that the effective implementation of these types of essential engagement strategies in online environments has a profound impact on a student's educational environment and overall learning experience (Lin et al., 2022; Lodge & Harrison, 2019; Martin & Bollinger 2018; Wilson, 2018). Establishing solid instructional techniques is an irrefutable necessity when establishing an engaging, functional learning environment in an online learning setting.

Lastly, it is recommended that online educators recognize the undeniable value of developing personal relationships in online education and provide frequent opportunities for interaction between students and between the teacher and student throughout their online program. Research supports the final recommendation regarding the need for establishing both interpersonal and intrapersonal relationships as a foundation for making online learning both valuable and effective (Ghergel et al., 2023; Gray & DiLoreto, 2018; Gurvitch & Gi-cheol Kim, 2023). Although students may lack the physical,

“face-to-face” relationships between their teachers and peers, online educators should still attempt to establish strong levels of interconnectedness through engagement practices which foster relationship building. Gurvitch and Gi-cheol Kim (2023) also noted that the relationship between the instructor and the learner in an online learning situation is essential. Although there is separation by a computer screen in a distance learning environment, both the teacher and the learner will succeed better when an authentic social connection is cultivated to foster feelings supporting a sense of belonging. Relationships, in other words, are no less important in online learning than they are in regular, brick-and-mortar classroom learning environments.

6. Conclusions

This research study provides a list of engagement strategies that can be utilized and integrated into most online K-12 curricula to better impact educational outcomes. There is no universal solution to student engagement, but this study aligns with similar studies about engagement. It is crucial that both online educators and online students are cognizant of the ways in which they are more engaged so that they can learn as much as possible in their classes. This study adds to understanding what engages students in an online environment. Further research is needed on how learners' environments affect virtual learning. Factors such as noise, technical issues, and internet connectivity may influence outcomes. Geographic location—urban versus rural—could also play a role. A pre-test/post-test design is proposed, with a treatment group receiving targeted engagement strategies and a control group following the standard online format. Leaders in the field of online education must prioritize strategies that engage students, address all appropriate content standards, and optimize learning, so that students maximize their potential school (Hansson, 2021; Luo et al., 2022; Rani & Anjaneyulu, 2022; Tomaszewski et al., 2022; Zayapragassarazan, 2020; Xu, 2018). With the increasing interest in virtual learning, this study is significant in empowering teachers to intentionally integrate engagement strategies to enhance online experience while strengthening student motivation.

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