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Tiffany L. Benaroya
Rutgers University - School of Health Professions

Jennifer C. George
Rutgers University - School of Health Professions

Deborah McKernan-Ace
Rutgers University - School of Health Professions

Margaret Swarbrick
Rutgers University Center of Alcohol and Substance Use Studies, Graduate School of Applied and Professional Psychology

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Abstract

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Keywords

Occupational therapy assistant, active learning strategies, online learning

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Application of Active Learning Strategies for Online Delivery in an Occupational Therapy Assistant Program

Tiffany L. Benaroya, OTD, OTR, Jennifer C. George, OTD, OTR, COTA,

Deborah McKernan-Ace, COTA, MOT/OTR, and Margaret Swarbrick, PhD, FAOTA

Rutgers University

United States

ABSTRACT

The COVID-19 pandemic had a significant impact worldwide in every aspect of society including occupational therapy assistant students enrolled in academic coursework. This manuscript examines the unique experience of occupational therapy assistant faculty in a northeast state who were able to quickly modify classroom and lab teaching-learning strategies to a fully online virtual format for two semesters. Since no available information on strategies for online delivery of occupational therapy assistant education were found in the literature, their experiences implementing active learning strategies are described and discussed. Strategies covered include: the flipped classroom model; think-pair-share and jigsaw technique using breakout rooms; polling and student response systems; muddiest point via chat box; lab kits; one-minute paper using discussion forums; and student-generated videos. Twenty students provided feedback through a survey about the helpfulness of each strategy. The breakout room and chat box feature of the synchronous virtual classroom as well as lab kits were perceived as most helpful, whereas student-generated videos and one-minute papers were perceived as least helpful. Implications for continued incorporation of online learning in occupational therapy assistant curricula are outlined.

Higher education across the United States and abroad was disrupted by the advent of the COVID-19 pandemic during the 2020 spring semester. Healthcare programs, which often require both direct skills practice and didactic lectures, were challenged as to how to adequately teach students in a fully virtual environment. As such, educators throughout the country rapidly searched for creative ways to actively engage students to build skills and competencies, while adhering to established academic requirements.

Though many healthcare programs have offered coursework online in many disciplines, the sudden and unanticipated need to adapt to the virtual classroom environment posed an especially unique challenge for educators who had limited experience with online teaching. Overnight, faculty were expected to modify traditional in-person didactic coursework offered in a physical classroom setting into a virtual teaching-learning classroom environment. There was an immediate need to craft active learning approaches that could be implemented virtually.

Online learning refers to courses where at least 80% of the content is delivered via the internet (Allen & Seaman, 2016). This is in contrast to distance learning, which is more inclusive and refers to any course of study where students and faculty are apart (Kentnor, 2015). Notably, there are no accredited entry-level occupational therapy (OT) or occupational therapy assistant (OTA) programs offered in the United States entirely in an online format due to fieldwork and varying in-person class requirements (American Occupational Therapy Association [AOTA], 2020a; AOTA, 2020b). Prior to 2020, there seemed to be a very slow trend to offer OT and OTA education in this format, with only fourteen schools predicted to offer more than 50% of their coursework online (AOTA, 2020a; AOTA, 2020b). However, after March 2020, a majority of programs were mandated by their institutions to close in-person classes, which challenged them to transform traditional classroom lecture, lab, and clinical education to online delivery. To date, we have not found any literature describing these experiences, but anecdotally learned many programs faced significant barriers or had to stop offering certain courses altogether.

Limited research exists looking at the impact of online learning in OT and OTA education. Studies that do exist are found in the OT literature, and have found similar course performance results between online and face-to-face students (Mu et al., 2014; Rogers et al., 2011). This is in line with other allied health science education research which has found little or no difference between the performance of distance and traditional students, even in skills based courses (Chipps, 2012; Hollis & Madill, 2006; Kaur et al., 2020). A meta-analysis by Williams (2006) even found distance students may perform slightly better than their traditional peers. Smith et al. (2009) remind us that while several features of online learning do overlap across professions, it is important to consider differences in each discipline when developing online instruction.

Active learning techniques are instructional methods that compel the student to become thoroughly engaged in the process of gaining knowledge (Bonwell & Eison, 1991; Gooblar, 2019). Active learning requires the students to take part in activities that involve higher-order thinking empowering the students to take responsibility for their own learning (Bonwell & Eison, 1991; Gooblar, 2019). Studies have previously demonstrated that active learning strategies support learning, can lead to better grade performance, and are often preferred to more traditional passive learning strategies (Bacon, 2019; Freeman et al., 2014; Ul Huda, 2016).

There has been limited research describing implementation of active learning strategies in an online format in OT and OTA education. In a survey of OT programs, many programs use online technology to access the program's learning management system,

student grades, lecture materials, homework collection, and online library research tools; clinical virtual simulations, online quizzes, and posting online lectures was found to be limited (Gee et al., 2017). The authors found that instructional tools in online environments are used in limited amounts or not at all (Gee et al., 2017). In general, distance education literature research has suggested that utilizing a variety of instructional methodologies and assessments support different learning styles may be beneficial (Gaytan & McEwen, 2007). Multiple studies highlight the need to promote student interactivity (Mahmood, 2020; Sharoff, 2019).

While it should not be presumed that active learning strategies utilized in a physical classroom environment will carry over to an online virtual learning environment, given the limited amount of research in this area in OT and OTA specific education, this was a starting point to identify potential strategies within an OTA program. This paper presents a variety of active learning approaches employed in an online forum to maximize student engagement during two semesters during the COVID-19 pandemic. The available research or information supporting these strategies and the perceived effectiveness reported by impacted students will be shared.

Description

The following section outlines the various active learning strategies nine OTA faculty implemented during the spring and summer 2020 semesters to support student learning (see Table 1). Strategies are divided by those utilized in a synchronous virtual classroom versus in a learning management system.

Table 1

OTA Faculty Strategies Utilized

Platform	Strategy	Definition/Example(s)
Synchronous Virtual Classroom	Flipped Classroom	Students are assigned lecture content to be completed prior to class to permit for more in-depth conversation and application of prepared material during class (O'Flaherty & Phillips, 2015; Roehl et al., 2013).
	Breakout Room	Allows for participants in the main room to be divided into smaller groups. E.g. Think-Pair-Share: Students are tasked to think of their response to a question, are then paired with a classmate to discuss, and then share their conclusions with the entire class (Lyman, 1981). E.g. Jigsaw Technique: Groups of students are given different parts of one topic to discuss. Students representing different parts of the topic are then grouped so that each part is represented and can be taught to their classmates (Woods, 2019).

	Polling and Student Response Systems	Polling and surveying students can be used for a variety of purposes including promoting interaction, assessing preparation, gauging opinion, and determining understanding of lecture material (Caldwell, 2007).
	Chat Box	A two-way text-based communication that allows students and faculty to send messages, ask or answer questions, conduct a poll, or allow a student who does not feel comfortable speaking the opportunity to communicate with other students and faculty. E.g. Muddiest Point: Students submit a short written response describing one concept they found to be least clear during class (Angelo & Cross, 1993).
	Lab Kits	Lab kits include relevant lab/coursework supplies students can use at the home during class and exams so they have hands on clinical skill practice opportunities.
Learning Management System	Discussion Forum	Asynchronous, electronic messaging board. E.g. One-Minute Paper: Students are provided one minute to write their answers to questions about the most important thing learned in the day's class and what may still be most confusing (Stead, 2005).
	Student-Generated Videos	Videos created by students typically to meet an aim or assignment for that course.

Nine courses were held during this time period with introductory courses offered for newly admitted students and more advanced courses on therapeutic interventions for mental health, pediatric, and adult populations for continuing students. Different faculty utilized different combinations of the strategies listed to teach their 30 students in courses that would otherwise be held in person. Many of the courses included would typically have had a laboratory component. Each strategy is defined in terms of how it was implemented as well as available research supporting its use.

Synchronous Virtual Classroom

Platforms such as Zoom, Webex, GoToMeeting, Google Hangout, and Adobe Connect were utilized to transition live classrooms to a virtual experience. Several of these platforms have embedded within them a variety of features to enhance the classroom experience such as: breakout rooms for small group discussions, chat boxes for live Q & A, polling and quizzing, as well as the option to share presentations and videos. Prior to the onset of the pandemic, the OTA students had minimal experience with the basic features of Zoom, the synchronous virtual classroom of choice at our university. During the spring and summer 2020 terms, these advanced Zoom features were utilized to engage students in the teaching-learning process.

Flipped Classroom

In a flipped classroom model, students are typically assigned lecture content to be completed at home prior to class (Roehl et al., 2013). In that way, time can be freed during class for more in depth conversation and application of prepared material (O'Flaherty & Phillips, 2015; Roehl et al., 2013). In a scoping review by O'Flaherty and Phillips (2015), they concluded that studies demonstrate student perceptions regarding this approach are generally positive. Additionally, they concluded that while several studies demonstrate an improvement in academic performance utilizing this model, more rigorous studies examining longer term impact on performance are needed. In utilizing a flipped classroom model with OT students, Henderson et al. (2020) found students accomplished their learning objectives and appeared to become more active learners.

The flipped classroom model was employed across a few OTA courses in different ways. As part of an introductory course to OT, the flipped classroom model was used to teach the history of OT. Students were broken into groups based upon time periods and were assigned two historical figures from that period to learn about. The groups were provided the instructor's PowerPoint which included embedded videos as a resource, and then students were asked to conduct their own research. Students summarized important details and were tasked with writing a letter to the editor of a newspaper as if they were the historical figure to describe what life was like and what was going on in the OT profession at that time. Groups shared their findings with their fellow classmates and fielded questions about their historical figure and time period.

In another example, the flipped classroom model was utilized in a mental health and wellness course. Almost weekly, students were assigned to post responses to case studies and textbook questions in a discussion forum as preparation for class when they would engage in further smaller group dialogue.

Breakout Rooms

Think-Pair-Share. Think-pair-share is a three-part activity which allows for student cooperative learning (Lyman, 1981). As a first step the teacher poses a question, typically open ended, to challenge critical thinking skills. Students are given time to individually *think* of their response at which point they are *paired* with another student to discuss. Lastly, partners *share* highlights from their discussion with the class at large.

Karge et al. (2011) highlighted this strategy as an effective way to actively engage adult students in the learning process. In a modified version of this approach utilized in an associate level nursing program, it was demonstrated to improve student engagement and proficiency assessment results (Fitzgerald, 2013). Additionally, Kaddoura (2013) highlighted this strategy as an effective way to build critical thinking in nursing students.

With the use of the breakout room feature, the think-pair-share approach was utilized as a method to boost student participation during online OTA coursework. For example, during a therapeutic occupations course, students were assigned to a specific dressing technique or strategy to learn and to consider what type of population it would be most beneficial for (*think*). Students were then partnered with another student and separated into their own breakout room to teach them about their assigned technique or strategy (*pair*). Thereafter, all the students were gathered together to discuss and problem solve relevant scenarios according to the dressing techniques and strategies just learned (*share*).

In another example, students were assigned to either an electronic health record group or telehealth group. Each group was given a problem to solve regarding their assigned topic (*think*), first on an individual basis. One student from each group was paired with someone from the opposite group to discuss their solutions (*pair*) via a breakout room. To end, students were divided back into their original group assignments to *share* their results, also via a breakout room.

Jigsaw Technique. The Jigsaw Technique (JT) is a collaborative learning method where the first step involves individuals being broken out into different groups to discuss only one part of any given topic (Woods, 2019). Groups are then reassigned to consist of one group member from each of the original groups so that each new group has a member to teach others about their topic (Woods, 2019); this is much like each piece of a jigsaw puzzle comes together to form a completed image.

Studies looking at the effectiveness of the JT have yielded mixed results across a wide array of subjects. For example, in a study by Goolsarran et al. (2020), medical residents assigned to learning via the JT versus a traditional group learning approach performed significantly better on a diagnostic reasoning skills post-test and were more satisfied than their peers. Additionally, a study by Buhr et al. (2014) found medical students utilizing the JT to learn about the roles of long-term and post-acute care professionals were satisfied with the methodology and demonstrated positive knowledge test results. In a study by Márquez et al. (2017), students were tasked with constructing concept maps about radioactivity, revealing no statistical differences seen between the control group and JT group, although the authors argued that those in the JT group required less effort to obtain equal results. In their study, Leyva-Moral and Riu Camps (2016) found nursing students did not feel they learned more with the JT as compared to other methods and their overall satisfaction was low.

In utilizing the JT, students were tasked with preparing content for class and subsequently utilized breakout rooms to discuss the material with their peers. For example, in a pediatric conditions course, students were assigned to review varying case studies covering different conditions. Initially, students were paired with peers who were assigned the same condition to discuss the case in more detail. Thereafter, students were “jigsawed” so that each breakout room consisted of students who prepared a different case study; in this way, they were better able to cover all content for the week and students were held responsible for their own learning.

Polling and Student Response Systems

The use of polling and student response systems (SRSs) can be easily integrated into an online learning format. Several platforms, such as Zoom, already have a polling option embedded, while other online programs, such as Poll Everywhere, Socrative, Quizzizz, and Kahoot!, can be run while hosting a virtual class as online student response systems are able to replace previous generation “clickers.” Caldwell (2007) reported on a host of potential uses of audience response systems such as promoting student interaction, assessing student preparation, gauging student opinion, and determining student understanding of lecture material, amongst others.

There is strong support for the use of polling and SRSs to promote student learning. Several studies have demonstrated that students across a variety of disciplines feel this technology supports more active classroom engagement (Abdulla 2018; Stover et al., 2015; Wang et al., 2019), improves attention (Stover et al., 2015; Sun, 2014), improves individual learning (Abdulla, 2018; Preszler et al., 2007; Shon & Smith, 2011; Stover et al., 2015; Wang & Tahir, 2020) and that it may positively impact students’ exam performance (Abdulla, 2018; Bartsch & Murphy, 2011; Preszler et al., 2007;). Student impressions tend to be positive (Preszler et al., 2007; Shon & Smith, 2011; Wang & Tahir, 2020) and support exists that anxiety may be lessened with use of this technology, likely related to the anonymity it affords (Wang & Tahir, 2020).

Polls and SRSs were dispersed throughout OTA coursework for quick check-ins for understanding assigned readings, formative assessments of lecture content, as well as for a fun, interactive way to break up the class. After review of the OT intervention process as per the *Occupational Therapy Practice Framework (4th ed.)*, students engaged in a SRS where they were required to answer multiple choice and true/false questions testing their understanding of relevant professional terminology. In its ability to provide immediate feedback, the professor was then able to identify areas that seem to be well understood and others that required additional review to adapt lecture content to meet students’ learning needs.

Chat Box

The use of text messaging or instant messaging has become part of everyday communication including within the educational environment. Two-way messaging has been shown to be an effective form of communication between students and instructors, highly recommended by both for its usefulness to communicate quickly and easily (Lauricella, 2013). While literature could not be located on the use of a “chat box” specifically, it may be presumed, due to its similar functionality that previous research based on two-way messaging may apply. Many OTA faculty used the chat box as a teaching aid to reinforce instructions and engage with students asking them to share answers, opinions, and ideas. Anecdotally, faculty found that the use of a chat box feature was quite versatile and heavily utilized across each of their courses. OTA students often entered questions into the chat box which did not disrupt the flow of the lecture. Students presented questions and comments to the entire class as well as posted private chat comments directly to the faculty when it was personal in nature or when they seemed reluctant to share with others. Students provided comments to other

classmates and provided positive and constructive feedback following presentations. Group written work was submitted through the chat box for all to view. For example, when practicing writing SOAP notes, groups of students were able to submit what their group came up with. Then, in a large group discussion with the instructor, all students could review and provide feedback regarding the accuracy and appropriateness of each section of the SOAP note. In setting up a competition-type learning activity, chat boxes were utilized to solicit quick responses to questions posed by the instructor, without needing to employ a poll or SRS which could require additional time for setup. Students who responded accurately the quickest would be the “winner” for that round.

Muddiest Point. The Muddiest Point (MPT) classroom assessment technique requires that students submit a short written response indicating the one concept that they found to be least clear during class (Angelo & Cross, 1993). The teacher can then analyze those responses and allow for additional time to discuss those ideas that were most confusing (Angelo & Cross, 1993). Results regarding its effectiveness are mixed. In one study by Bullock et al. (2018), a majority of pharmacy students felt that utilizing the MPT technique as part of their exam review was beneficial and helped with their own learning. Similarly, in a study by Aycock et al. (2018), a slight majority of physician assistant students believed use of the MPT helped in laboratory skills training. Wise (2004) reported improved course evaluation scores with the institution of the MPT into a physical therapy course. However, a study by Simpson-Beck (2011) showed that the incorporation of the MPT technique did not lead to improved grades as compared to a control group in an undergraduate course.

A benefit of this technique is in its ability to quickly glean information. For instance, students in an OTA pediatrics course were asked to send a MPT submission through the chat box at the end of each week’s lecture to bring attention to the one concept that they still did not understand following the lecture. Submissions were sent privately to the course faculty or to the class. The faculty was then able to respond immediately to concepts students reported at the end of class or plan a more detailed refresher at the beginning of next week’s lecture.

Lab Kits

In lieu of being able to participate in in-person labs and practical examinations, the synchronous virtual classroom was utilized as a medium in which to conduct these activities. In order to ensure students had the needed supplies, lab kits were developed and sent to all enrolled students’ homes for the pediatrics intervention course.

The authors could not locate use of lab kits in OT or OTA education; however, literature is available describing the utilization of lab kits in other science based and healthcare curriculum. Lab kits have been effectively used in a variety of courses from secondary education to college level courses primarily for biology and computer science (Adeoye & Abimbola, 2016; Brewer et al., 2013; Onanuga et al., 2019). Brewer et al. (2013) developed an online version of their chemistry course incorporating the effective use of lab kits. They found that both the in-person and online courses were adequate to meet course criteria and students’ learning needs (Brewer et al., 2013). Kelly et al. (n.d.)

examined nursing students' perceived value and skill development when provided lab kits to go along with coursework. Students reported feeling more confident in the new skills they were able to develop having access to the materials they needed for lab (Kelly et al., n.d.). The faculty reported that they liked that the students had access to needed materials for their lectures/labs (Kelley et al., n.d.). In a narrative review by Faulconer and Gruss (2018) examining distance science labs, the authors concluded that "a well-designed, non-traditional lab can be as effective as a traditional face-to-face laboratory experience when measuring either content knowledge of student opinions as the metric for equivalence" (p.162).

For the pediatrics intervention course, the OTA student lab kit included a variety of items including adapted scissors, pencil grips, magic sand, fine motor toys, puzzles, and games to name a few. By providing access to tools and resources via the kit, students were able to follow along with online lecture and lab experiences. Additionally, the lab kits helped support in many other learning contexts; for example, when reviewing case studies and intervention planning. Students engaged in online discussion focused on assessing the items and materials for therapeutic value, and the kit was used as part of the final practical examination. The practical final examination required the students to develop a detailed therapy session utilizing only the supplies in the lab kit following an assigned case study to evaluate application of skills.

Learning Management System

Learning management systems (LMS) are "enterprise-wide and internet-based systems, such as WebCT and Blackboard, that integrate a wide range of pedagogical and course administration tools" (Coates et al., 2005, p.19). While each LMS will differ, a majority provide tools which allow for "asynchronous and synchronous communication..., content development and delivery..., formative and summative assessment..., and class and user management" (Coates et al., 2005, p.20-21). Several studies have concluded that students and teachers have favorable opinions regarding the use of LMSs in education and their contribution to learning (Alshorman & Bawaneh, 2018; Min et al., 2012; Rahman et al., 2019). In order to support their online teaching endeavors, OTA faculty utilized multiple features of their LMS to bolster learning and to create varied opportunities for engagement in course content.

Discussion Forum

Discussion forums, or asynchronous threaded discussions, allow for students to post on a given topic, and their peers' responses to that topic. Well-structured forums have been shown to encourage reflection and critical thinking skills and allow for all students to more fully participate in classroom discussions (Joyner, 2012; McNamara & Brown, 2009; Meyer, 2003; Rizopoulos & McCarthy, 2009; Weasenforth et al., 2002). OTA faculty utilized discussion forums on our university's LMS, Canvas, to allow students to post questions for clarification, for faculty driven weekly content, as well as to generate dialogue among students and between students and faculty.

One type of a structured discussion forum OTA faculty utilized was a 'gallery walk'. Traditionally speaking, a gallery walk would require a student or a group of students to rotate between stations set up throughout a classroom where they are asked to add to each posted question. In this way, previous responses can be reviewed and critiqued and, in the end, synthesized to the class at large. Although research on this technique is limited, researchers who adapted this technique found it to be effective for teaching a broad range of topics including science, language, and medical concepts (Francek, 2006; McCafferty & Beaudry, 2017; Namaziandost et al., 2018; Rodenbaugh, 2015).

As part of a virtual gallery walk for a pediatric conditions course, students were asked to rotate through different discussion threads posted by the course faculty on the LMS. In this example, the course faculty highlighted a specific condition (e.g. Down Syndrome), and then asked students to post activity ideas related to impacted client factors as related to said condition (e.g. core strengthening, oral motor skills, handwriting, dressing skills, fine motor strengthening). Students were challenged to not duplicate an answer provided by another classmate which encouraged creativity.

One-Minute Paper. The one-minute paper (OMP) is another classroom assessment technique which most often requires that students briefly write their answers to two questions – one regarding the most important thing learned in the day's class, and the other, to describe what question they have or what may still be most confusing (Stead, 2005). Students are given approximately one minute to write their responses to these questions, after which, the faculty can read through and respond (Stead, 2005). There are a wide variety of variations of this central idea that have been employed and studied across academia related to how and when the OMP is employed as well as questions asked (Stead, 2005). And for the most part, when not used in excess, the OMP is generally seen by both students and faculty as having value which may also improve classroom performance (Anderson & Burns, 2013; Chizmar & Ostrosky, 1998; Stead, 2005; Whittard, 2015). In a study by Campbell et al. (2019), the OMP was utilized as part of a virtual master's level social work course. It was ultimately found to be a useful formative assessment in the online environment, helping students to integrate knowledge and exchange ideas with fellow students and faculty.

The OMP was utilized as part of a professional seminar course as a means to gauge student understanding of material and promote reflection and discussion. Typically, students were asked to summarize the main content of the day's lecture. Some examples of an OMP asked that students write for one minute on what it meant to be a leader, on how to advocate within the profession as a student, and about their biggest concern regarding upcoming Level II fieldwork. Thoughts were either emailed to the course faculty or posted as part of a discussion thread for faculty review and response.

Student-Generated Videos. Student-generated videos have been used in academia as an alternative medium to assess student performance demonstrating specific skills. Studies have shown that their use can enhance student motivation as well as support accomplishment of course objectives (Erdmann, 2015; Omar et al., 2013; Thomas & Marks, 2014).

Student-generated videos were used in many OTA courses during these two semesters for students to demonstrate clinical skills, simulate client interactions, and receive feedback on performance. In a course focused on communication techniques, students recorded videos of themselves simulating teaching a client needed health information utilizing health literacy techniques and strategies taught in class. And as part of an alternate pediatric fieldwork experience, after watching a video of a child and completing the Hawaii Early Learning Profile to track development, students were then tasked with recording a video of themselves explaining the results of the assessment and their recommendations for follow-up care as if they were speaking to the child's parent.

Assessment

The aforementioned strategies were evaluated using a 10 item, 5-point Likert scale (1=Not helpful, 5=Extremely helpful) developed by faculty (see Table 2). The anonymous survey was disseminated to all OTA students at the end of the summer 2020 term.

Table 2

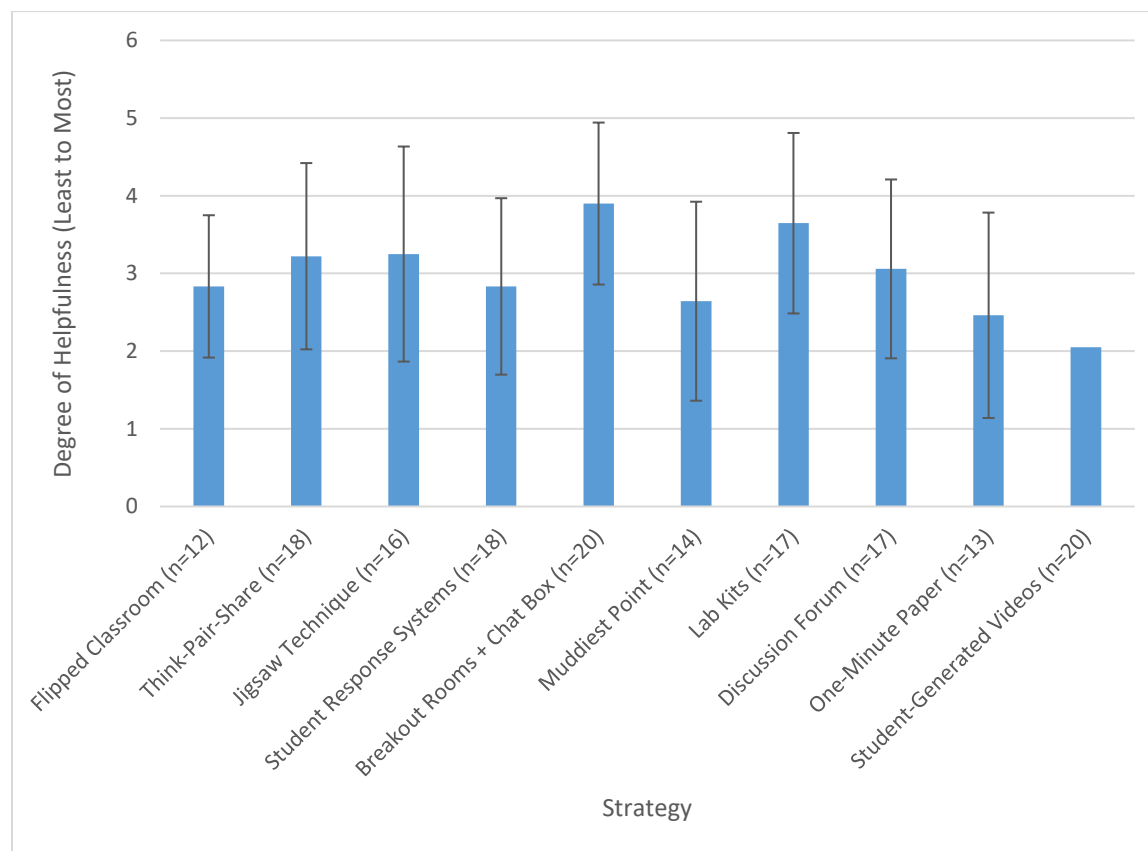
Survey Questions

1. How helpful was the use of Think-Pair-Share activities to your virtual learning? (This was the activity where you considered a question or article, shared your ideas in a small group, and then shared with the large group – used in [course #s])
2. How helpful was the use of One Minute Paper activities to your virtual learning? (This was the activity when you were given a prompt and asked to write for exactly 1 minute on a topic – used in [course #s])
3. How helpful was the use of Kahoot activities to your virtual learning? (Online surveys – used in [course #s])
4. How helpful was the use of Muddiest Point activities to your virtual learning? (This was the activity where you typed into the chat box on what you were still confused about – used in [course #s])
5. How helpful was the use of Jigsaw activities to your virtual learning? (This was the activity when you moved around into different breakout rooms to discuss a topic – used in [course #s])
6. How helpful was the use of the discussion forums in Canvas to your virtual learning? (Discussion forums used in Canvas to discuss a topic – used in [course #s])
7. How helpful was the use of Kaltura videos to your virtual learning? (Platform for video recording in Canvas – used in [course #s])
8. How helpful was the use of the breakout rooms and the chat box to your virtual learning? (Features in Zoom – used in [course #s])
9. How helpful was the use of the flipped classroom to your virtual learning? (Researching a topic and then teaching to your peers – used in [course #s])
10. How helpful was the use of the lab kits to your virtual learning? (Used in [course #s])

As students represented two cohorts taking different courses, an option to choose N/A was available if that strategy was not used in their course. In total, 8 newly admitted students and 22 continuing students were asked to provide their feedback to the survey. Twenty responded (three newly admitted students and 17 continuing students). The Institutional Review Board deemed this survey as exempt status. Data collected were analyzed using descriptive statistics and reported as mean \pm standard deviation (see Figure 1).

Figure 1

Student Survey Results Expressed as Mean Response \pm Standard Deviation



Discussion

Active learning strategies utilized by OTA faculty during online course instruction were viewed by student respondents as moderately effective. Research has previously demonstrated that a variety of activities may lead to student engagement in online classes, but those that promote student-student and instructor-student communication channels have been found to be most strongly correlated to higher student engagement (Dixson, 2010). This seems relevant to our results, where students found using the breakout room and chat features of the synchronous virtual classroom platform as well as lab kits to be most helpful. On the other end, student-generated videos were viewed as least helpful. Several students did report issues with using the LMS supported video

platform, which may have contributed to why they perceived this as less helpful than other strategies. This difficulty has been echoed in previous research involving student-generated videos (Thomas & Marks, 2014). The use of the OMP was viewed as only marginally helpful, as well. Since they must be completed at the end of class, timing may have been challenging for students. This sentiment was expressed in Stead's (2005) research, whereby a popular criticism of the OMP was that students had to stay longer, even if the activity occurred during class times. Additionally, it was noted by faculty that oftentimes responses solicited by this activity were not the most meaningful. Given the lack of depth, it is possible that students found the activity to be redundant of lecture content which led to less reflective responses. This critique was also discussed in Stead's (2005) research where students were critical of the OMP when they felt as though they did not have any questions but were still required to complete the activity or felt it was repetitious of lecture materials. Overall, though, it appears that these active learning strategies may still hold value in an online learning format.

Limitations

There were several limitations. First, sample size was low and while response rate was acceptable at 66%, there are considerations regarding any prejudicial responses based upon who self-selects to take the survey. Self-reported answers may be exaggerated or there is the risk of social desirability bias. Additionally, given limited research on the active learning strategies described in the OT and OTA education research, we are not able to compare this data with other results to determine if they were more, less, or equally effective in an online learning format compared to an in-person setting. To add, while the students self-identified which strategies they found most helpful, we were not able to correlate this information to individual course performance. A pre-test survey was not conducted which could provide information to account for students' prior experience and impacts on other performance variables. Given that strategies were utilized sporadically over two semesters (Spring and Summer 2020), it is also possible that students could not recall if the strategies were helpful at the time they completed the survey.

Implications for Occupational Therapy Education

Our findings and experiences described provide OTA faculty around the country examples of active learning strategies that can be implemented in an online teaching environment. Student engagement is critical for acquisition of knowledge and skills, and it appears that the breakout activities, chat box, and lab kits could be important strategies for educators to implement during the delivery of coursework offered online which has become a growing trend due to the pandemic's in-person restrictions. The strategies and examples we have outlined can be used practically by educators immediately as well as can inform educational research that can contribute to the body of knowledge regarding effective online teaching-learning strategies that can prepare students to become competent OTA professionals. Additionally, given that there is an increase in offering tele-rehabilitation services virtually, many of the active learning strategies students were exposed to have the potential for graduates to integrate into virtual delivery of OT treatment.

Further inquiry is needed to clarify if these and other active learning strategies outlined in this paper, when used in an online environment, are as effective as in an in-person environment to adequately prepare students to be competent OTA professionals. Additional research could focus on manualizing some of these strategies to ensure faculty implements them consistently. Further research is needed to look at varying active learning strategies and the impact on fieldwork performance and ultimately national board exam scores. As online learning allows for additional flexibility and cost savings for students, if findings yield positive results, this format should be considered as an acceptable, and perhaps favorable, alternative for certain OTA coursework. Finally, with sufficient planning and development, it could even lead to fully online OTA programs.

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