Journal of Occupational Therapy Education

Volume 3 | Issue 3 Original Research Article 7

2019

Student Perceptions and Grade Comparisons after Exposure to Instructor-Made Skills Videos in a Kinesiology Course

Pamela Karp
New York Institute of Technology

Robert G. Gallagher
New York Institute of Technology

Recommended Citation

Karp, P., & Gallagher, R. G. (2019). Student Perceptions and Grade Comparisons after Exposure to Instructor-Made Skills Videos in a Kinesiology Course. *Journal of Occupational Therapy Education, 3* (3). https://doi.org/10.26681/jote.2019.030307

Student Perceptions and Grade Comparisons after Exposure to Instructor-Made Skills Videos in a Kinesiology Course

Abstract
The purpose of this mixed method, descriptive case study was to determine whether the use of pre-recorded instructor-made videos (PRIMVs) in a kinesiology course, along with curricular design changes, facilitated increased conceptual and practical student learning. The study examined three student cohorts in one occupational therapy program. Two of the student cohorts had unrestricted access to the PRIMVs designed to support student learning of bone and muscle palpation and joint actions. Students from the two cohorts completed a survey about their experience of having access to the videos. Exam data from the student cohorts who had access to the videos was compared to exam data from an earlier cohort who had not been exposed to the videos. While no significant differences in the lab exam grades were noted, quantitative and qualitative data collected from the surveys revealed that students perceived that their overall course grade was higher and they were better prepared for clinical fieldwork as a result of having access to the videos. This study adds to the growing body of evidence that supports video technology as a supplemental learning tool in occupational therapy education.

Keywords
Mixed methods, curriculum design, digital technology

Acknowledgements
The authors would like to thank Gordon Schmidt, Ph.D., FACSM, Dean of the School of Health Professions at New York Institute of Technology. Dean Schmidt's guidance through the process of organizing and analyzing the data in the study was instrumental to the development of this work. The authors would also like to acknowledge the occupational therapy students who participated in the study.

JOTE Journal of Occupational Therapy Education

Volume 3, Issue 3

Student Perceptions and Grade Comparisons after Exposure to Instructor-Made Skills Videos in a Kinesiology Course

Pamela Karp, Ed.D, OTR/L, CHT

Robert G. Gallagher, D.C., MBA, CSCS, ACSM EP-C

New York Institute of Technology

United States

ABSTRACT

The purpose of this mixed method, descriptive case study was to determine whether the use of pre-recorded instructor-made videos (PRIMVs) in a kinesiology course, along with curricular design changes, facilitated increased conceptual and practical student learning. The study examined three student cohorts in one occupational therapy program. Two of the student cohorts had unrestricted access to the PRIMVs designed to support student learning of bone and muscle palpation and joint actions. Students from the two cohorts completed a survey about their experience of having access to the videos. Exam data from the student cohorts who had access to the videos was compared to exam data from an earlier cohort who had not been exposed to the videos. While no significant differences in the lab exam grades were noted, quantitative and qualitative data collected from the surveys revealed that students perceived that their overall course grade was higher and they were better prepared for clinical fieldwork as a result of having access to the videos. This study adds to the growing body of evidence that supports video technology as a supplemental learning tool in occupational therapy education.

INTRODUCTION

As health care in the 21st century becomes increasingly more complex and diversified, occupational therapy educators have the responsibility of expanding their curriculums and implementing high-impact, creative teaching practices that support student learning and facilitate effective clinical reasoning into professional practice. Teaching and learning in higher education must meet the challenges of today's rapidly evolving educational environments. This can be accomplished by incorporating technologies that current students readily interact with and which facilitate flexibility in learning (Boateng, Boateng, Awuah, Ansong, & Anderson, 2016; Kelly, Lyng, McGrath, & Cannon, 2009). A flexible learning environment, which supports independent learning, may be a desirable component of a learning environment for the student in higher education. Students appear to respond favorably to increased independent decision-making and the opportunity to self-direct their learning (Thiele, 2003).

LITERATURE REVIEW

There is a significant amount of literature which confirms the growing inefficacy of traditional lecture-based teaching format, especially in light of the unique learning preferences identified in millennial learners (Mortensen & Nicholson, 2015; Roehl, Leddy, & Shannon, 2013). The infusion of technology into higher education has altered the course of the traditional lecture-based platform, expanding the experience of learning for students (Milliken & Barnes, 2002). Today, teaching methods are often enhanced with a variety of technological applications (Kirkwood & Price, 2014) and used to reconceptualize learning through such approaches as the flipped classroom model (McNally et al., 2017; Thai, De Wever, & Valcke, 2017).

While flipped classroom models offer one transformative approach to teaching, much of the technology in education today is used to develop supplemental materials that can be incorporated into current teaching practices (Kirkwood & Price 2014). One such technology is the use of video recording. Video-based pedagogy has been employed in educational settings for many years but has become a more popular tool with the growth and development of social media and web-based technologies (Mykhnenko, 2016). Video recording, used in teaching and learning environments, can take on multiple forms, be distributed across a diverse array of platforms, and support varied teaching and learning objectives (Winslett, 2014).

Student-generated Videos

Active learning, through student engagement, has been shown to increase student comprehension and intrinsic sense of mastery (Choi & Rhee, 2014; Pirhonen & Rasi, 2017). Orús et al. (2016) conducted a YouTube® video-making project with 125 student participants in an introductory, undergraduate marketing course. The authors hypothesized that video creation by the students would positively affect cross-curricular competencies, subjective and overall satisfaction with academic performance and the overall course. Although results of the study did not directly support changes in subjective learning or course satisfaction, direct positive effects were noted on academic performance and cross-curricular competencies.

Digital video creation by students can support collaborative learning, deeper and more meaningful learning, and creativity through media expression (Koehler et al., 2011). In a qualitative study which examined video production in an Australian pre-service teacher education program, Kearney (2013) found that students' development of their videos, and the feedback received from their peers, contributed to their increased

DOI: 10.26681/jote.2019.030307

understanding of the material and their internal sense of competence. Further analysis found that overall attitudes towards technology as a pedagogical tool were positively affected.

Live Lecture Recording

Educators are now taking advantage of available classroom technology by recording their lectures and disseminating the recordings to students as a supplemental learning tool. Higher education institutions are investing in an array of available technologies to facilitate this lecture capture process (Edwards & Clinton, 2018). However, research has produced mixed results on the efficacy of this educational tool. Studies have found that student attendance in face-to face instruction can significantly drop with the availability of recorded lectures. This decrease in attendance has been shown to correlate with decreased exam and final grades (Edwards & Clinton, 2018; Newman-Ford, Fitzgibbon, Lloyd, & Thomas, 2008).

Other studies which examined the efficacy of video lecture capture had different results. Danielson, Preast, Bender, and Hassall (2014) utilized video lecture capture technology in a series of related studies involving veterinary medicine students. The authors found that the perceived efficacy of video lecture capture was very much dependent on the type of course in which it was used. Courses that traditionally were lecture-heavy, with content that was basic in nature, attained higher viewing rates than courses which were a mix of lecture, group, and lab work. The authors also found that higher viewing rates led to increased perception of learning by students. Kelly et al. (2009) examined the use of pre-recorded instructional videos by undergraduate nursing students and found that students reported increased motivation for learning, and increased perception of readiness for practice. Dona et al. (2017) studied the use of unscripted video lecture recordings in one institution. The authors found that 71% of the students who completed their survey perceived the inclusion of recorded lectures as a good supplemental learning tool.

Case-based Video

The development of clinical reasoning is a critical component of occupational therapy education. Case-based learning, often referred to as problem-based learning, is a fundamental method used by occupational therapy educators to facilitate the development of clinical reasoning skills in students (Scaffa & Wooster, 2004). Using case-based videos has become an increasingly popular educational tool to support clinical reasoning development. Using a pre- and pos-test, quasi-experimental approach, Murphy and Stav (2018) compared the use of text-based cases to video-based cases in the development of clinical reasoning skills in occupational therapy students. The authors determined that the use of case-based videos facilitated a “richer and more authentic experience” (p. 8) that supported students’ inductive reasoning skills. However, no statistically significant differences were found in overall clinical reasoning.

Problem-based learning is also used in medical education to facilitate development of the cognitive processes necessary for clinical reasoning. In a crossover study conducted with 165 second year medical students and 18 tutors, Basu-Roy and McMahon (2012) sought to determine if case-based videos stimulated deep critical thinking. The authors found that while both students and tutors preferred this method, they also found that those students (as opposed to those who used the text-based version) engaged in less instances of deep critical thinking, with a shift to more superficial thinking, as measured by critical thinking ratios.

Pre-recorded Instructional Videos

Multimedia instructional videos, pre-recorded and disseminated to students through a variety of platforms, are an increasingly popular way for instructors to supplement traditional text and classroom-based learning. However, there are inherent issues that warrant mention. First, such videos are often lengthy, creating a challenging environment for students to maintain interest and focus. Second, video quality may be poor, detracting from the learning experience (Pan et al., 2012).

Instructor-made videos (IMVs), can have a positive impact as a supplemental tool for learning, when consciously designed to minimize extraneous cognitive load and promote student engagement (Brame, 2015; Pociask, DiZazzo-Miller, & Samuel, 2013). Alpert (2016) defined and described the concept of “Video Instructor Designed and Starring” (VIDS; p. 2) as a means of complementing the innate drive of todays’ digital learners. In short, VIDS are not an alternative to the live lecture format, but can be used as a tool to motivate students to attend and engage within the live lecture environment. In VIDS, the video becomes a “*continuation* of the instructor’s lecture” (p. 4). A defining feature of VIDS are their low-budget, simple production concept which enables focus on the content.

To enhance learning in a kinesiology course in an occupational therapy program, McAlister (2014) filmed in-class demonstrations of manual muscle testing and goniometry and then made the videos available on YouTube. Students were surveyed about their perceptions of the videos as a supplemental learning tool. Study results revealed that students appreciated the flexibility of being able to repeatedly return to the material.

In summary, the use of video recording to enhance learning can be accomplished in multiple ways. While there are drawbacks, the potential of such technological practices has been shown to be a perceived benefit by students. This current study, similar to McAlister’s (2014) research, focused on a kinesiology course in an occupational therapy program. Unlike McAlister, the pre-recorded instructor-made videos (PRIMVs) used in this current study were pre-recorded outside of regular class time and made available following the face-to-face lab instruction. This method enabled the instructor to carefully script and film each of the videos while allowing students to be more observant of the instructor demonstrations rather than focused on recording the instructor.

The purpose of this mixed method, descriptive case study was to determine whether the use of PRIMVs in a kinesiology course, along with curricular design changes, facilitated increased conceptual and practical student learning. The study sought to answer two

DOI: 10.26681/jote.2019.030307

research questions. First, does the addition of PRIMVs facilitate improvement in kinesiology lab exam scores? Second, does the addition of PRIMVs in kinesiology alter students' perception and does viewing time influence their understanding of the material presented?

METHODS

Participants

This study used a convenience sample of occupational therapy students spanning three different cohorts, in one university program. Student subjects in Group 1 completed the kinesiology coursework under the original curriculum design and did not have access to the PRIMVs. At the time Group 1 students were enrolled in the kinesiology course, the videos had not been created. In the original curriculum design, kinesiology was offered in the summer of the second year of the program, one year after students had completed gross anatomy. Student subjects in Group 2 completed kinesiology under the original curriculum design and had access to the PRIMVs. Student subjects in Group 3 completed kinesiology under the new curriculum design and had access to the PRIMVs. In the new curriculum design, kinesiology was offered in the fall of the first year of the program, directly following the summer gross anatomy course. Figure 1 illustrates the sample.

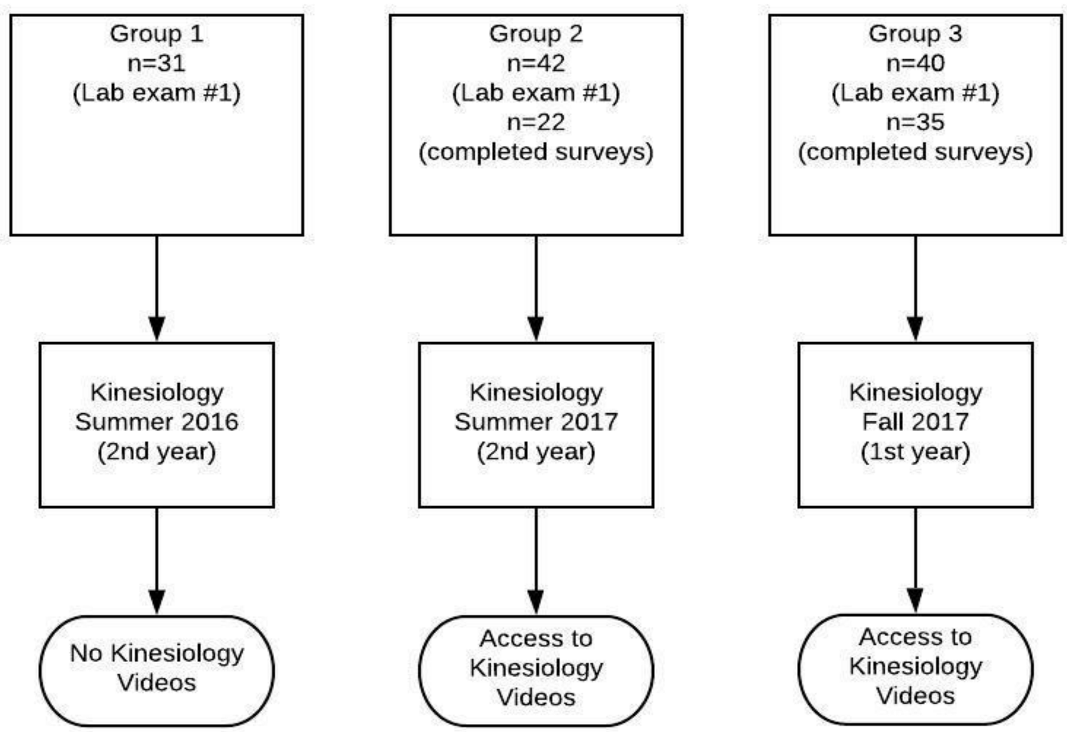

Figure 1. Convenience sample breakdown by cohort group. The vertical tree illustrates the different versions of the curriculum to which each group was exposed and which group had access to the pre-recorded instructor made videos. Created using Lucidchart.

Exam data from 31 students in Group 1, 42 students in Group 2, and 40 students in Group 3 were collected and analyzed. Students in Groups 2 and 3, who had access to the PRIMVs, were provided a link to an anonymous survey created by the researchers. Submission of the survey indicated the student's acknowledgement and consent that the data collected would be used in the study. Inclusion criteria included current enrollment in the kinesiology course.

The original survey was piloted with eight student volunteers consisting of four from Group 2 and four from Group 3. The students completed the questions and then participated in a one-hour focus group with the researchers. The survey was revised based on the feedback obtained from the focus group discussion.

The final version of the survey consisted of 20 questions designed to collect demographics, self-reported video viewing information, and perceptions about video accessibility and effectiveness as a learning tool. Self-perception questions utilized a 5-point Likert scale, which ranged from *strongly disagree* to *strongly agree* to illustrate students' agreement with each statement. Open-ended questions allowed students to elaborate on their responses and provide more detailed responses to questions asked about the perceived efficacy of the videos. The survey was uploaded to the SurveyMonkey® platform and a link was provided to all students in Group 2 and Group 3. Students indicated their consent at the start of the survey and were then directed to answer the survey questions. Participation was anonymous.

Research Design

This descriptive study used a concurrent, embedded mixed methods design to gather quantitative and qualitative data about a sample population of students at a specific point in their curriculum. The embedded design is illustrated in figure 2.

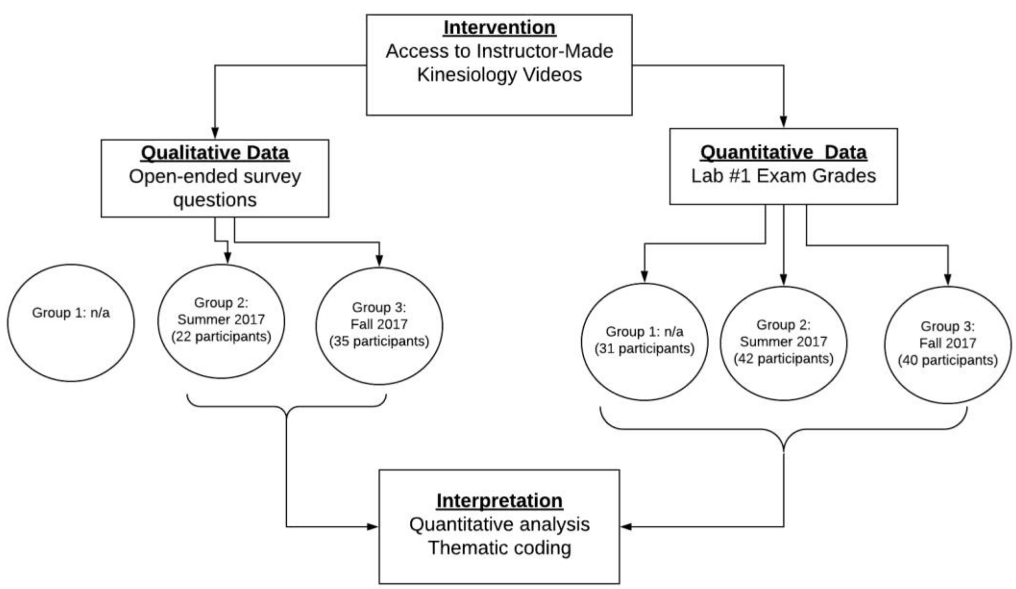

Figure 2. Embedded mixed-methods design. This matrix illustrates the mixed methods study design based on quantitative and qualitative data collected to address the study questions.

DOI: 10.26681/jote.2019.030307

Creswell and Creswell (2018) suggest that the mixed-method embedded design enables the researcher to analyze data in a broad manner since the design allows for the collection of both qualitative and quantitative information that can be used to answer the proposed research question. All of data was collected concurrently, at the conclusion of the fall 2017 semester. Collection of both quantitative and qualitative data was necessary to ensure that the research questions could be fully explored. An embedded mixed-methods design was prudent so that both objective data and student perspectives could be analyzed to determine changes in conceptual and practical learning following use of the PRIMVs.

The Institutional Review Board at the institution where the research was conducted approved the study as exempt. Students in Groups 2 and 3 were given access to three sets of videos that were created by the kinesiology course instructor, who was also a co-researcher on the study. Access to the PRIMVs was given to the students at the beginning of the course. The material in the videos was developed to enhance learning in three areas: bone palpation, muscle palpation, and joint actions. The PRIMVs consisted of 16 bone palpation videos, 44 muscle palpation videos, and nine videos on joint actions. The average running time of each video was 1 minute and 17 seconds. The shortest video provided had a running time of 41 seconds. The longest video was three minutes and 34 seconds. The videos were uploaded to the instructors' YouTube® channel, which permitted unlimited access to the videos. Students in Groups 2 and 3 were given access to the online anonymous survey in the spring of 2018.

Data Analysis

Quantitative data collected from the completed surveys was imported into SPSS version 25 for statistical analysis. Means and standard deviations were calculated for the lab exam #1 averages of each student group and are presented in Table 1. The PRIMVs only included material that students could be tested on in lab exam #1. Therefore, only those grades were chosen for descriptive analysis. Data received from the survey responses were analyzed using the Jonkheere-Terpstra rank-based non-parametric test. The intent was to examine trends between the number of times students reported viewing the videos and perceptions regarding their overall learning experience, final course grade, and preparedness for clinical fieldwork.

Table 1

Means and Standard Deviations on Kinesiology Lab Exam #1 Grades for Three Class Cohorts

			Lab Exam # 1 Averages	
Student Group	Course Taken	*n*	*M*	*SD*
Group 1	Summer 2016	31	87.5	11.49
Group 2	Summer 2017	42	87.4	9.73
Group 3	Fall 2017	40	90.0	6.49

Note: n represents the total number of students enrolled in each class. Only Group 2 and Group 3 had access to the videos and survey.

Qualitative data obtained from the open-ended questions were subjected to two coding cycles. First, descriptive codes from the responses were developed. Next, descriptive codes were further refined using focused coding that enabled thematic analysis of the data.

RESULTS

Quantitative Data

Of the 82 students in Groups 2 and 3, 57 completed the online survey. This consisted of fifty-two participants who identified as female (91.2%) and five who identified as male (8.8%). Forty-nine of the survey participants were between 18 and 24 years of age (86%) and eight were 25 years of age or older (14%). Twenty-two of the 42 students in Group 2 completed the survey. This student cohort was following an older curriculum structure in which kinesiology took place in the summer of the second year of the program. Thirty-five of the 40 students in Group 3 completed the survey. This student cohort was following the new curriculum structure in which kinesiology took place in the fall of the first year of the program.

The Jonckheere-Terpstra test was used to determine the presence of statistically significant trends in student perceptions about their overall learning experience, final course grade, and increase in preparedness for clinical fieldwork in relation to the number of times students watched the PRIMVs. Students perceived that they achieved higher overall course grades as viewing times increased related to bone palpation (T_{JTbone} =429.50, z=2.495, p<.05), muscle palpation ($T_{JTmuscle}$ = 447.00, z = 2.905, p< .005), and joint actions ($T_{JTjoint}$ =376.00, z = 2.024, p< .05). Similarly, students perceived that they were more prepared for clinical fieldwork as viewing time increased for bone palpation (T_{JTbone} =311.00, z=2.519, p<.05), muscle palpation ($T_{JTmuscle}$ = 292.50, z = 1.971, p< .05), and joint actions ($T_{JTjoint}$ =276.00, z=2.287, p< .05). Finally, students perceived that their overall learning experience had been enhanced as viewing time increased for muscle palpation videos ($T_{JTmuscle}$ = 330.00, z = 2.094, p< .05).

A one-way between subjects ANOVA was conducted to determine if the addition of the PRIMVs had an effect on lab # 1 exam grades when the three student groups were compared. The lab exam # 1 grades can be found in Table 1. Group 1 did not have access to the PRIMVs. Groups 2 and 3 had access to the PRIMVs. No significant differences in the exam grades were apparent, at the p<.05 level of significance [$F(2, 110) = 0.771$, p = .465].

Although Groups 2 and 3 had access to the PRIMVs, these groups were taught kinesiology at different points in each of their respective curriculums. An independent T-test was conducted to determine statistical differences in the lab exam #1 grade averages for these groups. There was no significant effect at *p<.05* resulting from the changes in curriculum in the groups that had access to the videos [$t(79) = -0.05$, p =.958].

DOI: 10.26681/jote.2019.030307

Although there was no statistically significant difference in lab exam grades, students who watched the PRIMVs perceived that greater viewing time significantly contributed to higher overall course grades and better preparedness for clinical fieldwork.

Qualitative Data

The survey disseminated to students included two open-ended questions that requested perspective on individual likes/dislikes about the PRIMVs as a learning tool in kinesiology. First cycle descriptive coding methods were used to topically summarize student responses. To further analyze the descriptive codes, second cycle focused coding was used to reorganize the coded data into themes (Saldaña, 2016). The two emergent themes, developed in the second cycle coding process, illustrated further detail that was used in the qualitative analysis of student perceptions about the PRIMVs as a supplemental learning tool.

Theme 1: Self-Directed Learning. Student participants reported descriptors that characterized their perceptions about employing the videos as part of their independent study strategies. The format and presentation of the PRIMVs enabled them to incorporate this supplemental learning tool in ways that met their unique, learning styles.

Self-paced. The videos allowed students to pace their own learning. This was exemplified in one student's statement, "I didn't feel pressured to take notes during class which enabled me to listen more carefully." Another student remarked that the videos, "helped me practice and remember how to palpate muscles/structures in my own time."

Flexible. Students found that their learning was enhanced by the flexibility to return to the videos as needed. As one student stated, "I could watch it over and over again until I understood as opposed to taking up time in class." Another student exemplified flexibility noting that, "when I did not understand something, I had the opportunity to look at it more than once" and "I also liked being able to pause and follow along."

Individualized learning. Although the instructor informed the students that there are various methods to perform palpation and muscle testing, some students still commented that the techniques utilized in the videos sometimes varied from those demonstrated by the instructor during in-lab instruction. This was expressed in comments such as, "The videos were not always consistent with what was [demonstrated] in class." Most students found the videos to be an effective supplemental learning tool. One student described using the videos, stating, "viewing the videos multiple times helped me to practice." Another student reported that the videos were, "great for visual learners." One student shared that, "[when] I felt distracted during class, the videos did wonders in helping me figure out missing pieces."

Theme 2: Generalizability of Learning. Student participants described the videos as a learning technology that was easily applied not only to the classroom environment, but to clinical settings they will encounter as they progress through the program and into professional life. While students reported that the videos supported their learning, some also articulated the caveat that they should not be a substitute for face-to-face instruction.

Accessible learning. The videos were housed on a YouTube® channel and students were provided the link to view the videos. This format offered a learning platform that many students reported as easily accessible for continued use of the videos beyond classroom learning. One student articulated this benefit by stating the importance of, “being able to look back in case I forgot some details we learned in class.”

Classroom-to-clinic bridge. Student participants expressed appreciation for the PRIMVs as a supplemental learning tool that would continually support their development in the field, with one student noting, “It helped me think more clearly about the process of palpating” and “overall helped me better my skills.” Students were forward-thinking regarding the use of the videos to support learning beyond the kinesiology class, with one student remarking that he/she would, “use these videos in the future while working in the clinical setting.”

DISCUSSION

This study examined how PRIMVs would impact occupational therapy students’ performance in a kinesiology course as measured by lab exam grades. The study also elucidated how use of the videos affected student perceptions of their learning in the kinesiology course and their perceived readiness for clinical fieldwork experience. Only students in Group 2 (following the original curriculum design) and Group 3 (following the new curriculum design) had access to the videos.

The first research question attempted to determine if the inclusion of PRIMVs would facilitate improvement in kinesiology lab exam scores. The one-way between subjects ANOVA revealed no statistical differences in lab #1 exam grades between students in Groups 1, 2 and 3. For Groups 2 and 3, lab exam #1 included material that was presented in face-to-face instruction. The students in these groups also had access to this material through the PRIMVs. Group 1 was only exposed to the face-to-face instruction, as the PRIMVs had not yet been created. The independent T-test revealed no statistical differences in lab #1 exam grades between students in Group 2 and Group 3. Students in these groups had access to the PRIMVs but completed the kinesiology course in different academic years. Group 2 completed kinesiology in the second year of the program, one year after completing gross anatomy. Group 3 completed the same course in the first year of the program, in the semester following gross anatomy. The results of the statistical analyses indicated that neither the inclusion of the PRIMVs, or the curricular changes, had a significant effect on lab #1 exam grades.

Our review of the current body of literature related to health professions education did not reveal any studies that used lab exam grades as an outcome measure to determine the efficacy of instructor-made videos. Mehrpour, Aghamirsalim, Motamedi, Ardeshir Larijani, and Sorbi (2013) studied the effect of supplemental videos on medical

DOI: 10.26681/jote.2019.030307

students' clinical reasoning skills with regard to orthopedic splint and casting. The authors found that the addition of videos, as a supplemental learning tool, significantly influenced clinical competency as measured by the Objective Structured Clinical Examination (OSCE). While no statistically significant difference in lab exam grades was evident in this current study, the outcome measure used may not have been sufficiently sensitive to identify changes in students' clinical learning as a result of the addition of the PRIMVs.

The second research question attempted to determine if students' perceptions of their understanding of the material had been altered as an outcome of the addition of the PRIMVs and would viewing time influence those perceptions. The authors had hypothesized that student perceptions, as related to grades, preparation for clinical fieldwork, and overall learning experience, would incrementally increase as viewing of the PRIMVs increased. In the current study analysis, the Independent T-test revealed no statistical differences in the lab #1 exam grades when Group 2 and Group 3 were compared. Therefore, the Jonckheere-Terpstra test was used to determine if a significant ordered trend was present, which would illustrate stronger student perceptions in the three video categories as viewing increased. Results of the quantitative data analysis illustrated a statistically significant upward trend in two distinct areas related to student perceptions. First, the more frequently students watched the videos, the stronger they perceived their overall course grade improved. Second, the more frequently students watched the videos, the better prepared they felt for upcoming fieldwork experiences. A third statistically significant trend was found in relation to the muscle palpation videos. The more times students watched this series of videos, the stronger they perceived an enhancement in their overall learning experiences.

The significant trends noted in increasingly positive student perceptions of their overall learning, course grade, and preparedness for clinical fieldwork as their viewing increased, is further supported in the open-ended student comments and represented in the subsequent developed themes. Descriptive coding of student comments elucidated that their experiences with use of the PRIMVs supported their learning in both variable and translatable ways. The videos appeared to provide a practical learning experience that was useable beyond the classroom and conducive to individual learning styles. The availability of self-paced, flexible learning tools, such as the PRIMVs, appears to have facilitated an internal locus of control, fueling students' motivation to learn.

Student perception of enhanced learning experiences has been described by multiple authors (Boateng et al., 2016; Danielson et al., 2013; Rose, 2009). The positive perceptions exemplified by students in the current study is in line with previous research on video technology as a supplemental learning tool. In the current study, the qualitative data and subsequent analysis of the open-ended survey questions, completed by students in Groups 2 and 3, support the trend of enhanced perceptions validated by the quantitative analysis.

McAlister (2014) previously examined the use of supplemental videos in a kinesiology course. Videos used by McAlister were recorded in-the-moment, during live demonstrations in the classroom. The PRIMVs used in the current study were digitally recorded outside of class time. By planning and producing the videos in this way, the instructor was able to ensure that they accurately reflected appropriate ways in which the manual techniques could be performed. The instructor utilized colored resistance bands, placing them over the muscle being reviewed, to further illustrate the location of each muscle. In addition, to enhance student learning, the instructor articulated the origins, insertions, and actions of the muscles being palpated. In McAlister's study, qualitative summaries included participant comments about how the videos could be improved. This included improvement in speaker volume and video angles to enhance viewing of the techniques, in addition to better anatomy descriptors. The use of the pre-planned format and visualization techniques utilized by the instructor may be a reason student in the current study did not express similar comments as noted by McAlister. Students in both studies reported enhanced learning experiences. McAlister's key finding was students' appreciation of the accessibility of the videos, which could be used repeatedly as needed. The current study similarly found that flexibility and accessibility of the videos were well-supported qualitative themes. The comments received in the open-ended questions in the current study did not reveal the same weaknesses as noted by McAlister.

The current study added important information that can be used to support the efficacy of using videos as a supplemental learning tool. First, the more frequently students viewed the videos, the stronger their perceptions of enhanced learning. Second, the current study introduced quantitative grade analysis. While quantitative findings with regard to lab exam grades were not statistically significant, this is an avenue for future study. Such a study could address how PRIMVs, used as a supplemental learning tool, could be employed to support achievement of expected student-learning outcomes.

Limitations

There were some limitations in the current study which warrant discussion. First, while students were surveyed regarding perceived efficacy of the PRIMVs, they were not queried about the curricular changes that moved kinesiology from the summer of the second year to the fall of the first year of the program. The researchers were not able to ascertain the perceived impact of these changes across groups. Therefore, changes in the curriculum may have been a confounding factor. A second limitation is the sample size used in the study. The sample only consisted of students enrolled in one university program and therefore, results are not necessarily generalizable to all occupational therapy education curricula. Lastly, the use of lab exam #1 grade averages may not have fully reflected the impact of the PRIMVs on student learning.

IMPLICATIONS FOR FUTURE RESEARCH

The use of technology to support high impact teaching practices in learning environments warrants continued investigation. Occupational therapy education, similar to authentic practice, is multi-contextual. Therefore, teaching and learning tools that provide varied contextual experiences can further optimize student comprehension. To explore the effectiveness of PRIMVs as a supplemental learning tool, the researchers suggest replication of the study across future cohorts who are experiencing the same

DOI: 10.26681/jote.2019.030307

occupational therapy education curriculum. Revision of the instructor-made videos that include overt signaling (Brame, 2015; Pociask et al., 2013) to highlight technique variation may facilitate future research on the effects of supplemental learning tools on cognitive load and working memory. The researchers also suggest that future studies include a variety of outcome measures that are more sensitive to the nature of learning in a health education program. Other studies that explore faculty perceptions about the use of video, and their knowledge and skill level in creating and using such technology, would also be beneficial to increase the body of knowledge supporting the efficacy of occupational therapy education practices. In addition, it may be prudent to examine the effect different types of video production may have on student outcomes. A comparison of student-recorded, instructor-live recorded, and PRIMVs videos may be warranted.

CONCLUSION

This study provided both quantitative and qualitative data to further support the efficacy of using PRIMVs as a learning tool in an occupational therapy kinesiology course. The technology used to create the videos was readily available and did not require extensive funding. YouTube® was used as a free platform to disseminate the videos and allow for easy and continued access by students. As digital technology continues to advance and digital platforms are more readily designed for the average user, the power to produce high-quality, but low-budget videos can be harnessed by educators who do not necessarily have training or extensive skills in video production and editing.

Student perceptions of their learning are critically important as they develop self-awareness, confidence, and clinical competence that will facilitate practice. To support student growth in these areas, it is incumbent on occupational therapy educators to continually seek out and develop creative and effective teaching and learning tools. Results of this study highlight PRIMVs as a potentially effective strategy to support occupational therapy student learning and their self-perceived confidence early in their professional education program.

References

Alpert, F. (2016). Revitalizing the live lecture class with instructor-created videos. *SAGE Open*, *6*(4). https://doi.org/10.1177/2158244016680686

Basu-Roy, R., & McMahon, G. T. (2012). Video-based cases disrupt deep critical thinking in problem-based learning. *Medical Education*, *46*(4), 426–435. https://doi.org/10.1111/j.1365-2923.2011.04197.x

Boateng, R., Boateng, S. L., Awuah, R. B., Ansong, E., & Anderson, A. B. (2016). Videos in learning in higher education: Assessing perceptions and attitudes of students at the University of Ghana. *Smart Learning Environments*, *3*(1), 8. https://doi.org/10.1186/s40561-016-0031-5

Brame, C.J. (2015). Effective educational videos. Retrieved from http://cft.vanderbilt.edu/guides-sub-pages/effective-educational-videos/.

Choi, B. K., & Rhee, B. S. (2014). The influences of student engagement, institutional mission, and cooperative learning climate on the generic competency development of Korean undergraduate students. *Higher Education*, *67*(1), 1–18. https://doi.org/10.1007/s10734-013-9637-5

Creswell, J.W., & Creswell, J.D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Thousand Oaks, CA: Sage Publications. https://doi.org/10.5539/elt.v12n5p40

Danielson, J., Preast, V., Bender, H., & Hassall, L. (2014). Is the effectiveness of lecture capture related to teaching approach or content type? *Computers and Education*, *72*, 121–131. https://doi.org/10.1016/j.compedu.2013.10.016

Dona, K. L., Gregory, J., & Pechenkina, E. (2017). Lecture-recording technology in higher education : Exploring lecturer and student views across the disciplines. *Australasian Journal of Educational Technology*, *33*(4), 122–133. https://doi.org/10.14742/ajet.3068

Edwards, M. R., & Clinton, M. E. (2018). A study exploring the impact of lecture capture availability and lecture capture usage on student attendance and attainment. *Higher Education*, 1–19. https://doi.org/10.1007/s10734-018-0275-9

Kearney, M. (2013). Learner-generated digital video: Using ideas videos in teacher education. *Journal of Technology & Teacher Education*, *21*(3), 321–336. Retrieved from https://www.learntechlib.org/primary/p/41935/

Kelly, M., Lyng, C., McGrath, M., & Cannon, G. (2009). A multi-method study to determine the effectiveness of, and student attitudes to, online instructional videos for teaching clinical nursing skills. *Nurse Education Today*, *29*(3), 292–300. https://doi.org/10.1016/j.nedt.2008.09.004

Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: What is ‘enhanced’ and how do we know? A critical literature review. *Learning, Media and Technology*, *39*(1), 6–36. https://doi.org/10.1080/17439884.2013.770404

Koehler, M. J., Mishra, P., Bouck, E.C., DeSchryver, M., Kereluik, K., Shin, T. S., & Wolf, L. G. (2011). Deep-play : Developing TPACK for 21st century teachers. *International Journal of Learning Technology*, *6*(2), 146–163. https://doi.org/10.1504/ijlt.2011.042646

McAlister, R. B. (2014). Use of instructor-produced YouTube® videos to supplement manual skills training in occupational therapy education. *American Journal of Occupational Therapy, 68*(Supplement 2)*,* S67–S72. https://doi.org/10.5014/ajot.2014.685s04

McNally, B., Chipperfield, J., Dorsett, P., Del Fabbro, L., Frommolt, V., Goetz, S.,…Rung, A. (2017). Flipped classroom experiences: Student preferences and flip strategy in a higher education context. *Higher Education, 73*, 281-298. https://doi.org/10.1007/s10734-016-0014-z

Mehrpour, S. R., Aghamirsalim, M., Motamedi, S. M. K., Ardeshir Larijani, F., & Sorbi, R. (2013). A supplemental video teaching tool enhances splinting skills basic research. *Clinical Orthopaedics and Related Research*, *471*(2), 649–654. https://doi.org/10.1007/s11999-012-2638-3

Milliken, J., & Barnes, L. P. (2002). Teaching and technology in higher education: student perceptions and personal reflections. *Computers & Education*, *39*(3), 223–235. https://doi.org/10.1016/S0360-1315(02)00042-8

Mortensen, C.J., & Nicholson, A.M. (2015). The flipped classroom stimulates greater learning and is a modern 21st century approach to teaching today’s

DOI: 10.26681/jote.2019.030307

undergraduates. *Journal of Animal Science*, *93*(7), 3722-3731. https://doi.org/10.2527/jas.2015-9087
Murphy, L. F., & Stav, W. B. (2018). The impact of online video cases on clinical reasoning in occupational therapy education: A quantitative Analysis. *The Open Journal of Occupational Therapy*, *6*(3). https://doi.org/10.15453/2168-6408.1494
Mykhnenko, V. (2016). Cui bono? On the relative merits of technology-enhanced learning and teaching in higher education. *Journal of Geography in Higher Education*, *40*(4), 585–607. https://doi.org/10.1080/03098265.2016.1217832
Newman-Ford, L., Fitzgibbon, K., Lloyd, S., & Thomas, S. (2008). A large-scale investigation into the relationship between attendance and attainment: A study using an innovative, electronic attendance monitoring system. *Studies in Higher Education*, *33*(6), 699–717. https://doi.org/10.1080/03075070802457066
Orús, C., Barlés, M. J., Belanche, D., Casaló, L., Fraj, E., & Gurrea, R. (2016). The effects of learner-generated videos for YouTube on learning outcomes and satisfaction. *Computers and Education*, *95*, 254–269. http://doi.org/10.1016/j.compedu.2016.01.007
Pan, G., Starrett, D. A., Rodgers, M. L., & Powell, D. V. (2012). Instructor-made videos as a learner scaffolding tool. *MERLOT Journal of Online Teaching and Learning*, *8*(4), 298–311. Retrieved from http://jolt.merlot.org/vol8no4/pan_1212.pdf
Pirhonen, J., & Rasi, P. (2017). Student-generated instructional videos facilitate learning through positive emotions. *Journal of Biological Education*, *51*(3), 215–227. https://doi.org/10.1080/00219266.2016.1200647
Pociask, F. D., DiZazzo-Miller, R., & Samuel, P. S. (2013). Reducing cognitive load while teaching complex instruction to occupational therapy students*. American Journal of Occupational Therapy, 67*, e92–e99. https://dx.doi.org/10.5014/ajot.2013.008078
Roehl, A., Reddy, S.L., & Shannon, G.J. (2013). The flipped classroom: An opportunity to engage millennial students through active learning strategies. *Journal of Family and Consumer Sciences, 105*(2), 44-49. https://doi.org/10.14307/JFCS105.2.12
Rose, K. K. (2009). Student perceptions of the use of instructor-made videos in online and face-to-face classes. *Journal of Online Learning and Teaching*, *5*(3), 487–495.
Saldaña, J. (2016). *The coding manual for qualitative researchers, 3rd edition.* Thousand Oaks, CA: Sage Publications.
Scaffa, M. E., & Wooster, D. M. (2004). Brief Report—Effects of problem-based learning on clinical reasoning in occupational therapy. *American Journal of Occupational Therapy, 58,* 333–336. https://doi.org/10.5014/ajot.58.3.333
Thai, N. T., De Wever, B., & Valcke, M. (2017). The impact of a flipped classroom design on learning performance in higher education: Looking for the best "blend" of lectures and guiding questions with feedback. *Computers and Education*, *107*, 113–126. https://doi.org/10.1016/j.compedu.2017.01.003
Thiele, J. E. (2003). Learning patterns of online students. *The Journal of Nursing Education*, *42*(8), 364–6.
Winslett, G. (2014). What counts as educational video?: Working toward best practice alignment between video production approaches and outcomes. *Australasian*

Journal of Educational Technology, *30*(5), 487–502. https://doi.org/10.14742/ajet.458

DOI: 10.26681/jote.2019.030307