THE EFFECT OF ONLINE EDUCATION ON PRE-SERVICE TEACHERS'

KNOWLEDGE OF PEER TUTORING

By

Dominic Ratto

A Thesis Presented to

The Faculty of Humboldt State University

In Partial Fulfillment of the Requirements for the Degree

Master of Science in Kinesiology

Committee Membership

Dr. Rock Braithwaite, Committee Chair

Dr. Chris Hopper, Committee Member

Dr. Sean Healy, Committee Member

Dr. Sheila Alicea, Graduate Coordinator

December 2017

ABSTRACT

THE EFFECT OF ONLINE EDUCATION ON PRE-SERVICE TEACHERS'
KNOWLEDGE OF PEER TUTORING

Dominic Ratto

The purpose of this study was to find the effectiveness of online education compared to text-based education when teaching pre-service educators about peer tutoring in physical education. As students with disabilities are being more regularly included in general education classes, it is important that pre-service teachers have ample and quality opportunities to learn about important topics and strategies within education, such as peer tutoring. This study compared knowledge scores between the experimental group (online education) and the control group (text-based education). The online education group received the knowledge through podcasts that were created using Mayer's principles for multimedia learning. No significant differences were found between the two groups between the two groups on their knowledge of peer tutoring. Future research should explore using a larger population with a more diverse sample. Considerations for future research should also include length of intervention and the use of a knowledge retention test.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The Individuals with Disabilities Education Act (IDEA), enacted in 1975, mandates that children and youth ages 3-21 with disabilities are provided a free and appropriate public school education. Currently, this results in over 6.5 million students with disabilities in American public schools receiving special education services (U.S. Department of Education, 2003). Students with disabilities are also being increasingly included in general physical education (GPE) classes (Place & Hodge, 2001). According to the Governmental Accountability Office (GAO) (2010), 92% of elementary school students and 88% of secondary level students are included in GPE classes. However, the research on the attitudes of physical education teachers reveals that they do not always feel fully prepared for this task. Teachers of GPE classes have shown concern about having students with severe disabilities participate in class (Block & Zeman, 1996). With more students with disabilities being included in GPE, it is important for teachers to use evidence-based strategies to help all of their students be successful in learning and performing motor skills.

One evidence-based practice that has been shown to work for the inclusion of students with disabilities in physical education is peer tutoring. Peer tutoring involves students without disabilities working to help students who experience disabilities. These peer tutors are trained by their physical education (PE) teacher in how to utilize specific strategies – motivational strategies, providing instruction and feedback– to aid their peer tutee (Cervantes, Lieberman, Magnesio & Wood, 2013). In a recent study done by

Klavina and Rodianova (2015), middle school students with severe mental disabilities showed improvement in communicating with their peer tutors. An analysis of research on peer tutoring has also found that across age levels and types of disabilities, peer tutoring has been shown to be effective (Bowman-Perrot, Davis, Vannest, Williams, Greenwood & Parker, 2013).

Many educators have noted that they feel prepared for only certain aspects of working with students experiencing disabilities in a PE setting. While topics such as an overview of disabilities and modifications are common for introduction to adapted physical education (APE) courses in teacher preparation programs, other important topics such as assessment and individualized education plan (IEP) writing are often left out of the curriculum (Piletic & Davis, 2010). Because there is only limited time to educate pre-service physical educators through face to face course work, other methods must be considered to deliver APE content to pre-service teachers (Piletic & Davis, 2010). In order to educate pre-service teachers on evidence-based instructional strategies, such as peer tutoring, alternative strategies of teacher education must be evaluated: strategies that allow learning to occur on a more sustainable, scalable level, outside of the classroom. One low-cost means of delivering information is online education, in particular asynchronous online education that utilizes short podcasts to deliver information to the learner. An alternative, more traditional method is text-based learnings. Both options may be used to supplement current pre-service teacher preparation coursework. The purpose of this study is to examine the effectiveness of an online education courses on peer tutoring for pre-service teachers, in comparison to traditional text-based learning.

LITERATURE REVIEW

Inclusion in Physical Education

The inclusion of students experiencing disabilities in physical education is a philosophy that has been highlighted and utilized in recent years (Qi & Ha, 2012). Due to the increasing trend for inclusion in physical education, students experiencing disabilities have been joining their peers without disabilities in GPE classes more frequently (Place & Hodge, 2001). Yet previous research has shown mixed results about how pre-service educators feel about including students with disabilities into GPE class; for example, research by Mangope, Mannathoko and Kuyini (2013) involving a two-part questionnaire for PE student teachers demonstrated that pre-service teachers show positive attitudes towards including students who experience disabilities into their GPE classes. A review of the literature, however, by Block and Obrusnikova (2007), found that many GPE teachers have a negative perception about trying to include students with disabilities in their general PE class. Similarly, it was found that pre-service educators in Ireland felt as though they were not given enough time to learn about important topics about adapted physical education (Crawford, O'Reilly, & Flanagan, 2012). These pre-service teachers also felt as though their consequential lack of professional development hindered their ability to teach with as much knowledge and preparation as possible (Crawford, O'Reilly, & Flanagan, 2012). This lack of understanding and preparation can potentially lead general physical education teachers to have negative misconceptions about including students with disabilities in their GPE classes (Block & Obrusnikova,

2007). Physical Education Teacher Education (PETE) programs are not meeting the needs of the teachers in the area of adapted physical education.

Pre-service Training

Research by Piletic and Davis (2010) showed that pre-service physical educators are not given ample, quality opportunities to learn about teaching students with disabilities in PETE programs. According to Piletic and Davis (2010), 52% of PETE programs at universities across the country had people teaching APE courses without a PhD focused in APE. Also, courses only meet, on average, for 16 weeks, for three hours a week (Piletic & Davis, 2010). Similar research done by Ayers and Housner (2008) found that less than 20% of pre-service physical educators have an APE specific course offered to them in their undergraduate studies. However, as higher numbers of students with disabilities are included in general PE classes, it is becoming more apparent that pre-service physical education teachers must become more educated on the topic of adapted physical education. Previous research done by Hodge and Elliott (2013) showed that the majority of teaching majors who took part in their study said they would feel more confident teaching students with disabilities if they had better preparation during their course load in school.

Benefits of Online Education

The shortcomings of current training in APE received by pre-service physical educators, may be addressed by the use of online education. Online education has the potential to give the learner access to experts and resources otherwise unavailable (Dede,

Jass Ketelhut, Whitehouse, Breit, & McCloskey, 2008). Online education has become a

promising option for helping to educate pre-service teachers on many different subjects.

For example, research (Kennedy & Thomas, 2012) has examined how pre-service teacher

candidates learned about Positive Behavioral Interventions and Supports (PBIS) using

online content acquisition podcasts (short audio and visual podcasts). The students who

learned through content acquisition podcasts outperformed their classmates who learned

through text-based education on knowledge retention scores (Kennedy & Thomas, 2012).

A study done by Kennedy, Wagner, Stegall, Lembke, Miciak, Alves, Brown, Driver and

Hirsch (2015) found that pre-service teachers who received an online educational course

in the form of Content Acquisition Podcasts about curriculum-based measurement

improved significantly in knowledge and application measures compared to students who

received text-only education. Additionally, another study was done that focused on online

education vs. text-only education on the topic of special education. This study found that

pre-service teachers who received the Content Acquisition Podcast answered more

knowledge retention questions correctly compared to their peers who learned with text-

only (Kennedy, Thomas, Aronin, Newton & Lloyd, 2014). With these promising studies

showing the success of online education for multiple subjects, research needs to be done

for a further range of subjects, such as GPE and APE.

Research on online education for the pre-preparation of physical educators is

currently sparse. One study examined how comfortable pre-service teachers felt to teach

health and physical education after taking courses only online. The researchers

concluded that the pre-service teachers felt ready and confident to teach health and PE in

a class setting, as demonstrated by written responses to open-ended questions, aimed at finding their perceived readiness and competency (McMahon & Thompson, 2014). Notably though, researchers did not assess actual learning of the pre-service physical educators. Additional research on the effectiveness of online education to provide physical educators with evidence-based strategies to include children with disabilities is warranted.

<div align="center">Peer Tutoring: an Evidence-Based Strategy</div>

Peer tutoring is an evidence-based teaching strategy that enables students with disabilities to receive help and guidance from their peers in a classroom setting (Qi & Ha, 2010). These peer tutors must receive training, usually consisting of multiple training sessions to make sure that the peer tutors have mastered knowledge and skills that they need to be effective tutors (Ward & Ayvazo, 2006). It is important that peer tutors receive training in order to know exactly what they must convey to their peer who experiences a disability. In a study done by van der Mars, McCubbin, Houston-Wilson and Dunn (1997), peer tutors were specifically trained to use proper cueing, feedback, and task analysis of specific motor skills. In the same study, students with disabilities who worked with a peer tutor showed vast improvements in their motor skills compared to their baseline assessment without a trained peer tutor. Furthermore, research done by Klavina and Block (2008) found that trained peer tutors helped students with disabilities improve on their baseline activity-engagement time and their number of positive peer interactions. The same study also found that both students with and without disabilities engaged in

more learning time during class while involved with peer tutoring. The same research also found that students with severe and multiple disabilities (SMD) also responded more sociably to peer instruction during activity than they did to adult instruction. These findings show that peer tutoring can be an effective way of helping students with disabilities learn in the least restrictive environment.

Purpose of the Study

The purpose of this study is to examine how online education effects knowledge retention for pre-service teachers on the subject of peer tutoring, when compared to text-based learning.

METHODOLOGY

Study Design and Participant Recruitment

The study utilized a two-arm randomized trial to evaluate the effectiveness of an online course (Peer Tutoring in Physical Education) to increase knowledge about peer tutoring, relative to a control condition who will receive the same information via a text-based format. Undergraduate students majoring in physical education were recruited to participate in the study. These students were enrolled in one of three undergraduate kinesiology pedagogy classes during the Spring 2017 semester. Students were provided with an information sheet that provided details about the study, and were asked to sign a consent form if they wanted to participate. All interested students then completed a knowledge test on the topic of peer tutoring. The test was originally created, validated, and used by Healy, Block, & Kelly (2015). The questionnaire contains 18 questions related to peer tutoring, and includes multiple choice and open-ended questions. A rubric, validated by experts (Healy, Block, & Kelly, 2015), was used for open-ended questions. Demographic information (gender and class level) was also collected at baseline. Participants were assigned to an experimental or control condition based on the class they were enrolled in at the time of the intervention. The participants in the experimental group were emailed a web address that directed them to the online course (Peer Tutoring in Physical Education). The participants in the control group were emailed a link to the text-based version of Peer Tutoring in Physical Education. Both groups were instructed that they had 1 week to complete the learning material. After this period, participants,

once again, completed the knowledge test (post-test). Students who completed over 75%

of the online course, or who downloaded the text-based learning materials, and completed

pre and post measures, were included in the data analysis.

The Online Course: Peer Tutoring in Physical Education

The experimental group will complete a short online course (the treatment), titled

Peer Tutoring in Physical Education. The online course utilizes podcasts (with visuals

and voiceover). The podcasts are short (approximately 4 minutes) and each one focuses

on a specific topic related to peer tutoring in physical education. In the course, there are

seventeen total podcasts. The podcasts are separated into three main sections:

Preparation, Training, and Implementing the Program. The Preparation and Training

sections have four quizzes each, with the number of questions in each quiz ranging from

one to four. Each podcast is designed using the framework of Mayer's Principles. The ten

principles are listed as follows: coherence principle, signaling principle, redundancy

principle, spatial contiguity principle, temporal contiguity principle, modality principle,

segmenting principle, pre-training principle, multimedia principle, and personalization,

voice and image principles. The research-based principles focus on making content as

easy to receive as possible, while cutting out any unnecessary text that would overload

the learner. The use of visuals is stressed to aid in learning, and should be used as a direct

link to the text and audio being presented.

Text-based Learning Material Creation

The control group will receive text-based learning materials. The text-based booklet was created directly from the information in the scripts from the online course. The quizzes in the booklet assess the exact same information that the online course does, without the automatic feedback that can be found in the online course. The booklet contains pertinent visuals that are imperative for students to have access to the same content that the online group will have.

Statistical Analysis

Descriptive statistics (i.e., means, standard deviations, frequency counts) will be used to understand the participants' demographic characteristics (for example, gender and class level) and condition equivalence will be established using a T-test for continuous variables. Baseline follow-up data will be analyzed using an independent T-test. Statistical significance will be set at $p = 0.05$. When significant differences are found, multiple comparisons will be performed using the post hoc Tukey test.

RESULTS

31 participants completed the pre-test and post-test while receiving either the online course or paper booklet to learn about tutoring. Of those students, 21 received the online course, while the other 10 learned through the paper booklet. The participants consisted of 21 female students and 10 male students. Students in this study were compiled from three different class levels: three sophomore, nine juniors, and nineteen seniors.
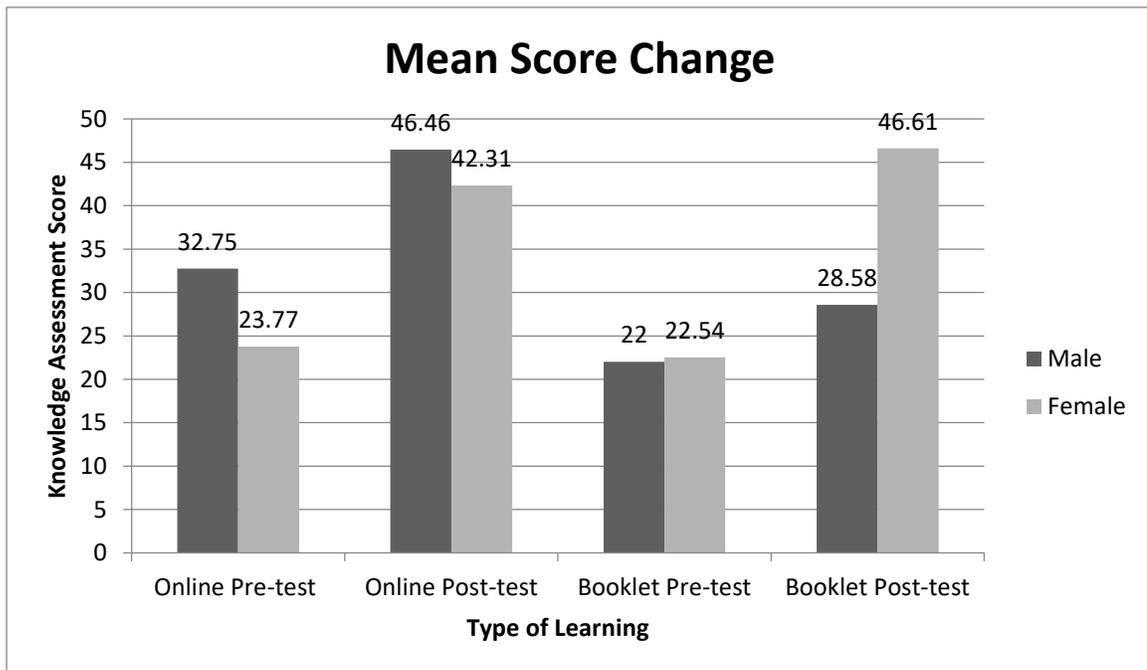
Mean Score Change

Figure 1. Mean Score Change for Males and Females. Refer to table 1 for graph data.

Table 1. Mean Scores and Standard Deviations

Source	Knowledge Pre-Test	Knowledge Post-Test
Online Course (N=21)	26.72 (9.33)	22.37 (8.76)
Male (n=7)	32.75 (9.59)	22.00 (7.54)
Female (n=14)	23.77 (7.92)	22.54 (9.80)
Text-based (N=10)	43.69 (12.70)	41.20 (18.10)
Male (n=3)	46.46 (10.47)	28.58 (18.88)
Female (n=7)	42.31 (13.84)	46.61 (16.09)

Two statistical analyses were used to test assumptions of the sample used for the study. Homogeneity of variance was tested using Levene's statistic, finding no violation in the variance of the sample (p>.05). The Kolomogrov-Smirnov test was used to test for normality, and there was no violation of normality (p>.05).The results of this study found changes in scores between pre-test and post-test for gender in the control group and the experimental group, although they were not significant. An Independent T-test was run using SPSS, and the following results can be found in Table 1. The analysis found that females in the paper booklet group had an increase in scores from pre-test (M=22.54, SD=9.80) to post-test (M=46.61, SD=16.09). Females in the online group also had an increase in scores from pre-test (23.77, 7.92) to post-test (M=43.21, SD=13.84). The males in the sample also saw their scores change, with the males in the paper booklet group having their scores rise from pre-test (M=22.00, SD=7.55) to post-test (M=28.58,

SD=18.88). The males in the online group showed an increase in scores from pre-test

(M=32.75, SD=9.59) to post-test (M=46.46, SD=10.47). A manipulation check was done

for the pre-test scores between the experimental and control groups, and no significant

difference was found (p=.223). A follow up test was run at the post-test for the two

groups again, finding no significant difference in mean score (p=.660).

DISCUSSION

Results from the current investigation found no significant differences in knowledge of peer tutoring between those who learned online versus those who learned traditionally through the paper booklet. Although this study looked to determine the effectiveness of online education for teaching about peer tutoring, it found that traditional education may also be an effective way of transmitting important information to pre-service teachers. Previous research has shown that methodological and situational factors impact the effectiveness of online interventions (Bullen, 2007; Murray, Khadjesari, White, Kalaitazi, Godfrey, McCambridge & Wallace, 2009). Methodological factors such as the length of the intervention, content being presented, expertise of the individuals delivering the intervention, and the type of intervention delivery system are identified as important variables when delivering an intervention (Volery & Lord, 2000; Selim, 2007). The ideal time length for information to be presented and assessed is anywhere from 8-16 weeks, or the length of a half or full semester (Shaw, Chametzky, & Burrus, 2013). However, in the present study, participants were only given one week to learn about the information related to peer tutoring. Perhaps a longer period of time to learn the information both online through podcasts and in the text-based form would have yielded different results.

Mayer (2002) states that there are very specific principles that podcast and other multimedia platforms must follow when presenting information. These principles focus on how text and visuals, and audio should be presented so that students can make

connections with and between pieces of information that will lead to retention of the desired information. Previous research that utilized Mayer's principles when designing podcast interventions proved to be successful. This research showed that in the participants who received the podcast interventions that were created using Mayer's principles scored significantly higher than their peers in the control group who learned from text-only (Kennedy et all, 2012; Kennedy et. all, 2016). In these studies, specific principles such as the redundancy principle and the personalization principle were correctly utilized to present important information to students. The redundancy principle states that individuals learn better when information is presented with audio and visuals at the same time, while leaving out text. The personalization principle refers to the fact that individuals will learn better when information is stated in a more conversational manner, rather than in a formal manner (Mayer, 2002). The present study may have benefitted from using less information per slide while being more conversational in the delivery of important information. If the delivery of information is not controlled to work together in ways that aid knowledge retention, then it may be harder for students to learn the desired information.

Although Meyer's principles have been researched as a way to outline how a successful podcast course should be planned, there has been recent research that has not been able to find the effectiveness of podcast education that utilizes Mayer's principles compared to more traditional types of education. A recent study found that when educating pre-service teachers about technology, there was no significant difference in

achievement scores between the group who learned through podcasts that followed

Mayer's principles and the control group who learned from traditional lecturing

(O'Bannon, Lubke, Beard & Britt, 2011). Similar research also found that there was no

significant difference between the a podcast learning group and a text- based learning

group for participants who were being educated about nursing (Vogt, Schaffner, Ribar &

Chavez, 2009) . There are many factors that could lead to not finding significant

difference in achievement between the two groups in both sets of research. However,

reviewing Mayer's principles and re-structuring the podcasts to become more in-line with

the important principles may lead to more success for the podcast learning group. The

same idea could apply to the current study which may have benefitted from a possible re-

structuring of certain, specific aspects of the podcasts according to Mayer's principles to

transmit clear, accessible information about peer tutoring.

In the current study, the ultimate focus of peer tutoring was broken down into

three sections: preparation, training, and implementing the peer tutoring program. These

three sections were focused on because they have been shown to be extremely important

to the performance of a peer tutoring program (Greenwood, Terry, Arraega-Mayer &

Finney, 1992; Kamps, Barbetta, Leonard & Delquadri, 1994). The information presented

in the current study both in the online group and the text-only group was presented so that

the participants could have an overall understanding of how to prepare a peer-tutoring

program starting from the planning portion and ending in how to implement the program

in their own teaching experiences. Although there has not been expansive research done

that focuses on how pre-service teachers best learn how to implement peer tutoring in physical education, this current research found that students improved their knowledge of peer tutoring from pre-test to post-test in both the online group and the text-only group. Because peer tutoring is an evidence-based practice that can aid in teaching students with disabilities in an educational setting, more research should be done that finds the most effective strategies to teach pre-service educators how to best implement effective peer tutoring programs.

Online education has many benefits that make it an attractive option for educators and students at the college level. Offering courses online is a cost effective way of delivering information to students. Because many students have access to a computer in their home, students are able to save money on travel to school, and universities can save on costs to operate classrooms (Li & Irby, 2008). Another benefit of online education is that it has the ability to motivate students to learn desired information. Bulliger, Supanakorn and Boggs (2010) found that students were motivated to learn when podcasts were used to present information in their online class. Students also generally have a positive attitude about having information presented online from a distance (Sandoozi, 2000). These reasons for using online education continue to make it a viable option for educating pre-service teachers in a university setting when compared to traditional, text-based education. The current study was effective in these ways because it made the information easy to access for the students in the online podcast group, and it was also a

cost-effective way to transmit important information to students in a simulated distance-learning situation.

This study had some limitations that should be considered for future research. First, there was not a follow-up knowledge assessment administered after the post-test was taken by the participants. Thus, it was not able to be seen if the participants from the experimental and control groups retained the information in the time after the post-test. Also, this study focused only on assessing knowledge of the participants involved. Although having knowledge about peer tutoring is important, it would be beneficial for future research to be able to assess the application of skills learned through the online course and the paper booklet. Assessing the application of the skills would show a deeper understanding and retention of the information than only assessing the knowledge of peer tutoring. Participants were only given one week to learn the desired information, as noted earlier. This time period should be stretched out so that future participants can have more time to process important material. A final limitation of this study is that participants were recruited using non-random sampling. To improve generalizability for future research, samples should be chosen from larger populations.

REFERENCES

Block, M. E., & Obrusnikova, I. (2007). Inclusion in physical education: A review of the literature from 1995–2005. Adapted Physical Activity Quarterly, 24, 103–124.

Bolliger, D. U., Supanakorn, S., & Boggs, C. (2010). Impact of podcasting on student motivation in the online learning environment. *Computers & Education, 55*(2), 714-722. doi:http://dx.doi.org/10.1016/j.compedu.2010.03.004

Bowman-Perrott, L., Davis, H., Vannest, K., Williams, L., Greenwood, C., & Parker, R. (2013). Academic benefits of peer tutoring: A meta-analytic review of single-case research. *School Psychology Review*, *42*(1), 39.

Bullen, M. (2007). Participation and critical thinking in online university distance education. *International Journal of E-Learning & Distance Education*, *13*(2), 1-32.

Cervantes, C. M., Lieberman, L. J., Magnesio, B., & Wood, J. (2013). Peer Tutoring. *JOPERD: The Journal of Physical Education, Recreation & Dance*, *84*(3), 43-48.

Crawford, S., O'Reilly, R., & Flanagan, N. (2012). Examining current provision, practice and experience of initial teacher training providers in Ireland preparing pre-service teachers for the inclusion of students with special education needs in physical education classes. *European Journal of Adapted Physical Activity*, *5*(2), 23-44.

d'Arripe-Longueville, F., Gernigon, C., Huet, M., Cadopi, M., & Winnykamen, F. (2002). Peer tutoring in a physical education setting: Influence of tutor skill level on novice learners' motivation and performance. *Journal of Teaching in Physical Education*, *22*(1), 105.

de Oliveira Neto, J. D., Huang, W. D., & de Azevedo Melli, N. C. (2015). Online learning: Audio or text?. *Educational Technology Research and Development*, *63*(4), 555-573.

Greenwood, C. R., Terry, B., Arreaga-Mayer, C., & Finney, R. (1992). The classwide peer tutoring program: Implementation factors moderating students' achievement. *Journal of Applied Behavior Analysis*, *25*(1), 101-116.

Healy, S. (2015). The Impact of Online Professional Development on Physical Educators' Knowledge and Implementation of Peer Tutoring. (Unpublished Doctoral Dissertation). University of Virginia, Charlottesville, VA.

Hodge, S. R., & Elliott, G. (2013). Physical education majors' judgments about inclusion and teaching students with disabilities. *Journal of Education and Training Studies*, *1*(1), 151-157.

Kamps, D. M., Barbetta, P. M., Leonard, B. R., & Delquadri, J. (1994). Classwide peer tutoring: An integration strategy to improve reading skills and promote peer interactions among students with autism and general education peers. *Journal of Applied Behavior Analysis*, *27*(1), 49-61.

Kennedy, M. J., Ely, E., Thomas, C. N., Pullen, P. C., Newton, J. R., Ashworth, K., Cole, M.T. & Lovelace, S. P. (2012). Using multimedia tools to support teacher candidates' learning. *Teacher Education and Special Education*, *35*(3), 243-257.

Kennedy, M. J., & Thomas, C. N. (2012). Effects of content acquisition podcasts to develop preservice teachers' knowledge of positive behavioral interventions and supports. *Exceptionality*, *20*(1), 1-19.

Kennedy, M. J., Thomas, C. N., Aronin, S., Newton, J. R., & Lloyd, J. W. (2014). Improving teacher candidate knowledge using content acquisition podcasts. *Computers and Education*, *70*, 116-127

Kennedy, M. J., Wagner, D., Stegall, J., Lembke, E., Miciak, J., Alves, K. D., Brown, T., Driver, M. K. & Hirsch, S. E. (2015). Using content acquisition podcasts to improve teacher candidate knowledge of Curriculum-Based Measurement. *Exceptional Children, 82*(3), 303-320. 0014402915615885.

Klavina, A., & Block, M. E. (2008). The effect of peer tutoring on interaction behaviors in inclusive physical education. *Adapted Physical Activity Quarterly*, *25*(2), 132-158.

Klavina, A., & Rodionova, K. (2015). The effect of peer tutoring in physical education for middle school students with severe disabilities. *European Journal of Adapted Physical Activity*, *8*(2), 3-17.

Li, C., & Irby, B. (2008). An overview of online education: Attractiveness, benefits, challenges, concerns and recommendations. *College Student Journal*, *42*(2), 449-458.

Mangope, B., Mannathoko, M. C., & Kuyini, A. B. (2013). Pre-service physical education teachers and inclusive education: Attitudes, concerns and perceived skill needs. *International Journal of Special Education*, *28*(3), 82-92.

Mayer, R. E. (2002). Multimedia learning. *Psychology of Learning and Motivation*, *41*, 85-139.

McMahon, J. A., & Thompson, M. D. (2014). Health and physical education and the online tertiary environment at two universities: Pre-service teachers' perceived "readiness" to teach HPE. *Australian Journal Of Teacher Education*, *39*(3),

Murray, E., Khadjesari, Z., White, I. R., Kalaitzaki, E., Godfrey, C., McCambridge, J., & Wallace, P. (2009). Methodological challenges in online trials. *Journal of Medical Internet Research*, *11*(2).

O'Bannon, B. W., Lubke, J. K., Beard, J. L., & Britt, V. G. (2011). Using podcasts to replace lecture: Effects on student achievement. *Computers and Education*, *57*(3), 1885-1892.

Piletic, C. K., & Davis, R. (2010). A profile of the introduction to adapted physical education course within undergraduate physical education teacher education

programs. *The ICHPER-SD Journal of Research in Health, Physical Education, Recreation, Sport and Dance*, *5*(2), 26.

Place, K., & Hodge, S. R. (2001). Social inclusion of students with physical disabilities in general physical education: A behavioral analysis. *Adapted Physical Activity Quarterly*, *18*(4), 389-404.

Shaw, M., Chametzky, B., Burrus, S. W., & Walters, K. J. (2013). An evaluation of student outcomes by course duration in online higher education. *Online Journal of Distance Learning Administration*, *16*(4).

Selim, H. M. (2007). Critical success factors for e-learning acceptance: Confirmatory factor models. *Computers and Education*, *49*(2), 396-413.

Sondoozi, T. (2000). *A comparison of the effectiveness of on-line teaching versus traditional teaching methods in higher education: A critical review* (Order No. 9991642). Available from ProQuest Dissertations & Theses Global: The Humanities and Social Sciences Collection. (304631637).

U.S. Department of Education. (2003). Twenty–fifth annual report to Congress on the implementation of the Individuals with Disabilities Education Act. Washington, DC: Author.

van der Mars, H., McCubbin, J., Houston-Wlison, C., & Dunn, J.M. (1997). The effect of peer tutors on motor performance in integrated physical education classes. *Adapted Physical Activity Quarterly*, *14*, 298-313.

Vogt, M., Schaffner, B., Ribar, A. & Chavez, R. (2009). The impact of podcasting on the

    learning and satisfaction of undergraduate nursing students. *Nurse Education in*

    Practice. 10(1), 38-42. https://doi.org/10.1016/j.nepr.2009.03.006

Volery, T., & Lord, D. (2000). Critical success factors in online education. *International*

    Journal of Educational Management, *14*(5), 216-223.

Ward, P., & Ayvazo, S. (2006). Classwide peer tutoring in physical education: Assessing

    its effects with kindergartners with autism. *Adapted Physical Activity*

    Quarterly, *23*(3), 233.