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Original Research

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Podcast Implementation in an Entry-Level Doctor of Physical Therapy First-Semester Course: Student Perceptions and Impact on Academic Performance

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Abstract

Podcasts have increased in popularity in the last decade, but description of their use in academic settings is lacking. The purposes of this study were to (1) investigate the difference in student performance on course examinations based on podcast usage and satisfaction and (2) examine the perceptions of educational benefits, usage preferences, and accessibility of podcasts in a clinical examination course in a hybrid Doctor of Physical Therapy (DPT) curriculum. This was a mixed-methods study that utilized a retrospective non-experimental correlational design, and data were collected and analyzed via self-report survey. Participants adopted five podcasts into learning and studying activities. An ANOVA indicated that there was a statistically significant (p = .01) difference in examination performance for podcast usage in the fourth episode, with those who listened more performing better. Level of agreement in podcast satisfaction had little impact on academic performance on examinations. A total of six themes emerged from qualitative analysis: podcasts provided listeners a supplementary study tool, connected the learner to the real world, and allowed convenient listening and multitasking. Listeners noted the experience could be enhanced by an improved streaming platform, preferred shorter-duration podcasts, and recommended podcasts to future cohorts. In a sample of 27 first-year hybrid DPT participants, 100% reported overall satisfaction with podcast content and would recommend them to future cohorts.

Keywords: *educational podcasts, doctor of physical therapy, distance learning, academic performance, perceptions, mixed methods*

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Introduction

Utilization of podcasts has grown in popularity over the years, especially in education. Podcasts are defined as a form of technology that distributes sound or video to individuals (Robson, 2010), but they are typically similar to radio talk shows, in which the main form of media usage is sound distribution. Podcasts are distinguished from other forms of audio-video content, in that they are typically part of a series to which people can subscribe. Podcasts are easily available on mobile devices, increasing accessibility for the listener (Johnson, 2006; Khechine, 2013). An attractive feature of podcasts is that they allow the listener to take a break from excessive visual input from computer screens or textbooks, as well as potentially allowing auditory input to occur while dual-tasking. This is especially convenient for individuals with busy schedules, as it allows knowledge and information to be accessible on the go. Podcasts became popular in the early 2000's through the advancement of the Internet and were historically referred to as audiographs, webcasts, vodcasts, and the now more common mainstream term podcasts (Kay, 2012; Loomes, 2002). Presently, they are widely used to share information, stories, and knowledge on a tremendous variety of topics.

Literature Review

When used in academic settings, podcasts are just one of many resources that fall into the category of electronic learning or "e-learning." E-learning is defined as education based on communication through electronic networks, including computers and smartphones, audio-visual materials, search engines, and electronic libraries (Kumar Basak, 2018). There has been an increase in the amount of research supporting the use of e-learning education for individuals pursuing a degree in a medical profession (Cho, 2017). Over the past 20 years, licensed healthcare professionals have been utilizing podcasts for continuing education purposes as well (Greenberger, 2015; Riddell 2017). For example, physicians have been utilizing medical podcasts in place of textbooks and journals, due to their ease of access and convenience (Kelly, 2022). As podcasts are typically released in a series and at scheduled times, learners can access new information quickly, rather than waiting for new publications. As healthcare is constantly evolving, educational podcasts allow healthcare workers to access new information relevant to their fields regularly (Cho, 2017).

With the start of the COVID-19 pandemic, educators could no longer utilize traditional face-to-face lectures, due to restrictions on large gatherings (Barnes, 2021). New forms of educational media, including podcasts, are now increasing in popularity to replace traditional lectures, so students can learn from a distance (Bashir 2021; Kaplan, 2020). In the past decade, students have been seeking the most accessible resources that will provide education on the go, and the COVID-19 pandemic accelerated the process (Bashir, 2021), especially with the emergence of more online or hybrid graduate programs in allied health and medicine. When comparing satisfaction and performance in two physical therapy (PT) student cohorts, with one cohort given the course material via face-to-face lectures and the other given material via online learning resources, performance in online learning was found to be statistically higher (Rossettini, 2021). Satisfaction and performance were higher in the online learning group. The online learning materials included PowerPoint presentations, asynchronous recorded lectures, and additional resources, such as podcasts, given via email communication (Rossettini, 2021).

A recent study found that the use of educational podcasts has increased over the years, and they are now being included in certain academic curricula (Kelly, 2022). Podcasts have been quickly adopted into health profession education because they provide learners with rapid access to information on their own terms. Podcasts up to 30 minutes in length adhere to the average adult attention span and allow students to access critical details quickly, which is helpful during review before an exam, when students feel short on time (Back, 2017; Briand, 2021; Cho, 2017; Cooper, 2017; Prakash, 2017; Robson, 2010). Despite their short duration, podcasts can be robust and include storytelling of real-life patient encounters, interviews with other clinicians,

and clinical reasoning discussions, thus further enhancing students' learning experience (Kaplan, 2020; Minter, 2021; Riddell, 2021).

Educational technology has advanced in recent years, allowing the physical therapy profession to use pedagogical approaches that are online-based to teach core physical therapy skills to doctor of physical therapy (DPT) students. The popular media chosen in previous literature was audio-video lectures, which allowed for demonstration of the skill (Ng, 2021). In those studies, most students who utilized the video lectures improved their performance on practical exams and felt the resource was valuable for studying and practicing their skills (Allen Moore, 2012; Greenberger, 2015). Previous research supports podcasts with both an audio and video component showing improvements in skill acquisition and academic performance in PT students (Ng, 2021). Despite the growing popularity and support of podcasts, however, the evidence is still emerging, and there is little information available on the integration of podcasts, especially in DPT education. Due to a lack of robust literature on the topic, there is a gap in determining whether audio-only podcasts are beneficial for learning, play a part in academic performance, or are preferred by students over other methods.

Purpose of the Study

The purposes of this study were (1) to investigate the difference in student performance on course examinations based on podcast usage and satisfaction and (2) to examine perceptions regarding educational benefits, usage preferences, and accessibility of podcasts in a clinical examination course in a DPT curriculum. The research hypothesis was that those who listened to the podcasts more and had higher satisfaction with podcasts would perform better on corresponding examinations across the course.

Methods

This study employed a convergent, non-experimental mixed-methods design, with both quantitative and qualitative data collected through self-report surveys. Institutional Board Review (IRB) approval was obtained. The self-report satisfaction survey utilized closed and open-ended questions covering different dimensions related to podcast use and was administered at the end of the first academic semester of a hybrid DPT cohort. Examination grades (three in total) were obtained from the course in which the podcasts were implemented following the completion of the first semester. Using Mayer's Cognitive Theory of Multimedia Learning (Mayer, 2014), the authors designed course content that had visual and auditory components. This theory states that deeper learning can occur when information is presented in both auditory and/or visual channels as opposed to text alone. Recorded micro-lectures delivered modular content with definitions and examples, and five audio podcasts with episode objectives were created to enhance application of content in the specific topic areas, incorporating Mayer's Cognitive Theory of Multimedia Learning. The DPT students, in a 5-credit-hour Physical Therapy Examination Skills course imbedded in a 15-credit-hour semester, were provided the content via recordings asynchronously. The series of five podcasts was entitled the *Physio Den*. Each podcast episode contained the same elements: introduction with story time, peaches and pits segment, and pearls of wisdom. Each was hosted by the primary course instructor and incorporated one to two guests who could provide applied context to the topic presented. Elements for the podcast were selected on the basis of the study authors' previous experience and preference of podcast style. Each podcast ranged in length from 35–50 minutes and was uploaded to a social media platform, linked through the available learning management system. Further information regarding the podcast segments and topics is shown in Table 1.

Table 1. *Podcast Topics Included in the Physio Den Examination Course Series*

Episode title/guest(s)	Episode objectives
Episode 1: History and systems review/instructor from the PT department	• Demonstrate a sample history-taking interview. • Review common barriers and facilitators to an effective interview. • Provide examples of possible systems-review findings in a typical musculoskeletal patient example.
Episode 2: Range of motion examination/ upperclassmen DPT students	• Discuss examples of patient findings that relate to end feels, capsular patterns, or range-of-motion restrictions. • Provide techniques to improve reliability of range-of-motion measurement. • Review common areas of difficulty DPT students may encounter while studying or practicing with examples.
Episode 3: Sensory examination/ assistant dean of academic and student affairs (also a DPT)	• Discuss how sensory examination has implications for movement analysis throughout the lifespan. • Review examples of how to interpret sensory patterns of dysfunction. • Provide systematic processes for managing the screening to examination with patient scenarios.
Episode 4: Gait and balance examination/ instructor from the PT department	• Review the common outcome measures for gait and balance, with examples of barriers and opportunities for performing each. • Discuss case scenarios and how a PT may choose to select a gait-and-balance measure and why. • Define the specific constructs of gait and balance captured through different examination techniques.
Episode 5: Outcome measurement/DPT from the community (also director of education for facility)	• Discuss outcome measurement across the continuum of the International Classification of Functioning, Disability, and Health (ICF) model. • Provide examples of outcome measures in each section of the ICF model. • Demonstrate passion and enthusiasm for outcome measurement through discussion, and round-robin practice what measures to select for short scenarios.

Participants

The target population of this study was a convenience sample of 27 first-semester students in a 3-year hybrid model DPT program in a public institution in Texas. From this target population, subject recruitment was based on voluntary completion of the self-report podcast satisfaction survey. Participants in the cohort were recruited via e-mail with information regarding the purpose of the survey. Completion of the survey was anonymous, and each participant entered their own examination grades into the survey submission.

Instrumentation

To develop the self-report satisfaction survey, prior studies (Alarcón, 2020; Robson, 2010) with appropriate instruments were reviewed, ensuring important constructs of podcast satisfaction were included. The Questionnaire for Assessing Education Podcasts (QAEP) captures dimensions including access and use, structure and design, content adequacy and value as an aid to learning (Alarcón, 2020) and has been reported

in a similar sample of first-year students using educational podcasts in a specialized course. The QAEP has been found to have a stable across-group structure, corrected item-factor correlations and corrected item-total correlations values greater than 0.30, and Cronbach's alpha coefficients for scores greater than 0.70, indicating that the survey contains ample psychometric properties (Alarcón, 2020). Constructs about previous podcast usage from the article, "Early Evidence of Educational Podcasts," were used to capture participants' educational and non-educational podcast usage prior to beginning a physical therapy program (Robson, 2010). The self-report survey was created and included student demographic questions that assessed students' age, gender, and numerical values of their examination grades completed in the course. The survey also consisted of two multiple-choice sections, with the first focusing on previous podcast usage, including both educational and non-educational podcasts, and the second probing the students' perception of the podcasts. The measurement constructs included questions regarding accessibility, learning style, podcast segment preference, educational benefit, and podcast organization; these were measured using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The final section of the survey included three open-ended response questions that assessed student perceptions of podcast benefits, how podcasts could be improved, and whether students would recommend podcasts to future students.

Data Collection

The survey was initially distributed to DPT faculty and third-year DPT students to be piloted and reviewed. Feedback was received from 15 respondents and was incorporated to improve the functionality of the survey on the Microsoft Forms platform. The average time of taking the survey was 17 minutes in the pilot phase. The final survey link was then emailed to the target sample and responses were collected prior to the start of the next semester. The participants completed the survey after completing all coursework related to listening to the podcasts and taking their course examinations. Data were entered into the survey anonymously.

Data Analysis

Descriptive statistics were performed for reporting demographic characteristics of the sample, examination scores, and podcast usage prior to and during the course. Data were exported from Microsoft Forms into Microsoft Excel (2016) and imported to IBM SPSS Statistics (Version 27) for analysis. Paired-sample *t*-tests were used to assess differences in examination scores and podcast usage prior to and during the course. A between-groups one-way analysis of variance (ANOVA) was performed to assess the difference in number of podcast listens to examination performance. Mann-Whitney *U* tests were used to assess the differences in examination performance and perceptions of accessibility, learning styles, podcast segments, educational benefit, and podcast organization. Items on the survey were divided into level of agreement by agree/strongly agree and disagree/strongly disagree to present medians and frequency of agreement for ease of interpretation. A $P < .05$ was determined for tests of statistical significance.

Thematic analysis was used to review the central concepts of each open-ended response. Braun and Clarke's six-phase thematic analysis was followed (Braun & Clarke, 2006). The initial coding process was separated into two cycles. In the first cycle, reviewers AR and JA individually coded each response, capturing the semantic and conceptual meaning of the data (Braun & Clarke, 2006). The reviewers coded each line of responses for a total of 36 codes combined. In the second cycle of coding, the responses were reviewed again by AR and JA, where the codes were then compared to determine the best-fitting code per response. Themes were determined by identifying the overall coherent and meaningful pattern in the data relevant to the research question (Braun & Clarke, 2006). This process was performed for each free-response question, resulting in a total of six constructed themes for three questions. The codes and themes were then assessed and reviewed by the lead author (MF), with agreement achieved for all themes.

Results

A total of 27 out of 28 total possible respondents participated in this study, for a 96.4% participation rate. The distribution of sex was 10 males and 17 females, with a mean age of 25.77 years old (seven participants were older than the mean). Of these participants, 37% reported no prior utilization of podcasts prior to this course in either personal or professional settings, and 63% reported some previous use of podcasts. During the fall semester, 55.6% of participants reported utilizing podcasts outside of the course at least one to three times per week, and 3.7% reported utilizing podcasts four to six times per week. There was no difference between usage of podcasts prior to and during the course (p = .256); participation remained similar. Podcast episodes one and four acquired the most listens, with 37 listens, while episode three acquired 36 listens, and episodes two and five acquired 30 listens over the span of the first semester. Most participants listened to each podcast once, with 10 total instances of participants reporting not listening to a particular episode, and 35 total instances of participants listening to a particular episode more than once. Episode three was the only episode to which every participant listened at least once. Descriptive statistics related to the course examination scores are presented in Table 2. Paired-samples *t*-tests showed no difference in performance on examinations during the course.

Table 2. *Course Examination Performance of the Sample*

	Range	Mean	Standard deviation	Paired-samples *t*-test
Exam 1	72-102%	87.55	8.72	
Exam 2	53-102%	85.11	11.90	
Exam 3	70-101%	86.60	8.32	
Exam 1 and 2				p = .217
Exam 1 and 3				p = .589
Exam 2 and 3				p = .466

A one-way between-groups ANOVA was conducted to explore the impact of podcast usage on examination performance, and the results can be found in Table 3.

Table 3. *Comparing Examination Performance Based on Podcast Usage With One-Way ANOVA*

Variables	*df*	*F*	*p*	Partial eta squared
Exam 1 and podcast 1	3, 23	.612	.614	
Exam 1 and podcast 2	2, 24	.455	.640	
Exam 2 and podcast 2	3, 23	2.178	.118	
Exam 3 and podcast 3	2, 24	.531	.595	
Exam 3 and podcast 4	2, 24	5.347	.012*	.31
Exam 3 and podcast 5	2, 24	.418	.663	

Note: *p < .05, demonstrating statistical significance

Participants were divided into three groups according to their podcast usage for each episode (Group 1: zero listens, Group 2: one listen, Group 3: two or more listens). Each episode was compared to the examination that covered the content of the podcast (examination one covered podcast episodes one and two; examination two covered podcast episode two; examination three covered podcast episodes three, four, and five). There was no statistically significant difference at the p <0.05 level in examination performance for podcast usage in

episodes one, two, three or five. There was a statistically significant difference at the p <0.05 level in examination performance for podcast usage in episode four, with those listening more performing better: F (2, 24) = 5.35, p = .01. The effect size, calculated using eta squared, was .31. Post hoc comparisons using the Tukey HSD indicated that the mean score for those who did not listen or listened one time was significantly lower than for those who listened more than one time.

Mann-Whitney U tests were used to determine if the level of agreement on Likert survey item constructs of accessibility, learning style, podcast segment preference, educational benefit, or podcast organization revealed any differences in exam performance throughout the review period. Most items had a majority percentage of agreement with a median score > 3.0, with some constructs being neutral (2.0). Three items had a median score in the disagreement level, including preferring podcasts of longer duration, feeling podcasts were superior to lecture content, and listening to the podcast prior to studying. Table 4 depicts the results of each survey item and presents the findings of the non-parametric test of differences.

Table 4: *Median Scores and Percent Agreement of Survey Items With Analysis of Differences in Agreement and Examination Performance*

Survey item	Median score+	% Agree-ment	Exam 1*	Exam 2*	Exam 3*
The podcasts were easy to access.	4.00	96.3	.444	.519	.741
I believe the content of the podcast was well organized.	4.00	92.6	1.00	.068	.279
Audio podcasts are a good additional resource.	3.00	92.6	.319	.889	.821
I would prefer to listen in my car.	2.00	48.1	1.00	.830	.038^
I would prefer to listen while on campus.	2.00	11.1	.635	.635	.856
I would prefer to listen while at home.	3.00	63	.749	.309	.443
I preferred the shorter-duration (20–30 min) podcasts.	3.00	77.8	.977	.755	.670
I preferred the longer-duration (>30 min) podcasts.	1.00	22.2	.712	.216	1.00
I listened to the podcasts while completing other tasks (driving, chores, exercise, etc.).	3.00	70.4	.238	.307	1.00
I believe I am an auditory learner.	3.00	51.9	.793	.720	.402
I believe I am a visual learner.	3.00	81.5	.257	.099	1.00
I believe I am a kinesthetic learner.	3.00	85.2	.059	.531	.303
I preferred when there were guest speakers on the podcast.	3.00	85.2	.243	.921	.974
I preferred when the guest speakers were student physical therapists.	2.00	40.7	.645	.231	.790
I preferred when the guest speakers were licensed physical pherapists.	3.00	77.8	.441	.798	.289

I found "peaches and pits" beneficial for my learning.	3.00	74.0	.935	.570	.685
I found "story time" beneficial for my learning.	3.00	70.3	.735	.481	.180
I believe that listening to the podcasts was more beneficial to my learning than other study resources (PowerPoint slides, textbook, etc.).	2.00	14.8	.243	1.00	.168
I believe listening to podcasts was more beneficial to my learning compared to recorded video and audio lectures.	1.00	0	.645	.784	.935
The podcasts made it easy to learn about the subject.	3.00	74.1	.008^	.314	.341
I believe the podcast motivated me to learn more about the subject.	3.00	51.9	.185	.616	.793
I have learned new information from listening to podcasts, that I otherwise would not know.	3.00	85.2	.272	.767	.718
The podcasts have made a positive impact on my academic performance.	3.00	59.3	.716	.272	.790
I believe that podcasts have positively affected my exam scores.	2.00	44.4	.373	2.77	.683
I believe podcasts should be implemented throughout the curriculum.	3.00	51.9	.616	.488	.402
I enjoyed listening to the educational podcast compared to recorded video and audio lectures.	2.00	25.9	.498	.893	.370
I preferred to listen to each podcast prior to studying that material.	1.00	18.5	.832	.976	.832
I preferred to listen to each podcast after I had studied all the material.	3.00	66.7	.118	.527	.403
I would prefer podcasts that summarize the information.	3.00	66.7	.561	.433	.348
I would prefer podcasts that apply the information with examples.	3.00	96.3	1.00	.519	1.00
I preferred to listen to the podcasts to review material that I had already studied only.	2.00	51.9	.785	.365	.547

Note: +Color denotes level of agreement, green being agree/strongly agree, red being disagree/strongly disagree, yellow being neutral.

*Mann-Whitney *U* nonparametric tests performed to assess level of agreement (agree/disagree) with each exam score

^$p < .05$ demonstrating statistical significance

For the most part, there was no statistically significant difference in performance on examinations based on the level of agreement on survey items, except that those who disagreed with, "I prefer to listen in my car," performed better on examination three ($p = .038$) and those who agreed with, "The podcasts made it easy to learn about the subject," performed better on examination one ($p = .008$).

The qualitative portion of the study received a total of 81 responses, with 36 codes derived following the two cycles of coding. These codes were further analyzed and a total of six themes emerged amongst the three open-ended survey responses. Themes for the corresponding survey item questions with supportive quotes are found in Tables 5-7. Further description of the themes follows.

Provided Listeners a Supplementary Study Tool

Respondents felt that the podcasts could not be used as a sole source of information but added value in expanding the objectives or providing context. Some respondents reported that listening to the podcasts helped clarify topics covered in the lecture, thus enhancing their understanding. Many respondents also stated that the podcasts helped them remember the information better, rather than listening to the lecture alone. There was evidence to support the usage of podcasts as a learning activity, as well as a final review toward the end of their studying. This ensured that they were able to apply information and emphasized understanding of certain topics.

Connected the Learner to the Real World

Many respondents believed that the story time portions of the podcasts were extremely helpful, as they allowed the learner to understand how topics can be applied in patient care, and they expanded upon the principles provided in other learning activities. One respondent reported that it allowed them to "paint a picture" of the topics, thus deepening their understanding of the topic. The sample valued real-world examples after they had some understanding of the content. Some of the respondents reported that the podcasts could be improved if they included more applied content. Students stated that including more in-depth discussions about clinical cases through summarization of lecture material would be beneficial to their learning experience. Respondents reported that increasing the number of clinical scenarios discussed would allow them to understand how to apply the curriculum content in various ways.

Allowed Convenient Listening and Multitasking

Respondents were varied in demographics and in preferred learning style with technology, but reported appreciating the mode of podcast being auditory, as it allowed them to complete other daily tasks, such as cooking, exercising, or driving while being academically productive. Many respondents appreciated the accessibility and ease of listening to course material at any time, allowing them to feel satisfied with their time management.

Enhance Listening Experience With Improved Streaming Platform

Respondents reported that the podcasts used could have been improved if a better streaming platform were utilized to access them. Functionality of the streaming platform may have impacted the ability to pause, rewind, or go back to specific time points in the podcast. Although respondents did not feel this impacted the use of the podcasts negatively, it did provide evidence to consider that functionality is an important part of the process of learning from podcasts.

Listeners Prefer Shorter-Duration Podcasts

The podcasts available to the respondents were between 35 to 50 minutes in length, and 18.5% of students reported that they would be more likely to listen to the podcasts if they were shorter in duration. Respondents felt overwhelmed with adding these podcasts to their weekly studying, due to the increased time commitment in addition to course lectures. Since the course had transitioned to micro-lectures, doing the same in breaking up the podcasts may have aided in better adoption of the podcasts.

Listeners Would Recommend Podcasts to Future Cohorts

Every respondent recommended that future DPT cohorts should have access to and listen to podcasts. Students reported that the podcasts would help future students remember and understand topics but also apply content. The respondents felt that there was a positive contribution from the podcasts to their learning experience, and they want more courses in the curriculum to adopt the tool.

Table 5. *Direct Quotes Supporting Themes of Educational Benefits of Podcasts*

Question	Theme	Participant quote
What do you believe are the benefits to educational podcasts?	Provided listeners a supplementary study tool	"The benefits of the … podcasts for my education were that they added additional information, but they were not a core and foundational piece of what I studied in order to do well on the exams."
What do you believe are the benefits to educational podcasts?	Connected the learner to the real world	"The most beneficial aspect of the podcasts to me was hearing the stories and then applying those stories to the material I was studying/test taking."
What do you believe are the benefits to educational podcasts?	Allowed convenient listening and multitasking	"These podcasts are quickly accessible and can be listened to anywhere. It is very much education on the go."

Table 6. *Direct Quotes Supporting Themes Derived From Responses About Improvements*

Question	Theme	Participant quote
How do you feel the podcast in the PT Exam Skills course can be improved?	Enhance listening experience with improved streaming platform.	"I would say it could be improved by being on a different platform that you have the ability to rewind on and listen to more than a few times."
How do you feel the podcast in the PT Exam Skills course can be improved?	Listeners prefer shorter-duration podcasts.	"I think they could be a little shorter. When I'm just listening to something and not also getting visual stimulation, I can start to zone out."

Table 7. *Direct Quotes Supporting Theme of Recommending Podcasts to Future Students*

Question	Theme	Participant quote
Would you recommend future students listen to these podcasts?	Listeners would recommend podcasts to future cohorts.	"I would highly recommend that future students listen to these podcasts to assist in their understanding and studies."

Discussion

Although the use of podcasts is well-reported in healthcare disciplines such as medicine (Cho, 2017; Kelly, 2021), there is a gap in understanding the impacts of adding podcasts to course activities in a DPT curriculum. The authors created these podcasts based on preference and previous experience, due to a lack of research on this topic, so more information is needed for educators to properly employ their own podcasts in their courses. However, this study is one of the first to triangulate quantitative and qualitative data in the assessment of the perceptions and performance of DPT students who participated in a lived experience of

podcasting for educational usage. Past studies have shown that including resources such as podcasts has been beneficial to enhancing students' learning (Cho, 2017; Kelly, 2021; Ng, 2021; Rossettini, 2021).

In this study, participants who listened to the fourth podcast more than once performed significantly better on the third exam than those who reported not listening or only listening once. None of the other examinations showed a difference in performance based on podcast usage. This provides some preliminary evidence on the impact of podcasts on learning outcomes measured by examination performance. Assessment of the fourth podcast demonstrated that this podcast had a faculty member as a guest and most of the podcast used clinical examples of how and when to use specific measures of balance and gait. In the qualitative data, students demonstrated a preference for applied depth in the podcasts to stimulate learning, so this may point to how to best structure podcasts for satisfaction and performance in a DPT curriculum. There was no difference in examination scores throughout the semester, so the nature of the cause of the difference in performance based on podcast listens is worth investigating further. In general, there was a trend in a decreasing number of listens, which could relate to the initial novelty of the podcasts, student time management as the semester progresses, or even the functionality of the podcast streaming platform.

The respondents in this study generally reported favorable perceptions of the accessibility of the podcasts, appreciating organization and preferring shorter-length podcasts. Accessibility has been seen to be of value for students utilizing educational technology (Ng, 2021). Although access was captured in the survey, the function of the streaming platform was seen as a theme in the qualitative data. This is an important consideration for educators to consider: what is the best streaming platform to upload podcasts to? Interestingly, the respondents did prefer to listen at home and liked to do so while multitasking.

Self-reported learning styles did not appear to have an impact on satisfaction or performance in this study, corroborated with other studies, so it does not appear that auditory podcasts solely benefit auditory learners. Previous studies have shown that there is no conclusive evidence indicating improved learning utilizing methods associated with one's self-reported learning style (Newton, 2020). In constructing the podcasts for this study, different regular segments were created, and respondents generally were satisfied with the approach to breaking up the content of the podcast. The only item that showed lower agreement was when there were DPT students as guests on the podcast. The qualitative data showed that the respondents perceived the podcasts as a helpful supplementary resource, especially when rich with examples, which may be lacking when DPT students are guests and they provide more anecdotal student experiences on the topic, without application. The respondents reported high agreement that the podcasts were motivating, made learning easier, and had a positive impact on their experience. However, they did not prefer podcasts over other course materials and did not feel strongly that the podcasts had an impact on their performance in the course. This was mostly corroborated in our data analysis, except that the number of podcast listens did demonstrate a difference in examination performance on one of the examinations.

Integration Into the Current Literature

The themes derived from the qualitative responses provided a more in-depth understanding of students' perceptions of the podcasts. Most respondents agreed that the podcasts should be used as a supplemental resource for reviewing information given to them via video lecture material. Respondents preferred a resource that summarized the material and that showed how each topic could be applied via case examples. Although respondents did find the podcasts to be beneficial, they did not agree that they were more helpful than online, audio-video-based lectures or textbook resources. These findings indicate that podcasts are a beneficial supplementary resource in a DPT educational setting. Respondents also recommended reducing the length of each podcast to engage the listener and hold their attention. The average adult attention span is up to 30 minutes in length (Robson, 2010), and each podcast ranged from around 40 to 50 minutes, spanning outside of the normal range. In future podcast creation, modifying the length of each episode and condensing the

content would be other measures to consider when comparing usage versus educational benefit. The information in this study adds to the body of evidence in educational technology, by providing suggestions for quality improvement of podcasts if they are chosen as a tool to use in DPT classes.

Limitations

When considering transferability and generalizability of study findings into other settings, multiple limitations should be considered. This study utilized a self-report survey to gather data. Another limitation of this study is the use of a small sample in a hybrid DPT cohort, although a high participation rate was obtained. Due to the nature of the topic being studied, a convenience sample was most appropriate for gathering relevant data. These factors should be taken into consideration for educators who are contemplating the implementation of podcasts in their courses. Additionally, this study focused on student perception of podcasts as educational technology in a DPT curriculum. Although this was the only course in the degree plan that incorporated podcasts for the semester in which this course was taken, the sample in this study was in a hybrid model curriculum. These learners may already have a preference for virtual learning and have positive perceptions of specific educational technology like podcasts (Amir, 2020). Utilizing transcripts or closed captioning for hearing-impaired students would also need to be considered for inclusivity. Future research to assess the satisfaction of implementation in various curricular models will add value to the cumulative body of evidence on this topic and may direct the development of podcasts in future DPT curricula. Other measures could also be considered in future studies, such as determining how the inclusion of podcasts benefits learners beyond their first semester. This would allow researchers to explore longitudinally the influence of continued podcast usage on students' course grades and grade point averages. This study explored perceptions of the podcasts and explored resulting performance in the course, and similar mixed-methods studies may inform our educational practice in using this technology in the future.

Conclusion

This study describes the implementation of educational theory into a podcast for delivering content in a DPT course. The findings demonstrated that although DPT students report positive perceptions of accessibility and belief in the value of podcasts as a learning tool, there are enhancements that can be considered to improve the lived experience of using podcasts for learning. Respondents recommended continuing the practice of podcast administration for future cohorts and in their own upcoming curriculum. This indicated value in the educational benefit of the podcasts, including their use as a supplemental resource and review tool, their use in the application of lecture material, and their accessibility for learning on the go. There was some emerging evidence in this study that podcast usage may have an impact on examination performance, and this warrants further investigation. Based on these findings, educators in DPT programs are encouraged to incorporate podcasts into the curriculum to motivate student learning. It has been shown that DPT students are seeking easily accessible, on-the-go educational content that can be incorporated into their course planning needs. Overall, podcasts can be a beneficial supplementary resource for faculty to include in DPT coursework.

References

Alarcón, R., & Blanca, M. J. (2020). Development and psychometric properties of the questionnaire for assessing educational podcasts (QAEP). *Frontiers in Psychology*, *11*, Article 579454. https://doi.org/10.3389/fpsyg.2020.579454

Allen Moore, W., & Russell Smith, A. (2012). Effects of video podcasting on psychomotor and cognitive performance, attitudes and study behaviour of student physical therapists. *Innovations in Education and Teaching International*, *49*(4), 401–414. https://doi.org/10.1080/14703297.2012.728876

Amir, L. R., Tanti, I., Maharani, D. A., Wimardhani, Y. S., Julia, V, Sulijaya, B., Puspitawati R. (2020). Student perspective of classroom and distance learning during COVID-19 pandemic in the undergraduate dental study program Universitas Indonesia. *BMC Medical Education,* 20(392), 1–6. https://doi.org/10.1186/s12909-020-02312-0

Back, D. A., Von Malotky, J., Sostmann, K., Hube, R., Peters, H., & Hoff, E. (2017). Superior gain in knowledge by podcasts versus text-based learning in teaching orthopedics: A randomized controlled trial. *Journal of Surgical Education*, *74*(1), 154–160. https://doi.org/10.1016/j.jsurg.2016.07.008

Barnes, J., Carraway, C., & Jones, S. (2021). Using lecture podcasts in the COVID-19 transition to virtual post-secondary education in agriculture. *Natural Sciences Education*, *50*(2), Article e20064. https://doi.org/10.1002/nse2.20064

Bashir, A., Bashir, S., Rana, K., Lambert, P., & Vernallis, A. (2021). Post-Covid-19 adaptations; the shifts towards online learning, hybrid course delivery and the implications for biosciences courses in the higher education setting. *Frontiers in Education*, *6*, Article 711619. https://doi.org/10.3389/feduc.2021.711619

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp0630a

Briand, S., Malo-Leclerc, I., Beaudoin, M., Croisetière, É., Tremblay, A., Côté-Boulanger, M., & Carrier, A. (2021). Considerations in the use of podcasts for teaching and learning in occupational therapy: A scoping study. *Journal of Occupational Therapy Education*, *5*(2), Article 2. https://doi.org/10.26681/jote.2021.050202

Cho, D., Cosimini, M., & Espinoza, J. (2017). Podcasting in medical education: A review of the literature. *Korean Journal of Medical Education*, *29*(4), 229–239. https://doi.org/10.3946/kjme.2017.69

Cooper, A. Z., & Richards, J. B. (2017). Lectures for adult learners: Breaking old habits in graduate medical education. *The American Journal of Medicine*, *130*(3), 376–381. https://doi.org/10.1016/j.amjmed.2016.11.009

Greenberger, H. B., & Dispensa, M. (2015). Usage and perceived value of video podcasts by professional physical therapist students in learning orthopedic special tests. *Journal of Physical Therapy Education*, *29*(3), 46–57. https://doi.org/10.1097/00001416-201529030-00007

Johnson, L., & Grayden, S. (2006). Podcasts—Ein neues medium für digitale veröffentlichungen [Podcasts—An emerging form of digital publishing]. *International Journal of Computerized Dentistry*, 9(3), 205–218.

Kaplan, H., Verma, D., & Sargsyan, Z. (2020). What traditional lectures can learn from podcasts. *Journal of Graduate Medical Education*, *12*(3), 250–253. https://doi.org/10.4300/JGME-D-19-00619.1

Kay, R. H. (2012). Exploring the use of video podcasts in education: A comprehensive review of the literature. *Computers in Human Behavior*, *28*(3), 820–831. https://doi.org/10.1016/j.chb.2012.01.011

Kelly, J. M., Perseghin, A., Dow, A. W., Trivedi, S. P., Rodman, A., & Berk, J. (2022). Learning through listening: A scoping review of podcast use in medical education. *Academic Medicine*, *97*(7), 1079–1085. https://doi.org/10.1097/ACM.0000000000004565

Khechine, H., Lakhal, S., & Pascot, D. (2013). University students' perception of the pedagogical use of podcasts: A case study of an online information system course. *Journal of Education and Training Studies*, *1*(2), 136–151. https://doi.org/10.11114/jets.v1i2.139

Kumar Basak, S., Wotto, M., & Bélanger, P. (2018). E-learning, M-learning and D-learning: Conceptual definition and comparative analysis. *E-Learning and Digital Media*, *15*(4), 191–216. https://doi.org/10.1177/2042753018785180

Loomes, M., Shafarenko, A., & Loomes, M. (2002). Teaching mathematical explanation through audiographic technology. *Computers & Education*, *38*(1–3), 137–149. https://doi.org/10.1016/S0360-1315(01)00083-5

Mayer, R. E. (2014). Cognitive theory of multimedia learning. In R. E. Mayer (Ed.), *The Cambridge Handbook of Multimedia Learning* (2nd ed., pp. 43–71). Cambridge University Press.

Minter, D. J., Geha, R., Manesh, R., & Dhaliwal, G. (2021). The future comes early for medical educators. *Journal of General Internal Medicine*, *36*(5), 1400–1403. https://doi.org/10.1007/s11606-020-06128-y

Newton, P. M., & Salvi, A. (2020). How common is belief in the learning styles neuromyth, and does it matter?: A pragmatic systematic review. *Frontiers in Education*, *5*, Article 602451. https://doi.org/10.3389/feduc.2020.602451

Ng, L., Seow, K. C., MacDonald, L., Correia, C., Reubenson, A., Gardner, P., Spence, A. L., Bunzli, S., & De Oliveira, B. I. R. (2021). eLearning in physical therapy: Lessons learned from transitioning a professional education program to full elearning during the COVID-19 pandemic. *Physical Therapy*, *101*(4), Article pzab082. https://doi.org/10.1093/ptj/pzab082

Prakash, S. S., Muthuraman, N., & Anand, R. (2017). Short-duration podcasts as a supplementary learning tool: Perceptions of medical students and impact on assessment performance. *BMC Medical Education*, *17*, Article 167. https://doi.org/10.1186/s12909-017-1001-5

Riddell, J., Robins, L., Sherbino, J., Brown, A., & Ilgen, J. (2021). Residents' perceptions of effective features of educational podcasts. *Western Journal of Emergency Medicine: Integrating Emergency Care With Population Health*, *22*(1), 26–31. https://doi.org/10.5811/westjem.2020.10.49135

Riddell, J., Swaminathan, A., Lee, M., Mohamed, A., Rogers, R., & Rezaie, S. (2017). A survey of emergency medicine residents' use of educational podcasts. *Western Journal of Emergency Medicine: Integrating Emergency Care With Population Health*, *18*(2), 229–234. https://doi.org/10.5811/westjem.2016.12.32850

Robson, N., & Greensmith, J. (2010). Educational podcasts: Some early evidence and thoughts. *The International Journal of Management Education*, *8*(3), 107–117.

Rossettini, G., Geri, T., Turolla, A., Viceconti, A., Scumà, C., Mirandola, M., Dell'Isola, A., Gianola, S., Maselli, F., & Palese, A. (2021). Online teaching in physiotherapy education during COVID-19 pandemic in Italy: A retrospective case-control study on students' satisfaction and performance. *BMC Medical Education*, *21*(1), Article 456. https://doi.org/10.1186/s12909-021-02896-1

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